

Financial Stability Report

2018:1



S V E R I G E S R I K S B A N K

Correction in the Financial Stability Report regarding the accessible format of the report

In the Financial Stability Report published on 23 May 2018, it was incorrectly stated that a printed version of the report could be ordered free of charge. This is no longer the case and the report is only accessible on the Riksbank's website ([riksbank.se](https://www.riksbank.se)) where it can be downloaded in PDF format.

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 9 and 22 May 2018. The report takes into account developments up to and including 16 May 2018. The report is available on Sveriges Riksbank's website, www.riksbank.se. It is also possible to order a printed version of the report free of charge on the website, or to download the report as a PDF.

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 Finansinspektionen (the Swedish financial supervisory authority), the Ministry of Finance and the Swedish National Debt Office. The Ministry of Finance is responsible for the regulation of financial enterprises and Finansinspektionen is responsible for supervision. 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 enterprises 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 risks leading to 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 arise 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 large percentage of the costs of a financial crisis fall to others both within and outside the financial system. If a crisis occurs, the government also 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 threaten financial and macroeconomic stability. The main focus of the analysis is on the Swedish banks 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, or at legislators and other authorities.

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SUMMARY

Economic and political uncertainty abroad poses risks

Economic activity abroad is developing strongly and the economic upswing is expected to continue in the years ahead. As before, however, there are a number of international risks linked to economic and political uncertainty, which, if they materialise, may lead to weaker economic development. Sweden is a small, open economy with considerable foreign trade and a financial system that is strongly dependent on international financial markets. Economic and political uncertainty abroad thereby poses risks to Swedish macroeconomic and financial stability.

Uncertainty exists, for example, surrounding to the economic effects of the United Kingdom's exit from the EU. There are also several structural problems in the euro area, for instance, regarding the banking sector and weak public finances in several countries. Furthermore, there is still unease about protectionism and the spread of possible counter-measures with regard to trade tariffs announced by the United States and China. Another source of uncertainty linked to the US economy is that the expansionary fiscal policy risks threatening the sustainability of public finances, which in a bad scenario can lead to sharply rising interest rates, large fluctuations in the USD exchange rate and substantially lower growth.

Households' high indebtedness poses the greatest risk

Swedish households are currently highly indebted, in both a historical and an international perspective. Indebtedness has been increasing for a long time, hand in hand with sharply rising housing prices. Since the autumn, housing prices have fallen, while Swedish households' debts have continued to increase faster than their incomes. The downturn seems to be due to a rapidly increased supply of housing, primarily within the more expensive segment. An increased supply and a slower rate of price growth than what has been the case in recent years are expected to lead to calmer development in the housing market and slower growth in household debt, which is a desirable outcome. At the same time, there is great uncertainty around the development of prices on the housing market, and a greater price fall cannot be ruled out. A substantial and more lasting price fall may lead to serious consequences for both macroeconomic and financial stability.

It is the Riksbank's assessment that the high and growing household indebtedness continues to pose the greatest risk to the Swedish economy. The high indebtedness is due, among other things, to a poorly functioning housing market and to the tax system not being well designed from the perspective of financial stability. It is

therefore important to continue with measures to reduce risks and increase resilience in the household sector, above all within these policy areas.

Structural vulnerabilities in today's banking system

The four major Swedish banks continue to report good profitability. But the Riksbank has been highlighting several vulnerabilities and risks linked to the Swedish banking system for a long time, including its size, concentration, interconnectedness, limited capital levels and low resilience to liquidity risks. Their considerable exposure towards the housing sector and recent developments on the housing market contribute to increase the vulnerabilities. Loans to Swedish households and companies with housing and other types of property as collateral have, for example, increased and constitute just under 80 per cent of the major banks' total lending, 70 per cent of which is loans to households for housing purposes.

In light of the vulnerabilities and the risks to which the banks are exposed, it is important that there is sufficient capital. The Riksbank considers that a non-risk-weighted capital requirement, in the form of a leverage ratio requirement, should be introduced as soon as possible for the major Swedish banks as a complement to the risk-weighted capital requirements, which have certain flaws. A leverage ratio requirement ensures that banks hold a certain volume of loss-absorbing capital in relation to their total assets. The assessment is that the requirement should be set at 5 per cent.

As regards the banks' liquidity risks, the Riksbank considers it important that the banks have their own self-insurance by holding adequate liquidity reserves so that they can manage the liquidity risks they take in their operations. Requirements should therefore be placed on Swedish banks' liquidity coverage ratio (LCR), in Swedish krona and in all other significant currencies.

A relocation of Nordea affects the financial stability risks

In September 2017, the Board of Directors of Nordea Bank AB took the decision to move the parent company to Finland and thereby to the banking union. If the relocation is implemented, consequences arise for the Swedish financial system and for Swedish financial stability. The Swedish banking system's assets would amount to around 300 per cent of GDP. The corresponding figure at present is around 400 per cent. Nordea will continue to be active in Sweden as a bank branch and through the five existing subsidiaries. The banking system remains to be large, concentrated and interconnected.

At the same time, such a relocation would reduce Sweden's responsibility for Nordea, as well as its control of and oversight into the bank. In the long run, when the banking union is fully completed, more intensive supervision and increased risk diversification among the countries in the union may lead to lower risks for Sweden. However, the banking union is not fully developed and a substantial part of the responsibility for managing banking problems within the banking union still lies with the individual member state.

The Riksbank's overall assessment is that the risks to financial stability will increase in the near term, which is why the Riksbank considers it to be a precondition of the relocation that Nordea's capital and liquidity requirements are not reduced.

Furthermore, increased cooperation and the exchange of information between the Nordic countries in terms of supervision and liquidity supply continues to be very important.

Elevated risks in the financial infrastructure

The Riksbank's oversight of the financial infrastructure shows that it works well at present, which is to say that availability is good.

Over the past year, financial market infrastructures (FMIs) have implemented measures to increase their resilience to shocks. But it is the Riksbank's assessment that the operational risk in the financial infrastructure is elevated due to the risk of adverse events such as cyber-attacks. It will also be elevated until Euroclear Sweden's system for securities settlement has been adapted to the EU's new requirements placed on central securities depositories and until the system has also been adapted so that making changes to it does not pose major risks.

Another risk is linked to the central counterparties' buffers for use under financial stress. If, for some reason, these buffers are reduced, there is a requirement that they shall be refilled within a certain period of time. At present, this is not assessed to be done sufficiently fast.

The Riksbank's assessment is also that there are particular risks and vulnerabilities as important participants are closely interlinked. It is therefore urgent to carefully monitor developments in this area and the implications it may have for financial stability.

Mortgages are a profitable product, attracting new operators

The development of the financial sector over the last year has been characterised by changes in the loan market. The fact that mortgages are a profitable product has made it particularly attractive for new operators to challenge the major banks by finding alternative models for lending. The major Swedish banks' margins on mortgages are on

historically high levels while the banks have increased their lending for housing purposes.

Technological development has lowered entry barriers

Technological development has made it easier for new players to enter the loan market, both for mortgages and consumption loans. For example, digitalisation has led to lower costs for lending, which has reduced the disadvantage that smaller players previously had against larger players with economies of scale. Digitalisation has also reduced the costs of searching and negotiating for borrowers. The implementation of certain legislative changes has also facilitated the entry of new mortgage players into the mortgage market. All in all, transparency and competition has increased on the market.

Stability risks may be reduced when competition on the mortgage market increases

The new mortgage players are small at present, but may grow and also increase in number in the future. This means, among other things, that the competition on the lending market continues to increase. This is deemed to be positive for financial stability as it would reduce concentration risks on the loan markets, for example. Assuming that mortgages among the new players are funded over longer durations, liquidity risks may also be reduced. Experiences in other countries show that new players can exert downward pressure on mortgage rates, particularly within segments with longer interest-rate fixation periods. Lower interest rates for loans with longer interest-rate fixation periods could reduce the high proportion of mortgages with variable interest rates, thereby making households less sensitive to unexpected increases in interest rates.

New players mean new risks and challenges

At the same time as the new players can be expected to have a certain positive effect on financial stability, they also bring new risks and challenges to stability. These new non-banking institutions' business models are currently non-standardised. It is therefore possible that some of these new players may start competing with less strict credit terms or create products that increase rather than decrease liquidity risks in the system. Neither have the new business models been tested in a declining mortgage market. There is a risk that these businesses are less able to manage non-performing mortgage loans than traditional banks with experience of economic downturns. It also remains to be seen how they cope with periods in which institutional investors' willingness to invest in mortgage loans decreases. The new players do not have the same access to the central bank's liquidity facilities that the banks have. It is also of central importance that all future mortgages, regardless of

lender, are covered by a thorough credit assessment and by current and future relevant macroprudential regulation.

The increase in loans for consumption is driven in part by smaller banks with a larger proportion of non-performing loans. These players may thus pose risks that are difficult to assess beforehand. It is therefore important to continue to follow the development of these players.

CHAPTER 1 – Assessment of the current situation

Economic activity abroad is developing strongly and the economic upturn is expected to continue in the coming years, but there is considerable uncertainty and the risk of weaker economic development. Economic activity is also strong in Sweden and is expected to remain so over the coming years. As housing prices have fallen slightly since the start of the autumn, domestic demand, above all in the form of housing investment, has softened. Internationally, equity prices have fallen and interest rates have risen since January, among other things due to expectations of higher policy rates and political uncertainty regarding trade agreements, for example.

Good economic outlook in an uncertain world

Economic activity abroad has continued to develop stronger than expected since November, when the last Financial Stability Report was published. However, there is some uncertainty linked to international developments, including structural problems in the European banking sector and weak public finances in a number of countries (see Chapter 2).

Economic activity is also strong in Sweden and is expected to remain so over the coming years.¹ However, growth is expected to be slightly restrained due to the weak development of prices on the housing market, which is expected to lead to a decrease in housing investment.

Valuations on equity markets, both in Sweden and internationally, are at approximately the same levels as in the autumn (see Chart 1:1). Equity prices fell at the end of January, partly due to expectations of higher policy rates but also due to political uncertainty regarding various trade agreements, for example. Recently, however, equity markets have recovered both in Sweden and internationally. The Swedish krona has depreciated since the start of the year. The Riksbank assesses that most of the weakening is due to changes in expectations of monetary policy, together with unease and volatility in financial markets.

Since the autumn, long-term government bond yields have risen internationally, particularly since the start of the year, due to expectations of higher policy rates. Recently, however, government bond yields internationally have fallen slightly, especially in Sweden and Europe while continuing to increase in the United States.

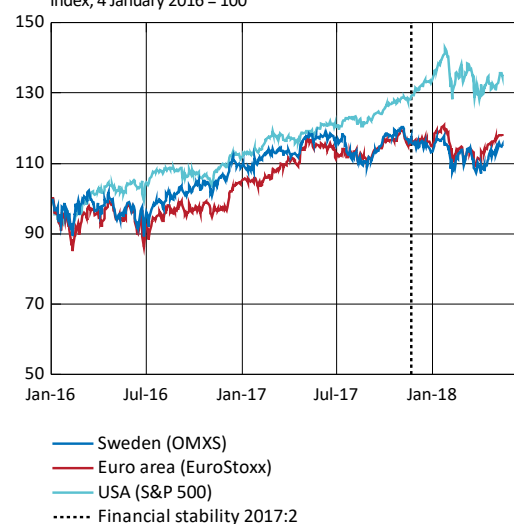
Continued expansionary monetary policy

In several countries, monetary policy has been markedly expansionary for a long time. However, a gradual normalisation of monetary policy has been initiated in the United States.

The Riksbank's assessment is that slow repo rate rises will not be initiated until the end of the year and that the repo

Chart 1:1. Stock market movements

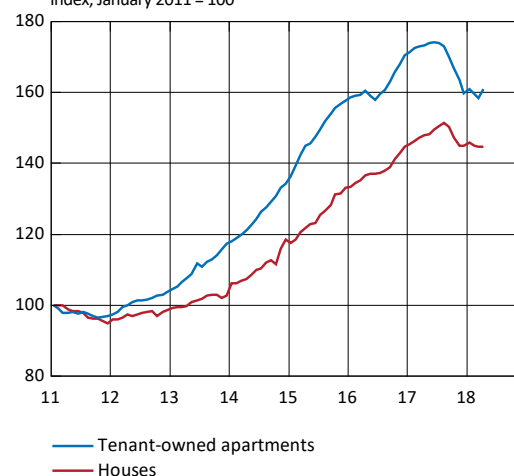
Index, 4 January 2016 = 100



Sources: Macrobond and Thomson Reuters

Chart 1:2. Housing prices in Sweden

Index, January 2011 = 100



Note. Housing prices are seasonally-adjusted.

Sources: Valueguard and the Riksbank

¹ Monetary Policy Report, April 2018. Sveriges Riksbank.

rate will be raised by about 1.5 percentage points over the coming three years. Monetary policy is hence expected to be expansionary for a longer period and to provide continued support to economic activity.

In December 2017, the decision was taken to reinvest bonds that mature in 2019 as early as during 2018. This has meant that the Riksbank has continued to purchase bonds at approximately the same rate as the Swedish National Debt Office issues them. The volume of bonds available for trading on the markets has continued to decrease slightly. The Riksbank carefully tracks how the government bond market and adjacent markets are functioning. Market agents say that it now takes longer to trade large blocks of government bonds than it did a number of years ago but that the functioning of the market has not changed significantly compared to one year ago. The overall assessment is that the Riksbank's continued bond purchases have not had any significant impact on the functioning of the market.

Housing prices have fallen but are expected to stabilise

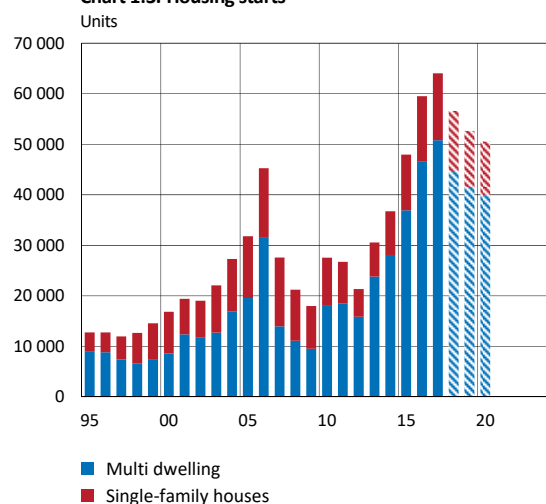
The fall in housing prices began at the start of the autumn after many years of substantial price rises (see Chart 1:2). According to the aggregate price index HOX, prices have fallen by 5.7 per cent compared with their peak in August. Above all, it is prices for tenant-owned apartments that have fallen. In April, prices had fallen with 7.2 per cent, at an annual growth rate. The corresponding figure for detached and semi-detached houses was a fall of 2.3 per cent. The decline in prices is greatest in Stockholm, where prices for tenant-owned apartments have fallen by 8.5 per cent and for detached and semi-detached houses by 8.2 per cent.

One probable reason for the fall in housing prices is that housing construction has been extensive in recent years (see Chart 1:3). In 2017, construction was started of about 64,000 homes, circa 51,000 of which were homes in multi-dwelling blocks. The rapid increase in housing construction in recent years has also led to a rapid increase in the supply of housing for sale. On the other hand, the turnover of housing has not increased to a corresponding extent, which may thus provide an explanation for the falling housing prices (see Chart 1:4).

Credit growth among households and companies continues to be high

Credit growth among households continues to be high (see Chart 1:5). Since mid-2017, the annual rate of growth in lending to households has been relatively stable at around 7 per cent. The rate of growth for consumption loans also continues to be high, albeit slightly lower than in the autumn, with annual growth of 7.4 per cent in March.² Lending to households largely consists of loans with tenant-owned

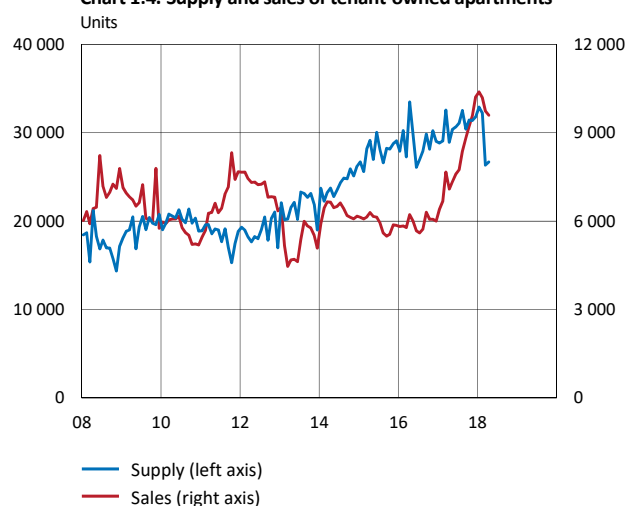
Chart 1:3. Housing starts



Note. The figures represent new builds excluding conversions and have been adjusted for the time delay in reporting for 2016. Striped bars represent the Riksbank's forecast.

Sources: Statistics Sweden and the Riksbank

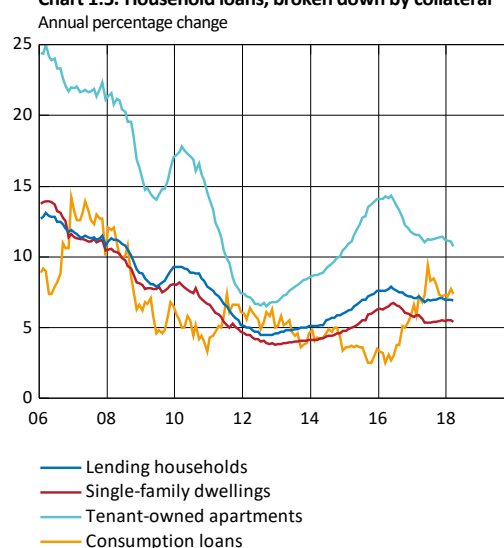
Chart 1:4. Supply and sales of tenant-owned apartments



Note. Refers to seasonally-adjusted series. Supply of tenant-owned housing comprises the number of advertisements during the month on the residential property trading website, Hemnet. Sales comprise the number of reported sales according to the independent housing price statistics supplier, Mäklarstatistik.

Sources: Hemnet, Mäklarstatistik and the Riksbank

Chart 1:5. Household loans, broken down by collateral



Note. MFIs' lending to households and consumption loans have been adjusted for reclassifications and traded loans.

Source: Statistics Sweden

² Van Santen, P. (2017), Drivers and implications of the strong growth in consumption loans, *Staff memo*, December 2017. Sveriges Riksbank.

apartments and single-family houses as collateral. Mortgage loans currently account for around 80 per cent of total household debt. Consumption loans make up about 5 per cent of total household debt, but account for 13 per cent of interest expenses as interest rates are generally higher for consumption loans than for mortgages.³ Household debt in relation to disposable incomes continues to rise and now exceeds 185 per cent.

The banks' lending to companies has risen since the end of last year and the annual rate in March was 6.2 per cent, which is higher than the average growth rate of 4.6 per cent in 2017 (see Chart 1:6). Bank loans still form the primary source of funding for Swedish companies, even if securities borrowing is increasing and now corresponds to about one-third of total corporate borrowing. In March, securities borrowing increased by 15 per cent at an annual rate, compared with an average of 18.3 per cent in 2017. The average maturity for this borrowing is just over five years.⁴ The conditions for households and companies to obtain credit are expected to remain favourable.

Major banks showing good profitability

The positive economic development and continued expansive monetary policy have contributed towards the banks' funding costs developing favourably. The major Swedish banks' margins on mortgages continue to be at historically high levels.⁵ The banks' revenues from advisory services and transaction fees have also increased. Their costs and loan credit losses continue to be low. All in all, this has led to the major Swedish banks continuing to report high returns on equity (see Chart 1:7).

Good availability in the financial infrastructure

The Riksbank's oversight shows that the systems in the financial infrastructure continue to be secure and efficient. The four Swedish systems that the Riksbank oversees all had good availability in 2017 (see Chart 1:8) and at the start of 2018. This means that it has been possible to execute payments and securities transactions on time. However, in April, Nasdaq was impacted by an interruption in availability due to a fire alarm in its server hall. The system was not available for about five hours, which is more than the two hours that shall not be exceeded under law and under CPMI-IOSCO's principles. The causes of the incident and the reason why it took so long before the system was available again need to be analysed. Based on the analysis, Nasdaq Clearing needs to implement measures to prevent such long interruptions from reoccurring. The Riksbank takes a serious view of this incident, even if it had no consequences for financial stability.

³ The average interest rate is 4.8 per cent for consumption loans and 1.7 per cent for mortgages.

⁴ Average maturity refers to the volume-weighted mean value of the remaining time to maturity.

⁵ The banks' margins on mortgages, fourth quarter 2017. Finansinspektionen.

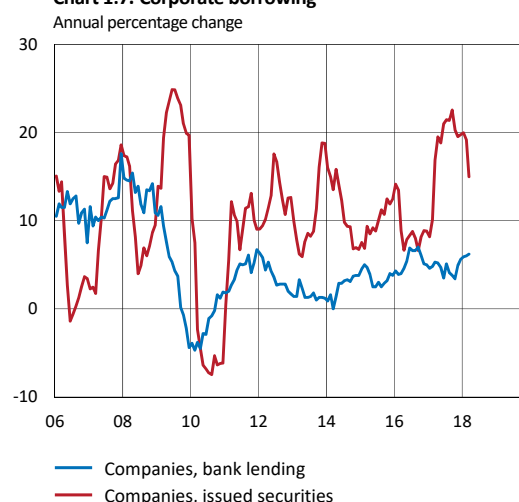
Chart 1:6. Return on equity



Note. Unweighted average. The red line represents a sample of European banks.

Sources: SNL Financial and the Riksbank

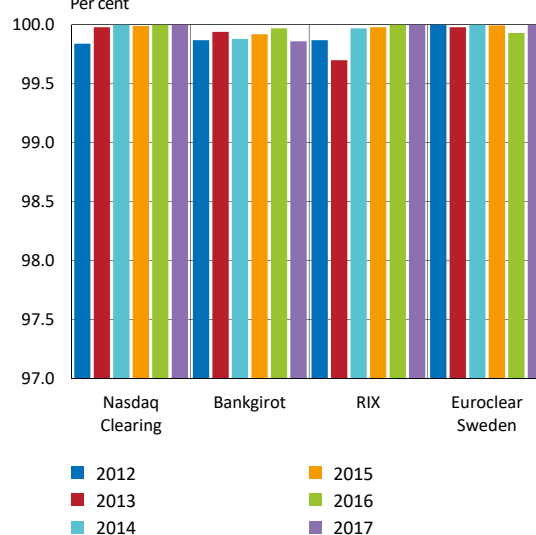
Chart 1:7. Corporate borrowing



Note. The growth rate for issued securities has been currency adjusted.

Sources: Statistics Sweden and the Riksbank

Chart 1:8. Availability of the Swedish infrastructure systems



Note. 100 per cent means that the system has been available 100 per cent of the time. The chart covers developments until 2017 and therefore the interruption in Nasdaq Clearing in April 2018 is not included.

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

CHAPTER 2 – Vulnerabilities and risks in the financial system

High household indebtedness and the considerable exposure of banks to the poorly functioning housing market make the Swedish financial system vulnerable and sensitive to shocks. The structure of the banking system, banks' limited capital levels and their low resilience to liquidity risks also contribute to this vulnerability. Stability risks may, however, diminish in the long run if competition on the mortgage market increases. Nordea's relocation and a fully developed banking union may lead to reduced risks, but the risks to financial stability will increase slightly in the short term. The Riksbank therefore deems that a precondition for a move is that capital and liquidity requirements will not be lower, and that there continues to be increased cooperation and information exchange between the Nordic countries. Risks linked to international developments remain, including geopolitical uncertainty and rising bond yields in the United States.

Vulnerabilities and risks linked to household indebtedness

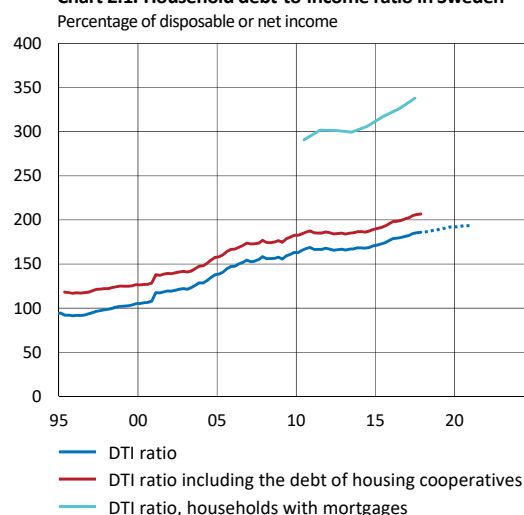
It is the Riksbank's assessment that the high household indebtedness continues to pose the greatest risk to the Swedish economy. There is broad consensus in Sweden regarding this risk, which has also been highlighted by international bodies such as the International Monetary Fund (IMF), the Organisation for Economic Cooperation and Development (OECD), the European Commission and the European Systemic Risk Board (ESRB).⁶

Households continue to be highly indebted

Swedish household indebtedness has been increasing for a long time. The aggregate debt-to-income ratio (household debt in relation to their disposable income) for the entire household sector is currently over 185 per cent (see Chart 2:1). The Riksbank's credit data on the stock of mortgage borrowers shows that households with mortgages had an average debt-to-income ratio of 338 per cent in September 2017, which is an increase of 36 percentage points compared to 2011 (see Chart 2:1 and Chart 2:2).⁷ The same data also shows that 31 per cent of households with mortgages (640,000) have a debt-to-income ratio exceeding 400 per cent and 13 per cent (260,000) have a debt-to-income ratio exceeding 600 per cent. Since 2011, debt-to-income ratios have increased in all income groups.

According to Finansinspektionen's (FI) Mortgage Survey, the debt-to-income ratio among new mortgage borrowers has also increased, from 402 per cent in 2016 to 411 per cent

Chart 2:1. Household debt-to-income ratio in Sweden



Note. Debt-to-income (DTI) ratio refers to total debt as percentage of disposable income. The broken line represents the Riksbank's forecast. Prior to September 2010, housing cooperative debt has been calculated based on loans to mortgage institutions. The DTI ratio for only households with mortgages is an average and based on total household debt (excluding student loans) divided by their net income.

Sources: Statistics Sweden and the Riksbank

⁶ *Country Report Sweden*, March 2018. European Commission *Stability in the financial system 2017:2*. Finansinspektionen and *Financial System Stability Assessment Sweden*, October 2016. International Monetary Fund (IMF).

⁷ Blom, K. and van Santen, P. (2017), *Household indebtedness in Sweden – update for 2017*, *Economic Commentary* No. 6. Sveriges Riksbank.

in 2017.⁸ At the same time, the Mortgage Survey shows that the average loan-to-value ratio (mortgage in relation to value of the home) was 63 per cent among new mortgage borrowers and 55 per cent in the stock of mortgages.

Looking at the distribution of debt across age groups, it is clear that older mortgage borrowers have increased their debt to a greater extent than younger ones, and debt among the over-65s has more than doubled between 2010 and 2017 (see Chart 2:3). The increase is due to more older people now being in this age group and more people in the group having a mortgage, but most of all to existing mortgage holders borrowing more against their existing home, which has probably increased in value. The increase in debt-to-income ratio among older borrowers means that their resilience has weakened. The increase in indebtedness among older people may also entail greater risks than an increase in indebtedness among younger people. This is because the value of future incomes is higher for a younger person than it is for an older person.

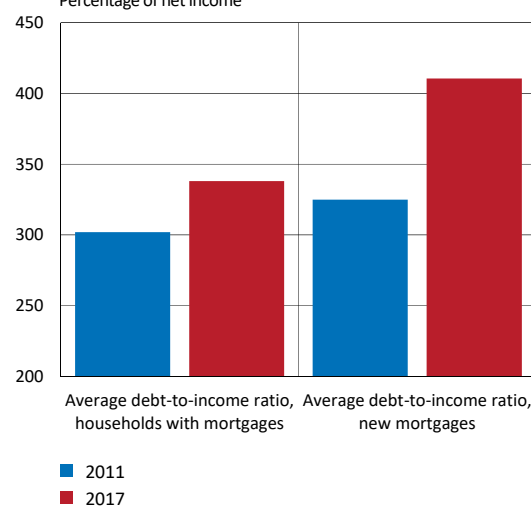
Double risks for households who live in tenant-owned housing

In addition to their bank loans, many households also have indirect debts in the form of loans taken out by their housing cooperatives, whose interest expenses and amortisations are partly reflected in the cooperative's monthly fees. Total housing cooperative debt has risen by 41 per cent since 2010 and currently amounts to SEK 465 billion. The annual rate of growth for lending to housing cooperatives was just over 8.7 per cent in March (see Chart 2:4). The aggregate debt-to-income ratio for households including loans via housing cooperatives amounts to just over 205 per cent (see Chart 2:1). Newly formed housing cooperatives generally have higher debt per square metre than older housing cooperatives. On average, a newly formed housing cooperative had approximately SEK 11,500 of debt per square metre in 2017.⁹ The regional differences in indebtedness per square metre among newly formed housing cooperatives are marginal, but housing cooperatives in the metropolitan areas have on average higher debt than those in the rest of the country. In addition, statistics from the FI Mortgage Survey also show that the most highly indebted households tend to live in the most highly indebted housing cooperatives (see Chart 2:5).

Debt-to-income ratio expected to rise in the period ahead

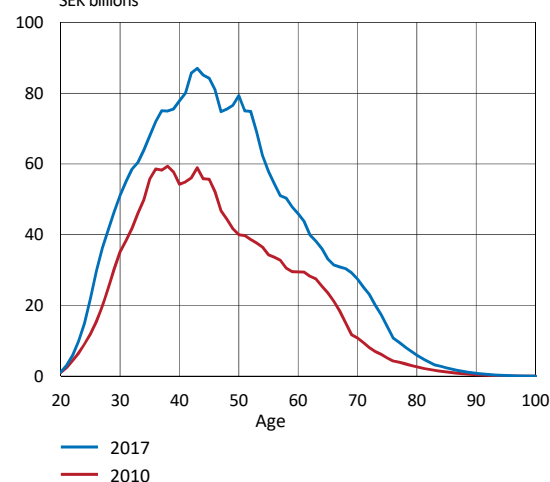
According to the Riksbank's forecast, household debt is expected to grow more rapidly than their disposable income and the aggregate debt-to-income ratio is expected to rise to just over 190 per cent in 2021.¹⁰ The expectation that the

Chart 2:2. Households' debt-to-income ratio
Percentage of net income



Sources: Finansinspektionen and the Riksbank

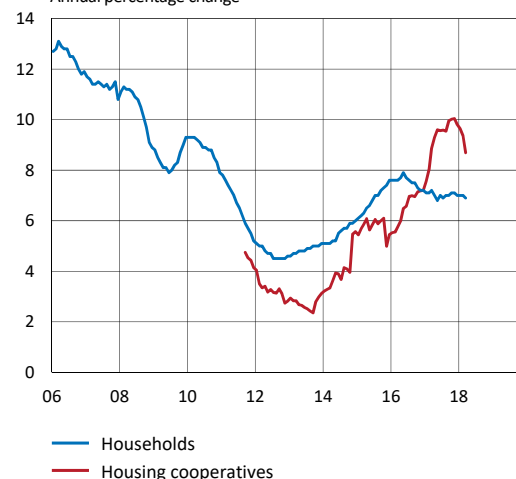
Chart 2:3. Household debt by age
SEK billions



Note. Data refer to mortgage borrowers' total debt.

Source: The Riksbank

Chart 2:4. Lending to households and housing cooperatives
Annual percentage change



Note. Refers to loans from monetary financial institutions (MFI).

Sources: Statistics Sweden and the Riksbank

⁸ The Swedish mortgage market 2018. Finansinspektionen.

⁹ The Swedish mortgage market 2018. Finansinspektionen.

¹⁰ Monetary Policy Report, April 2018. Sveriges Riksbank.

debt-to-income ratio will continue to rise is in part due to a home-buyer today paying on average a significantly higher price than paid by previous buyers. The loans taken out to fund housing purchases today can therefore be expected to be larger than an average mortgage among existing homeowners, where the size of the loan depends on what they in turn paid for the home and the new loans they have taken to, for example, carry out refurbishments. The turnover of homes will thereby contribute to a rise in total household debt. As new construction is on a historically high level, the number of homeowners with mortgages will also rise comparatively quickly.

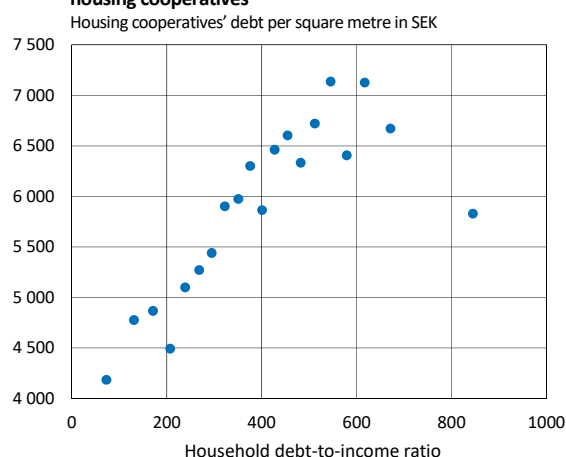
The high indebtedness makes households sensitive to shocks and poses risks to the Swedish economy

Despite the high level of debt among households, the low interest rates have resulted in their housing expenses and interest-to-income ratios (their interest expenditure in relation to their disposable income) currently being low (see Chart 2:6). The interest-to-income ratio in December was just over 2.5 per cent for the aggregated household sector. For those households that are actually in debt, the interest-to-income ratio amounts to around four per cent.

On the aggregated level, households also have relatively high savings and substantial assets. However, since 2007, there is no information on how assets and savings are distributed among households, and consequently neither on how much savings the most indebted households have. Better information on household wealth is something that the Riksbank has been requesting for a long time.¹¹ There are indications that the most highly indebted households have significantly fewer liquid assets in relation to their income than households who are less indebted. 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. The fact that 69 per cent of the mortgage stock and 71 per cent of new mortgages are variable-rate exacerbates this sensitivity. This means that a majority of households could be rapidly affected by rising interest rates. Interest rates and interest-to-income ratios are expected to remain low in the years ahead. But if interest rates rise to more normal levels, it may have a major impact on households' interest expenditure, especially for highly-indebted households.¹² In one scenario in which the interest rate at the end of the Riksbank's forecast rises by a further 3 percentage points, the interest-to-income ratio may reach double the current level (see Chart 2:6).

Housing cooperatives also have a certain percentage of loans at variable interest rates, which means that households

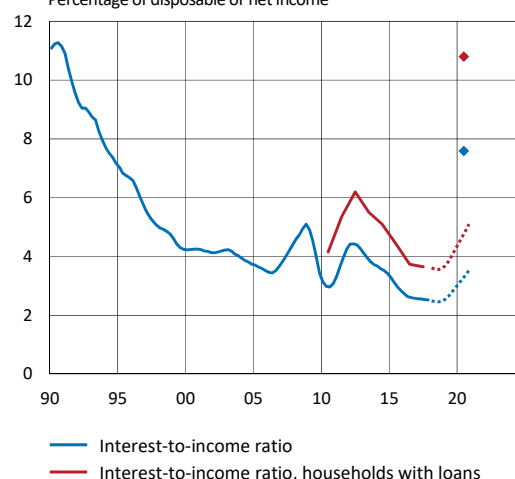
Chart 2:5. Highly indebted households live in highly indebted housing cooperatives



Note. Data refers to autumn 2017. The observations are grouped on the basis of the households' debt-to-income ratios, so that each point in the Chart consists of up to 360 households. After this, the average debt per square metre of the housing cooperative is calculated, as is the average debt-to-income ratio for each group.

Sources: Finansinspektionen and the Riksbank

Chart 2:6. Households' interest-to-income ratio
Percentage of disposable or net income



Note. The blue line indicates interest expenditure as a percentage of disposable income and the broken blue line refers to the Riksbank's forecast. The interest-to-income ratio for households with loans is calculated based on individually specific data on net household income and debt. The broken red line shows how the interest-to-income ratio for households with loans would develop under the assumption that it follows the same trend as the broken blue line. The rhombuses illustrate a stressed scenario in which interest rates at the end of the forecast period rise by three percentage points more than predicted in the forecast. Interest expenses are adjusted for tax relief.

Sources: Statistics Sweden and the Riksbank

¹¹ The Riksbank's proposal for new statistics on households' financial assets and liabilities, October 2017. Sveriges Riksbank.

¹² Household indebtedness and interest rate sensitivity. Article in *Financial Stability Report* 2017:2. Sveriges Riksbank.

who own tenant-owned housing can be even more affected by rising interest rates. For example, a rate rise of 5 percentage points would mean an increase in monthly costs of almost SEK 2,000 for a 70-square-metre apartment, if the loans in the cooperative are variable-rate and the cooperative passes on the increased costs directly to its members in its monthly fees.¹³ For a household with a loan of SEK 1.5 million, their mortgage payments increase by just over SEK 4,000 under the same circumstances.¹⁴ If the cooperative has to increase its fees to service its bank loans, the household may not only have to pay higher monthly fees but also have higher interest expenses for its own bank loan.

Risks in the housing market

The Riksbank has been warning about the risks associated with the poorly functioning housing market and high housing prices for a long time. The Riksbank has therefore pointed out the need for structural measures to attain long-term sustainable development on the housing market.

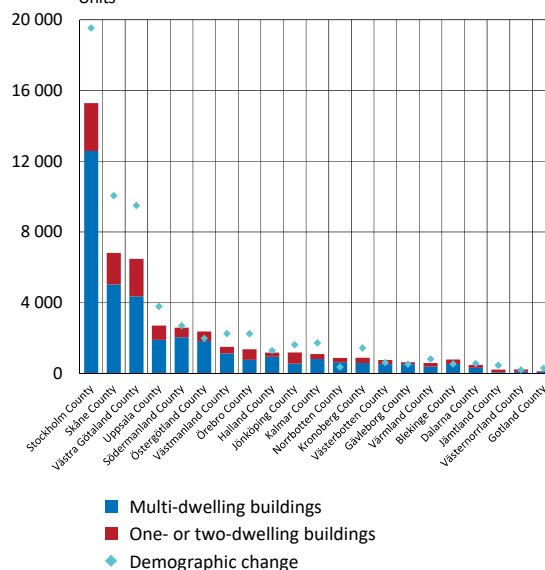
Weak price growth in the housing market since the autumn

The high and rising level of indebtedness has coincided with sharply rising housing prices.¹⁵ Since 2005, housing prices have more than doubled. The fact that housing prices have been rising rapidly for a long period of time and that homes are highly valued in an historical perspective is explained in part by structural factors, such as an imbalance between supply and demand for housing, rising real wages, falling interest rates and lower taxes, which have increased disposable household income. The Riksbank has been highlighting the risks inherent in the rapid price growth for a long time.

In the autumn, however, housing prices began to fall and the decline continued at the beginning of 2018. The decline has been greatest for tenant-owned homes, particularly in Stockholm. The decline is probably linked to the increased supply of newly constructed tenant-owned homes, as price growth has been weakest in those regions where construction is highest. It is in these regions, however, that population growth has also been greatest (see Chart 2:7).

It also appear that smaller apartments are being built, which is in line with the existing need. Just under 90 per cent of the completed homes were apartments of 1-3 rooms (see Chart 2:8). Thus, the decline seems instead to be due to newly built housing being too expensive in relation to demand. It is also possible that the amortisation requirements

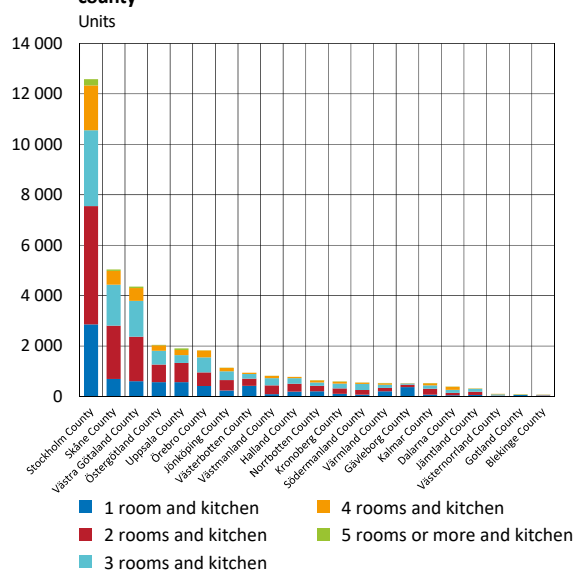
Chart 2:7. Completed homes per county and demographic change
Units



Note. Demographic change is defined as population multiplied by 0.5. Data refers to 2017.

Sources: Statistics Sweden and the Riksbank

Chart 2:8. Completed apartments in multi-dwelling blocks per county
Units



Note. Data refers to 2017.

Sources: Statistics Sweden and the Riksbank

¹³ Lidberg, A. (2018), Housing cooperatives and financial stability, *Economic Commentary* No. 4. Sveriges Riksbank.

¹⁴ Flodén, M., Kilström, M. Sigurdsson, J. and Vestman, R. (2016), Household debt and monetary policy: revealing the cash-flow channel. *Swedish House of Finance Research Paper* No. 16-8.

¹⁵ In a number of other countries, too, housing prices and indebtedness have risen sharply, for instance in Australia, Canada, New Zealand and Norway.

may have pushed prices down slightly, especially in Stockholm where debt-to-income ratios are highest.

Uncertainty surrounding developments in the housing market

The Riksbank has previously pointed out that construction has not been keeping pace with the long-term demand for housing for many years, thereby contributing to the price growth. The Swedish National Board of Housing, Building and Planning (Boverket) also assesses there to be a major need for housing as a result of the sharp population growth, and the recent increases in supply are therefore a positive trend.

According to the Riksbank's assessment, the past autumn's price fall will lead to reduced housing investment. As it takes time to complete an initiated housing project and many housing construction projects are now under way, however, the supply of newly built tenant-owned homes is expected to remain high for some time to come (see Chart 1:3 in Chapter 1).

In the Riksbank's forecast, housing prices are set to stabilise in 2018 before then rising slightly in the following years. An increased supply and slower rate of price growth than has been the case in recent years are expected to lead to a more stable development in the housing market and slower growth in household debt, which is a desirable outcome. But the forecast also implies that the problems in the housing market will remain, and that it will be difficult to achieve the number of homes in Boverket's assessment of housing need. Structural measures that increase mobility in the housing market and rationalise the use of the existing stock, for example, are therefore still important (see Chapter 3).

Uncertainty over price developments in the housing market is, however, considerable and a greater price fall cannot be ruled out. This could occur if, for example, the number of homes being built proves not to fully correspond to the demand due to a majority of construction companies and households having the wrong expectations about price developments and their debt-servicing ability.¹⁶ It is important for households and construction companies to have reasonable expectations about future housing costs as a gradual normalisation of monetary policy is expected to lead to higher interest expenditure. A sharper price fall than the one that has occurred so far could have serious consequences for both macro-economic and financial stability (see the fact box "The

The risks associated with household debt and the housing market can spread to the rest of the economy

Even if households can comfortably manage to keep up with their mortgage payments, as measures such as FI's stress tests on new mortgage borrowers show, the high level of indebtedness can be particularly problematic if economic development were to be much worse than expected. Highly-indebted households may then significantly reduce their consumption, particularly if housing prices also start to fall.¹⁶ If consumption falls, growth and unemployment will be affected and general economic development can be expected to deteriorate.

Falling prices can pose major problems for highly indebted households, partly because there is a risk of lock-in effects if the value of the home becomes low relative to the debt. Households may then find it difficult to adjust their lifestyle and hence reduce their housing expenses if their economic conditions change. Such lock-in effects can be a problem for the economy at large if they affect many households, as the functioning of both the housing market and the labour market will be impaired.

In the event of a major price fall, a situation may also arise in which housing construction has increased too much in relation to market demand. This may occur, for example, if construction is based on overly optimistic income and price expectations, or if there is an unexpectedly sharp fall in household demand. Some companies may then have problems selling their homes if they do not adapt the price to the weaker market conditions. Neither is it likely in such a situation that all the projects currently in the planning phase will reach the market. This may in turn lead to some property developers encountering profitability problems and struggling to renew their funding. Ultimately, they may find it difficult to stay in business.¹⁷

The major banks have a large percentage of loans with homes and other types of property as collateral on their balance sheets. To finance these mortgages, the major banks issue covered bonds with mortgages as collateral. As mortgages have increased in recent years, so have the volumes of covered bonds, a large share of which are in foreign currency. Housing prices are hence closely linked to the banks' funding. A fall in housing prices may affect confidence in Swedish banks and they may be forced to renew their funding at a higher price, or encounter problems in renewing their funding altogether. This could lead to very serious problems for the financial system. However, the decline in housing prices observed since the autumn of 2017 has yet to affect banks' borrowing costs.

If consumption and housing investment decline, this may in turn reduce the profitability of other Swedish companies and lead to higher unemployment, which may ultimately lead to increased loan losses for banks. Confidence in the banks could weaken in such a situation, which could also have a negative effect on both access to and the cost of banks' funding.¹⁸

There is therefore a risk of economic development entering a downward spiral with serious consequences for both financial and macroeconomic stability.¹⁹

¹⁶ Household indebtedness and interest rate sensitivity. Article in *Financial Stability Report* 2017:2. Sveriges Riksbank.

¹⁷ See Chapter 2 in *Financial Stability Report* 2017:2. Sveriges Riksbank.

¹⁸ Of banks' total wholesale funding, about 60 per cent is in foreign currency.

¹⁹ Emanuelsson, R., Melander, O. and Molin, J. (2015), Financial risks in the household sector, *Economic Commentary* no. 6. Sveriges Riksbank.

²⁰ Katinic, G. (2018), Perspectives on housing construction, *Economic Commentaries* No. 2. Sveriges Riksbank.

risks associated with household debt and the housing market may spread to the rest of the economy”).

Vulnerabilities and risks in the Swedish banking system

As before, the Riksbank sees vulnerabilities and risks in the Swedish banking system. This is due in particular to its structure and large exposures to the housing market, and to its limited capital levels and low resilience to liquidity risks. Most of these risks are expected to remain even if Nordea moves to Finland (see the article “Consequences for financial stability of Nordea’s relocation to Finland”).

Structural vulnerabilities in the Swedish banking system

The Swedish banking system is large both in relation to the Swedish economy and in a European perspective. The Swedish banking system's total assets currently amount to around 400 per cent of Sweden’s GDP.²¹ If Nordea moves, the assets will amount to around 300 per cent of GDP. The banking system will thus still be of a considerable size and on a level with the average for EU member states.

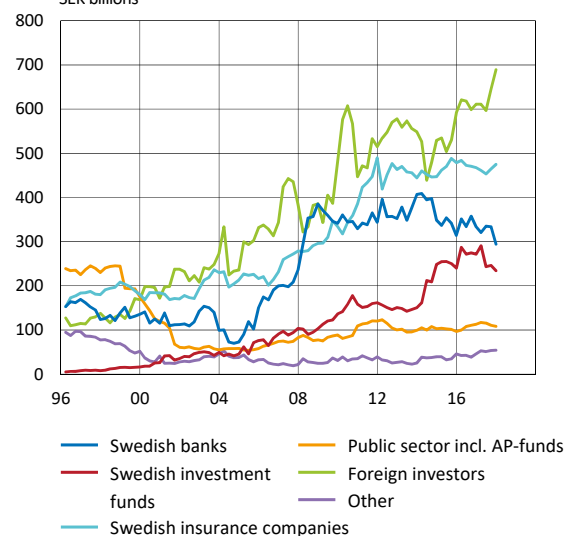
Furthermore, the Swedish banking sector is strongly concentrated and the four major banks, Handelsbanken, Nordea, SEB and Swedbank, are together responsible for around 80 per cent of the Swedish banking market. If Nordea moves, it will continue to have an active bank branch in Sweden, in the same way as Danske Bank has today. Together, Nordea and Danske Bank will make up around 20 per cent of the Swedish banking sector. Nordea’s current Swedish subsidiaries will probably not be affected by the move. Overall, the high concentration in the Swedish banking system is expected to remain.

The major banks are also closely interconnected and have significant exposures towards each other, especially in the form of securities. For example, Swedish banks are among the largest owners of each others’ covered bonds (see Chart 2:9). The structure of the Swedish banking system means that problems in one bank can quickly spread to other banks and markets, and damage confidence in the entire financial system (see the article “Interconnectedness in the Swedish financial system”).

The major banks face greater competition

The four major banks continued to report higher profitability than the European average in 2017 (see Chart 1:7). The fact that mortgages are a profitable product makes it particularly

Chart 2:9. Owners of Swedish covered bonds
SEK billions



Sources: Statistics Sweden and the Riksbank

New rules on payment services

The legislation implementing the revised Payment Services Directive (PSD2) comes into force on 1 May 2018.²² The legal amendments²³ involve, among other things, third-party payment service suppliers, i.e. suppliers of account information and payment initiation services, being given access to payment accounts at banks and other credit institutions following consent from the consumer. In practice, this means that it will be possible for consumers to use other agents, alongside credit institutions, to perform financial services such as payments. The aims of the amendments include the development of a market for electronic payments and better conditions for safe and efficient payments and hence stronger consumer protection. Clear rules should also create better conditions for innovation and product development among agents offering payment services.

²¹ The term ‘the Swedish banking system’ refers to MFIs according to Statistics Sweden’s definition and their total bank assets in Sweden, including bank branches and subsidiaries active in Sweden under foreign management, as well as Swedish banks’ branches abroad.

²² The first Payment Services Directive (PSD) was adopted in 2007 and incorporated into Swedish law mainly via the Payment Services Act (2010:751).

²³ PSD2, adopted in 2015, has been incorporated into Swedish law mostly via amendments to the Payment Services Act.

attractive for new operators to challenge the major banks with alternative models for lending. Greater competition can generally be positive for financial stability, but untested business models may pose risks (see the article “New players on the mortgage market”). At the same time, the market for payment services is developing and the regulation is becoming clearer (see the fact box “New rules on payment services”). It is important to continue to follow developments in both the mortgage market and the payment services market.

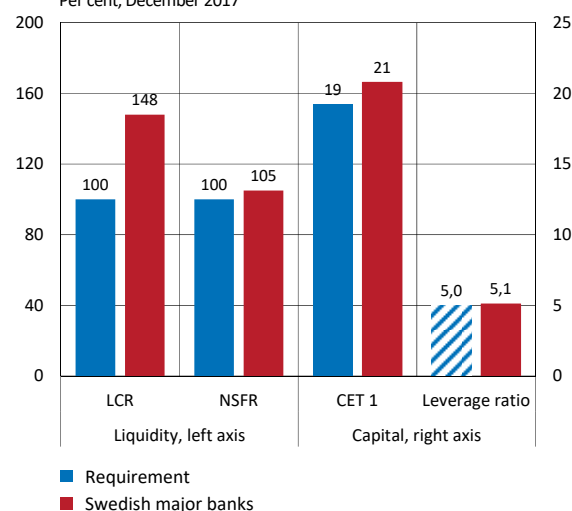
The major banks are exposed to liquidity risks

The Swedish banks 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. To meet this requirement, the LCR must be 100 per cent (see Chart 2:10). At the start of the year, FI’s previous LCR regulatory framework was replaced by the European Commission’s delegated regulation.²⁴ The definitions differ to some extent. The new definition means that some banks’ LCR will automatically be higher without any improvement in their resilience. One reason for this is because covered bonds are treated more favourably in the new regulatory framework,²⁵ which increases the LCR. However, if banks choose to increase their share of covered bonds in the liquidity reserve, their cross-ownership of each other’s securities rises, increasing vulnerability in the system.

Over the past six months, the major Swedish banks have continued to report high LCRs in the currencies for where there are requirements from FI (see Chart 2:11).²⁶ Periodically, however, some of the major banks have very low LCRs. This applies, in particular, to Swedish kronor but also to other significant currencies, for which there are no corresponding requirements.²⁷ The lowest LCR observed, in July 2017, meant, in slightly simplified terms, that the individual major bank did not even have buffers in Swedish kronor corresponding to the expected requirement for three days of stress (see Chart 2:12). In addition to euros and US dollars, other significant currencies not subject to requirements comprise more than half of the banks’ liquidity outflows in a stress

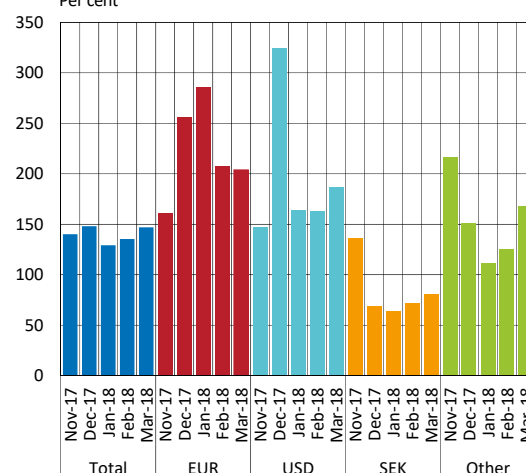
Chart 2:10. The four Basel measurements
Per cent, December 2017



Note. The minimum level of the leverage ratio has not yet been determined, so the chart shows the level recommended by the Riksbank. Since the beginning of 2018, the banks’ leverage ratios have decreased slightly and averaged 4-5 per cent at the end of March. CET1 is an abbreviation for Common Equity Tier 1 ratio. Minimum level for CET1 and actual CET1 are calculated as weighted averages.

Sources: Bank reports, BIS and the Riksbank

Chart 2:11. The major banks’ LCRs in different currencies
Per cent



Note. Refers to a weighted average. The calculations for 2018 follow the EU regulatory framework.

Source: Finansinspektionen

²⁴ See European Commission Delegated Regulation (EU) 2015/61 of 10 October 2014 to supplement Regulation (EU) No 575/2013 of the European Parliament and the Council with regard to liquidity coverage requirement for credit institutions.

²⁵ Covered bonds are given a lower risk weight and are allowed to comprise a larger share of the liquidity reserve. Covered bonds may comprise a maximum of 70 per cent of the liquidity reserve compared with 40 per cent in accordance with the previous regulatory framework. Covered bonds are also given a 7-per cent risk weight compared with 15 per cent previously.

²⁶ FI has chosen to continue to impose requirements of 100 per cent LCR in euros and US dollars within the framework of Pillar 2. See *FI’s Pillar 2 requirements for liquidity coverage ratios in individual currencies*, December 2017. Finansinspektionen.

²⁷ 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 2015/61 on LCR.

scenario,²⁸ and around two-thirds of their borrowing and short-term funding (see Chart 2:13).

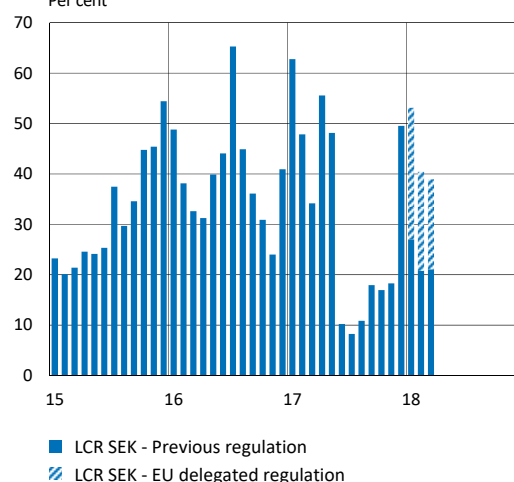
Measured in terms of LCR, the banks thus take significant short-term liquidity risks in these currencies. To cover their short-term liquidity needs in these currencies, the banks rely on the foreign exchange swap market, and ultimately with the Riksbank and other central banks as guarantors.²⁹ Situations may, however, arise when the foreign exchange swap market functions less efficiently than normal, or when the market is not accessible for a certain bank. There are also short-term liquidity risks among the major Swedish banks that are not fully captured in the LCRs. The fact that a bank attains the minimum requirement for the LCR does not, for example, say very much about how it would cope with stress that lasted more than a month. Low resilience to liquidity stress can threaten financial stability in the long run. It is therefore of the utmost importance that banks can primarily manage their short-term liquidity risks themselves.

One way of calculating the banks' 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 105 per cent on average for the major Swedish banks (see Chart 2:10), which exceeds the level recommended by the Basel Committee from January 2018.³⁰ However, the Riksbank does not consider that the NSFR, in its current form, captures the large mismatch in maturities that exists between many banks' assets and liabilities. Thus, the NSFR does not capture the difference in maturity for funding of more than one year. This means, for instance, that funding with 13-month maturity is regarded in the regulatory framework as equally stable as funding with maturities of longer than 10 years. This problem was illustrated in a study published by the Riksbank in autumn 2016.³¹ This study highlighted other measures of structural liquidity risk. If liquidity is measured in terms of these alternative measurements, the banks' liquidity situation has not noticeably changed (see Chart 2:14). However, a few of the new players in the mortgage market fund their mortgages on the market with long maturities, which means that they generally take lower structural liquidity risks in the mortgage market.

The banks' capital ratios have not changed

Given the structural vulnerabilities and liquidity risks in the Swedish banking system, it is important for banks to hold a sufficient amount of capital.

Chart 2:12. Lowest monthly LCR observations in SEK
Per cent

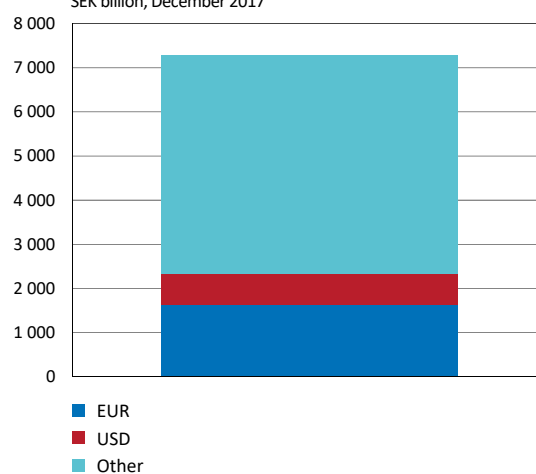


Note. Lowest LCR level in Swedish kronor for any of the four major banks on a monthly basis according to FI's previously applicable regulations on LCR requirements and reporting of liquid assets and cashflows (FFFS 2012:6), and the European Commission's delegated regulation EU 2015/61 supplementing Regulation (EU) No 575/2013 of the European Parliament and the Council with regard to liquidity coverage requirement for credit institutions. The patterned area shows the lowest level based on the EU delegated regulation.

Sources: Finansinspektionen and the Riksbank

Chart 2:13. The banks short term liabilities and demand deposits

SEK billion, December 2017



Note. Banks' short-term liabilities with maturities of less than one month per currency.

Sources: Banks' annual reports and the Riksbank

²⁸ For an example of a stylised stress scenario, see Short-term liquidity risks in the major Swedish banks. *Financial Stability Report 2017:2*. Sveriges Riksbank.

²⁹ Short-term liquidity risks in significant currencies. Article in *Financial Stability Report 2016:2*. Sveriges Riksbank.

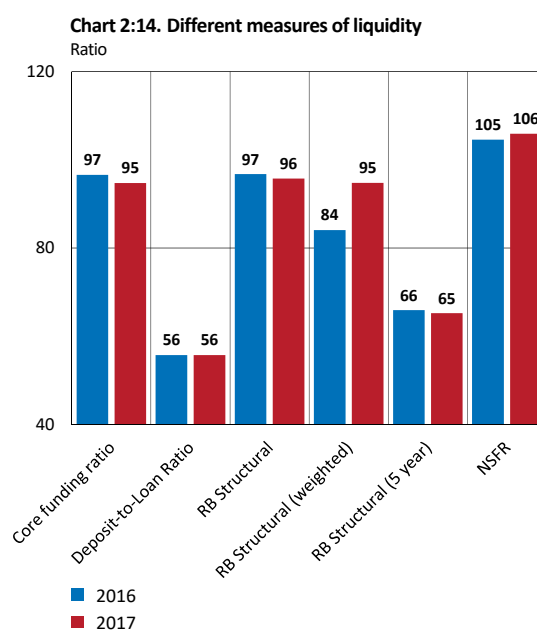
³⁰ According to the Basel Committee for Banking Supervision, banks shall fulfil 100 per cent in NSFR as from 1 January 2018.

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

The major banks' capital in relation to risk-weighted assets (Common Equity Tier 1 capital ratios, CET1) has remained relatively unchanged recently and averaged 20.8 per cent in December 2017 (see Chart 2:10). This is a higher level than FI's requirement. One of the reasons is probably that banks give themselves an extra margin with regard to the forthcoming regulations and how these could conceivably affect their capital requirements.³² FI recently proposed that the current Pillar 2 requirement, which corresponds to a risk weight floor for Swedish mortgages of 25 per cent be replaced by a corresponding capital requirement in Pillar 1 as from 31 December 2018.³³ The Riksbank supports this proposal, which, if realised, would increase the Pillar 1 requirement for certain banks and make it easier to compare banks' capital requirements and capital levels.

It is positive that banks allow for a margin as regards their capital requirements but there are flaws in the risk-weighted capital measures, which can sometimes lead the banks to underestimate their risks and hold too little capital, something which the Riksbank has previously highlighted. The Riksbank has therefore pointed out the importance of also introducing a leverage ratio requirement that measures the share of capital in relation to banks' total exposure, i.e. a capital requirement that does not take the various risk weights of the assets into consideration. The measured leverage ratio in the Swedish banking sector was largely unchanged the first quarter of 2018 compared with the same period previous year. Compared with other European countries, Swedish banks have low leverage ratios (see Chart 2:15).

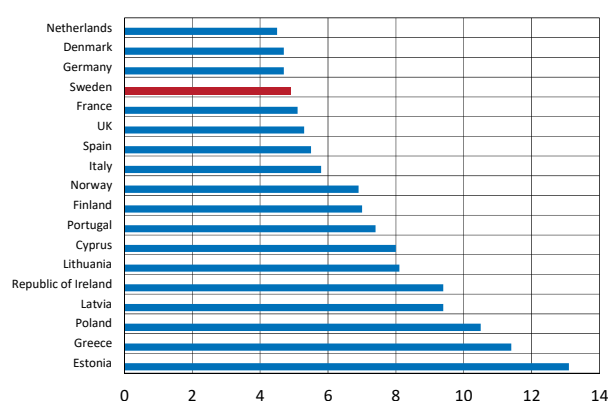
In December 2017, negotiations were concluded on the Basel III framework, the international reform package negotiated by the Basel Committee on Banking Supervision in the wake of the financial crisis. The framework sets stricter requirements for capital and liquidity levels among internationally active banks and is intended to be fully implemented on 1 January 2027. The Basel Committee has agreed, among other things, to introduce an international minimum requirement for the banks' leverage ratios of 3 per cent, with higher requirements for global systemically important banks. The leverage ratio requirement is included in the EU's Banking Package, a proposed legal amendment that concerns several parts of the financial sector. This legal amendment is currently being negotiated in the EU and will cover all member states. It



Note. A higher level of the measure shown in the chart indicates lower structural liquidity risks. For more information of the measure, see Swedish banks' structural liquidity risks, Riksbank Studies, November 2016. Sveriges Riksbank.

Sources: Banks' interim reports, Liquidatum and the Riksbank

Chart 2:15. The leverage ratio in various countries
Per cent, December 2017



Note. Refers to weighted average per country.

Source: European Banking Authority (EBA)

³² The banks give themselves an extra margin with regard to the implementation of a floor for risk-weighted assets, the aim of which is to reduce variability in the banks' risk-weighted 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 reform 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.

is therefore unclear when the legislation will be implemented in Sweden.

Basel III is expected to lead to an increase in the minimum requirements for CET1 capital among Swedish banks once the standards have been fully implemented in Sweden. However, the size of the banks' total CET1 capital requirements going forward will also depend on how FI chooses to implement the special Swedish requirements.³⁴

From January 2018, Swedish banks need to adjust their credit and financial instruments to the new accounting standard IFRS 9 (see the fact box "New accounting standard for financial instruments"). In the future, the new standard can help strengthen financial stability, as it will improve the banks' management of credit risks and lead to greater transparency, although it may also lead to higher volatility in banks' income statements.

Vulnerabilities and risks associated with low and rising interest rates

Interest rates in Sweden and abroad have been low for a long time. Structural factors such as increased global savings have contributed to global real interest rates being pushed down.³⁵ As a consequence of this and of weak economic developments, policy rates in many countries have fallen to historically low levels.

Since the turn of the year, government bond yields with long maturities have risen in the United States. The increase in long-term yields in the United States is due to expectations about higher policy rates in the future. If inflation in the United States was to increase more quickly than market agents expect, it may lead to risk being repriced on the US market and thereby pushing up long-term government bond yields even further. This could spread to other countries, especially those that have borrowed, or will have the need to borrow, large volumes in US dollars. In a situation where countries are in need of an expansionary monetary policy, this global rate increase can instead cause a tightening.

Risks associated with long periods of low interest rates

Low interest rates over a long period of time can lead to exaggerated risk-taking, to assets being overvalued and to various parties increasing their debt to an unsustainable level.³⁶ In such a situation, the probability of large price falls and greater volatility on asset markets increases, which in

New accounting standard for financial instruments

IFRS 9 is a new accounting standard for financial instruments applicable from 1 January 2018. It replaces the previous IAS 39 standard. IFRS 9 contains new principles for the classification and valuation of financial assets, a new method for hedge accounting, and a new model for making provision for credit losses based on expected credit loss (ECL). The most significant change compared with the previous standard is the approach to provision for credit loss. According to IFRS 9, the reporting of expected credit loss shall be based, among other things, on forecasts for future macroeconomic conditions.

The new model is intended to address the criticism of the previous standard, IAS 39, in which credit losses were only reported if there were clear signs of a credit event having occurred, i.e. default or delinquency in interest or principal payments. With IAS 39, therefore, only credit events that had already occurred were reported. According to the new model, provision shall be made directly in connection with the lending instead of waiting for an actual loss. This means that credit loss provisions will increase and occur at an earlier stage than was the case with IAS 39. According to a study performed by the European Banking Authority (EBA), the transition to IFRS 9 will lead to provisions increasing by 13 per cent on average for a sample of European banks.

When provisions increase in connection with the transition to IFRS 9, companies' equity will decrease. Initially, this will hence affect the banks' capital adequacy negatively as the reduction of equity affects the banks' CET1. According to the EBA, the transition to IFRS 9 will entail a reduction of the CET1 capital ratio by 45 points, on average, for European banks. The transitional effects of IFRS 9 on the major Swedish banks will be limited, however. The four major Swedish banks are expecting increased provisions, but the effect on reported capital ratios will be modest. One reason for this is that they have a low proportion of non-performing loans (NPLs). But for banks with a large proportion of non-performing loans, as is the case in several European countries, the effects on capital ratios may be larger (see Chart 2:20). In the long term, IFRS 9 may improve banks' credit risk management and also lead to greater transparency and more effective market discipline, which can strengthen financial stability.

³⁴ For more information on how Basel III affects Swedish banks, see Edlund, T. (2017), Basel III and the major Swedish banks' capital requirements, *Economic Commentaries* No. 7. Sveriges Riksbank.

³⁵ The long-term repo rate. Article in Monetary Policy Report, February 2017. Sveriges Riksbank.

³⁶ For a study of various aspects of the low interest rates, see *Macprudential policy issues arising from low interest rates and structural changes in the EU financial system*, November 2016. European System Risk Board (ESRB) and also Gibas, N., Juks, R. and Söderberg, J. (2015), Swedish financial institutions and low interest rates, *Economic Commentary* no. 16. Sveriges Riksbank.

turn poses a risk to financial and macroeconomic stability (see the fact box “The risks associated with household debt and the housing market can spread to the rest of the economy”). The indicator developed by the Riksbank to measure vulnerability in the financial system also shows that the current vulnerabilities are substantial in a historical perspective (see Chart 2:16).³⁷ The upturn is partly due to the increase in lending to households. Total debt in Sweden has been rising over a long period of time, indicating that more factors than just low interest rates have contributed to the increased indebtedness (see Chart 2:17).

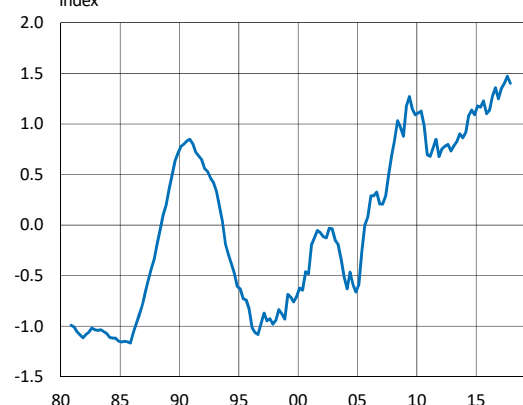
As described above, housing prices have been rising rapidly for a long time. Prices for commercial properties in Sweden have also increased rapidly, among other things due to the positive development of the economy and the low costs of borrowing. Equity prices have increased strongly and equity valuations are currently higher than prior to the financial crisis in 2008 and prior to the IT bubble bursting at the beginning of the 2000s (see Chart 2:18). These high price levels mean that the likelihood of a price fall is increased.

Low interest rates make banks and insurance companies more vulnerable

In Sweden, banks have continued to show good returns despite the low level of interest rates (see Chart 1:7 in Chapter 1), due to high cost efficiency and low credit losses among other reasons. But Swedish banks’ continued good profits can also, to a certain extent, be explained by increased lending, above all with housing and property as collateral. This increased lending does not necessarily mean that the percentage of high-risk borrowers has increased. There is rather a risk that the banks have increased their total exposure to the property market, which in turn is associated with risks.

A long period of low interest rates can also make it more difficult for life insurance companies to fulfil their commitments to policyholders.³⁸ When interest rates are low, for instance, the return on the new bonds in which the companies reinvest when their bonds mature will be lower. The fact that the companies’ bond holdings mature a long time before insurance policies are to be redeemed therefore poses a risk to the companies.³⁹ If the period of low interest rates continues even longer, insurance companies will have the incentive to seek higher returns from alternative financial products. One such product is funds that invest directly in

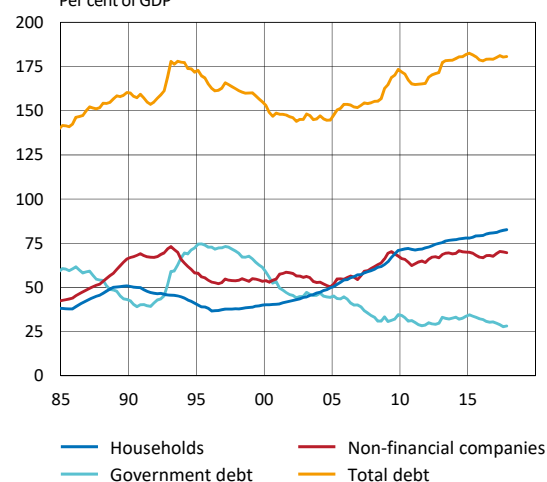
Chart 2:16. Indicator of financial vulnerability
Index



Note. The indicator is based on underlying indicators such as the deviation from trend in the banks’ lending to households and companies to GDP, real housing prices, and non-stable in relation to stable funding of bank lending. Higher index figures indicate greater vulnerability.

Sources: Statistics Sweden and the Riksbank

Chart 2:17. Indebtedness in Sweden
Per cent of GDP



Note. Total debt represents a summary of other debt categories. Corporate debt include market borrowing and borrowing from monetary financial institutions (MFI).

Sources: Statistics Sweden and the Swedish National Debt Office

³⁷ The vulnerability indicator basically weighs together three underlying indicators selected to reflect the vulnerability of different parts of the financial system. The underlying indicators are calculated as the deviation from trend in bank lending to households and companies in relation to GDP, as real housing prices and as non-stable funding of bank lending in relation to stable funding. See Giordani, P. Spector, E. and Zang, X. (2017), A new early warning indicator for financial fragility in Sweden, *Economic Commentary* no. 1. Sveriges Riksbank.

³⁸ *EIOPA Insurance Stress Test Report*, December 2016. EIOPA.

³⁹ Gibas, N., Juks, R. and Söderberg, J. (2015), Swedish financial institutions and low interest rates, *Economic Commentary* no. 16. Sveriges Riksbank.

mortgages and that can generate higher interest than covered bonds (see the article “New players on the mortgage market”). At the same time, these loans mean that insurance companies can better match the maturities between assets and liabilities, thereby reducing their maturity mismatches.

At present, Swedish life insurance companies have a relatively good financial position. This is partly because their relatively large equity assets have risen in value (see Chart 2:19). At the same time, the large holdings make them vulnerable to a fall in prices on the equity market. In the event of a large fall in prices, they may need to sell the equity in favour of safer assets. And if several insurance companies do this at the same time, it could reinforce market fluctuations and thereby entail risks to financial stability. The global fall in equity prices at the beginning of 2018 (see Chapter 1) was, however, well within the framework for what Swedish life insurance companies can cope with without having problems with the solvency requirements. In stress tests performed in 2016 by the European Insurance and Occupational Pensions Authority (EIOPA), life insurance companies have coped with the scenario of major fluctuations in asset prices without encountering solvency problems.

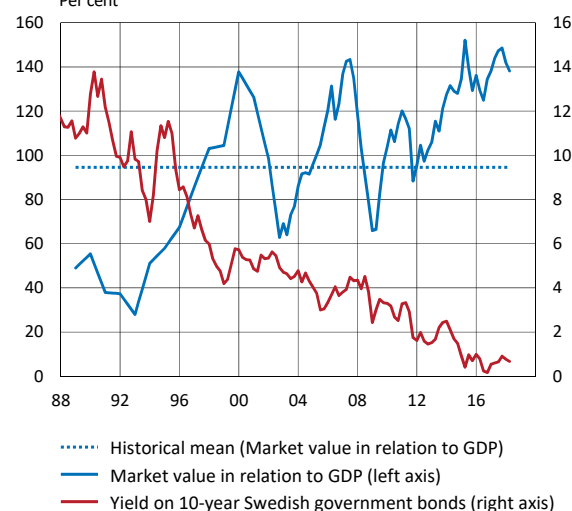
Vulnerabilities and risks linked to the financial infrastructure

The financial infrastructure has a central role in the financial system in that it makes it possible to conduct payments and other financial transactions. A safe and efficient financial infrastructure is a prerequisite for the smooth functioning of the financial markets and hence the economy in general. The risks that may arise in the financial market infrastructures (FMIs) are largely operational. It is a question of risks associated with processes and systems that have to work in order for a company to be able to uphold its functions and perform its transactions. The fact that risks in the infrastructure can cause problems for the entire financial system is partly due to there often being only one agent handling certain critical transactions and the financial system being strongly interconnected (see the article “Interconnectedness in the Swedish financial system”).

Most FMIs hence differ from banks, in which the greatest risks are financial risks such as credit risk and liquidity risks. Central counterparties are, like banks, exposed to both operational and financial risks. The operational risks can also lead to financial risks among other agents in the financial system if they are not dealt with.

The Riksbank's assessment of resilience and the risks in the infrastructure is based in part on the CPMI-IOSCO principles for financial market infrastructures.⁴⁰ These set

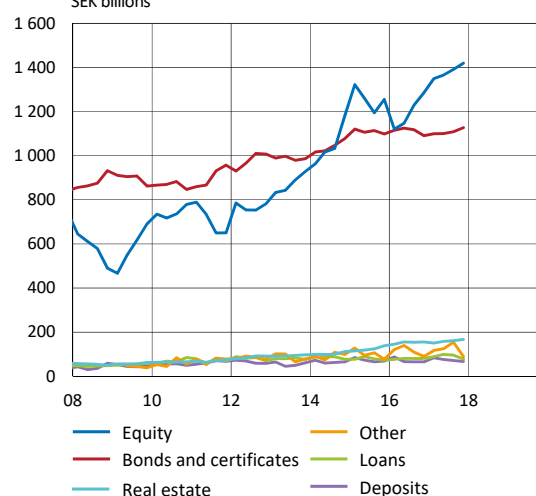
Chart 2:18. Equity market value in relation to GDP in Sweden
Per cent



Note. Market capitalisation refers to the total stock market value for the assets included the index for all quoted shares on the Stockholm Stock Exchange (OMX Index). Annual data for market capitalisation up until 2002 and quarterly data thereafter. The data refers to the end of each period.

Sources: Bloomberg, Statistics Sweden, the World Bank and the Riksbank

Chart 2:19. Life insurance companies' assets
SEK billions



Note. Equities excludes wholly-owned property companies and unit-linked insurance assets.

Source: Statistics Sweden

⁴⁰ CPMI-IOSCO (2012), *Principles for financial market infrastructures*. BIS.

strict requirements in a number of areas, which FMIs must fulfil in order to ensure good resilience and efficiency. FI has responsibility for the supervision of infrastructure systems that are not owned by the Riksbank. FI's supervision and the Riksbank's oversight complement each other and the authorities cooperate closely in these matters.⁴¹

Elevated risks in the financial infrastructure

Over the last year, the infrastructure companies have adopted measures to increase their resilience, but there are still shortcomings and further work is needed. The Riksbank deems that the operational risk in the financial infrastructure is elevated due to the risk of cyberattack and the risks connected to Euroclear Sweden's old system for securities settlement.⁴² Another risk is linked to the central counterparties' buffers for use under financial stress. If, for some reason, these buffers should be reduced, there is a requirement that they shall be refilled within a certain period of time. At present, this is assessed not to be done quickly enough. The Riksbank has previously pointed out the importance of infrastructure companies taking responsibility for outsourced operations, for example when servers are located outside Sweden. The Riksbank emphasises that responsibility and control lie with the infrastructure company.

The Riksbank's assessment is also that there are particular risks and vulnerabilities as individual central participants are closely interlinked. It is therefore important to carefully monitor developments in this area and the implications it may have for financial stability (see the article "Interconnectedness in the Swedish financial system"). The hub of this interconnected system is RIX, the Riksbank's own payment system. There exist identified operational risks due to RIX's dependence on other functions in the Riksbank.⁴³ It is therefore important that RIX completes the initiated work of reducing the risks arising from its dependence upon internal functions within the Riksbank. Furthermore, the CPMI has published a strategy for reducing the risks of fraud in payment systems such as RIX.⁴⁴ It is important that the Riksbank follows and implements this strategy.

Cyberattack can spread rapidly through the financial system

One of the operational risks is the risk of being subjected to a cyberattack. An attack is initially only a problem for the agent under attack. But as the financial system is strongly interconnected, a cyberattack on one agent can quickly spread to

⁴¹ Billborn, J. (2018), The Riksbank's oversight of the financial infrastructure, Economic Commentaries No. 7. Sveriges Riksbank.

⁴² For a description of their operations, see *Financial Infrastructure Report 2017*. Sveriges Riksbank.

⁴³ RIX is dependent on other parts of the Riksbank's operations, such as functions for the management of its IT environment, regulatory framework, analysis and risk management. This dependence can give rise to risks that may reduce efficiency and stability in the RIX system, see more in *Financial Infrastructure Report 2016* and *Financial Infrastructure Report 2017*. Sveriges Riksbank.

⁴⁴ CPMI (2018), *Reducing the risk of wholesale payments fraud related to endpoint security*, May 2018. BIS.

other agents in the financial system. The interconnectedness, and the fact that attackers are constantly changing their approach, means that a cyberattack, in a worst-case scenario, can lead to a long stoppage in the financial infrastructure, something which would affect many agents in the economy. When the financial system is strongly interconnected, it can also be very difficult to analyse what has happened and what the consequences are. If FMIs are unable to uphold their functions in such a situation or if confidence in the security of their systems is damaged, it may have consequences for liquidity supply in the economy. CPMI-IOSCO has issued an addendum⁴⁵ to the principles for the financial infrastructure that provide guidance on how FMIs are to manage cyber risks.

The Riksbank has conducted surveys⁴⁶ among Swedish FMIs to analyse their resilience to cyber threats. The findings show that they have in general taken many measures and that they are working actively to strengthen their protection and their ability to handle an attack. How far they have come in their work varies.⁴⁷ For example, variation exists in the maturity of routines and control processes regarding cyber risks. The Riksbank urges infrastructure companies and their participants to continue to work actively on strengthening their routines surrounding cyber-risks and to keep themselves continually updated in this area. The Riksbank will actively continue to follow developments within the framework of its oversight.

The operational risk related to Euroclear Sweden's system for securities settlement is still elevated

Disruptions to the function for securities settlement lasting longer than a day or so could have far-reaching consequences for many agents in the Swedish economy. If a stoppage in Euroclear Sweden's VPC securities settlement system were to occur at a time of day or on a day of the month when large volumes of transactions are to be settled, this could rapidly lead to significant liquidity shocks for both banks and other FMIs.

On several occasions since 2013, the Riksbank has highlighted the risks associated with the age, inflexibility and complexity of the VPC system.⁴⁸ This implies that making changes in the system is risky. These risks must now be dealt with as a result of new requirements for central securities depositories laid down in the European CSDR regulation.⁴⁹ Over the past year, Euroclear Sweden has therefore continued with the work to adapt the VPC system to the new

⁴⁵ CPMI-IOSCO (2016), *Guidance on cyber resilience for financial market infrastructures*, June 2016. BIS.

⁴⁶ The survey has been produced by the ECB and is based on established international standards for cybersecurity such as ISO 27001. CPMI-IOSCO (2016), *Guidance on cyber resilience for financial market infrastructures*, June 2016. BIS.

⁴⁷ This is revealed by the survey that the Riksbank conducted with the Swedish infrastructure companies in summer 2017.

⁴⁸ *Financial Infrastructure Report 2017*. Sveriges Riksbank.

⁴⁹ The CSDR (regulation EU 909/2014) contains uniform rules on competition for central securities depositories within the EU. A central securities depository authorised under the CSDR may operate throughout the entire EU.

requirements. For some time, they have also been working to reduce the risks associated with the system's age and structure. Euroclear Sweden has taken steps to manage the remaining risks and to modernise the system so that it can fulfil future requirements for security and flexibility.

The VPC system is robust and reliable as long as no changes need to be made in the system. But because of its complex structure, it is difficult to gain an overview of the possible consequences when making changes in the system. There is therefore a risk of changes having unintentional consequences that may lead to shocks.

It is very important for Euroclear to take immediate measures to deal with remaining risks in the system. The Riksbank is following developments closely. The Riksbank's overall assessment is that the operational risk is still elevated until the CSDR adaptation has been implemented and until Euroclear Sweden has taken sufficient measures to limit the risks associated with changes in the system.

Risk of central counterparties not replenishing pre-financed funds quickly enough

In recent years, central counterparties have been given a greater and more significant role in the financial system and they are now considered to be systemically important. Central counterparties 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. This means that they are exposed to financial risks such as credit and liquidity risks. To manage these risks, a central counterparty must have enough pre-financed resources. This implies that they need to have enough collateral pledged by participants to the central counterparty, receive sufficient contributions from participants to the default fund and have enough equity of their own to be able to manage participants' insolvency.

In addition, the central counterparty must be able to replenish its pre-financed resources quickly, if they need to be used. Nasdaq Clearing currently has sufficient pre-financed resources in its default fund. But the agreements Nasdaq Clearing has with its participants do not make sure that the default fund is replenished quickly enough. If not replenished quickly enough there is a risk that the pre-financed resources in the default fund will not be sufficient in relation to what is required by international standards. Nasdaq Clearing therefore needs to ensure that the agreement it has with its participants obliges them to replenish the default fund more quickly than is currently the case. This is particularly important for operators on the Swedish and Nordic markets, where there are few participants and a shock risks spreading rapidly in the financial system in a situation where the stress level in the system is probably already high.

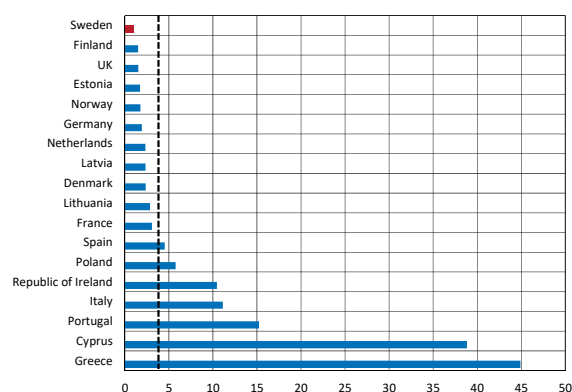
Risks linked to international developments

The fact that Sweden is a small, open economy with considerable foreign trade and a financial system that is strongly dependent on international financial markets means that economic and political uncertainty abroad also poses risks to Swedish financial stability. Global economic activity continues to strengthen but, as before, there are some risks that, if they materialise, can lead to weaker economic development.

There are risks associated with economic and political uncertainty. For example, uncertainty remains with regard to the economic effects of the United Kingdom leaving the EU. As before, there are also several structural problems in the euro area, for instance, regarding the banking sector in Italy (see Chart 2:20) and weak public finances in several countries. Furthermore, there is still unease about protectionism and the spread of possible counter-measures with regard to trade tariffs announced by the United States and China.⁵⁰ Another source of uncertainty linked to the US economy is that the expansionary fiscal policy in the long term risks threatening the sustainability of public finances, which in a bad scenario can lead to sharply rising interest rates, large fluctuations in the USD exchange rate and substantially lower growth.

Economic activity in Sweden's neighbouring countries is continuing to strengthen. In the Nordics and Baltics, the largest domestic and regional financial stability risk is linked to the development of housing prices and household indebtedness. In Denmark, for example, prices of tenant-owned homes continuing to rise rapidly while in Norway they have picked up again after having fallen for most of 2017 (see Chart 2:21). As in Sweden, households in Denmark and Norway in particular are highly indebted. This means that households are vulnerable to changes in economic conditions, such as a large fall in housing prices or rising interest rates. If housing prices were to fall on a broad scale, it could affect development of the real economy and financial stability of the country concerned, but the effects could also spread to other countries in the region through the integrated financial system.

Chart 2:20. Non-performing loans at European banks
Per cent, share of total lending

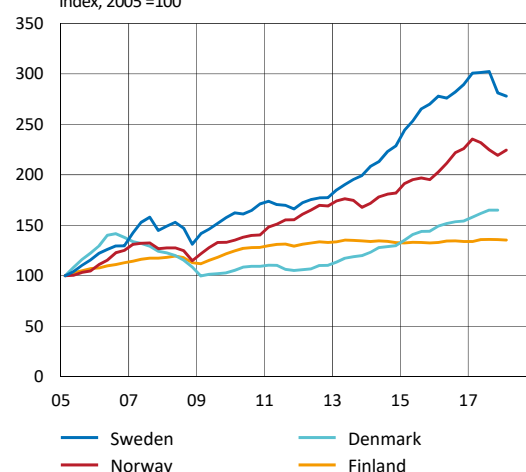


Note. Non-performing loans are defined by the European Banking Authority (EBA) as loans in which the borrower has paid neither interest nor amortisations in the last 90 days. The broken line shows the average level for the proportion of non-performing loans in the EU. Data refers to the fourth quarter of 2017.

Source: European Banking Authority (EBA)

Chart 2:21. Apartment prices in Sweden, Norway, Denmark and Finland

Index, 2005 = 100



Sources: Statistics Denmark, Statistics Finland, Statistics Norway and Valueguard

⁵⁰ Monetary Policy Report, April 2018. Sveriges Riksbank.

CHAPTER 3 – Recommendations

Swedish households' high indebtedness is threatening financial and macroeconomic stability. It is therefore important to attempt to reduce the risks of household indebtedness and to reduce the vulnerability of the household sector. At the same time, there are structural vulnerabilities in the Swedish banking system that make it sensitive to shocks. Therefore, both the banks' capital levels and their ability to manage liquidity risks need to be strengthened so that their resilience is improved. It is also important that new players on the mortgage market are covered by relevant macroprudential regulation.

Household resilience needs to increase

Household indebtedness has been increasing for a long time. In addition, most households have variable-rate loans and only amortise to a limited extent. Taken together, this has contributed to the accumulation of risks and the weakening of households' financial resilience over time. It is therefore important to continue with measures to reduce risks and increase resilience in the household sector.

This high level of indebtedness is, among other things, due to the housing market functioning poorly and to the tax system not being well designed from the perspective of financial stability. Consequently, measures within these policy areas in particular are of primary importance.

Interest rates have been low for a long time, which has contributed towards increasing household indebtedness. In addition, structural factors such as increased global saving have contributed to global real interest rates being pushed down.⁵¹ A significantly higher repo rate could slow down the build-up of debts but would also lead to higher unemployment and lower inflation. Measures that are more specifically focused on reducing the risks linked to household debt have fewer negative effects on the economy as a whole. This includes, for example structural measures aimed at creating a better functioning housing and mortgage market or macroprudential measures.

It is also important to consider at which point it would be most appropriate to introduce various measures. First and foremost, structural measures are needed to increase the resilience of the financial system without bringing about overly negative effects in the short term. However, it is important to emphasise the long-term gains from various measures and thereby the importance of creating a robust financial system, regardless of the economic situation.

In March 2018, Finansinspektionen (FI) introduced a stricter amortisation requirement targeting households with high debt in relation to their income. Earlier this year, FI also gained legislative support to counteract financial imbalances on the credit market, making the process for the

Table 3.1. The Riksbank's current 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.
Finansinspektionen should set the countercyclical capital buffer value at 2.5 per cent.
Banks' liquidity risks
Finansinspektionen should set Liquidity Coverage Ratio (LCR) requirements in Swedish kronor and other significant currencies for the major Swedish banks.
The major Swedish banks 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.
The major Swedish banks should report their Liquidity Coverage Ratios (LCR), in Swedish kronor and other significant currencies, as well as their Net Stable Funding Ratios (NSFR), at least once a quarter.

⁵¹ The long-term repo rate. Article in *Monetary Policy Report*, February 2017. Sveriges Riksbank.

implementation of macroprudential measures clearer and shorter. However, the regulations regarding the application of tools will also continue to be dependent on the Government's consent. A better approach would have been for the Government only to decide which macroprudential policy instruments should be delegated to FI and within which framework FI should apply them. This would have increased FI's independence and made it possible for FI to act more quickly.⁵² This system would also have been more in line with the European Systemic Risk Board's (ESRB) recommendation for macroprudential policy.

Increased Nordic collaboration continues to be very important after Nordea's relocation

Even though the banking sector domiciled in Sweden will become smaller if Nordea relocates to Finland, the vulnerabilities in the banking system and the risks towards which the banks are exposed within the household and housing sector and elsewhere are expected to persist (see the article "Consequences for financial stability of Nordea's relocation to Finland"). The Riksbank therefore deems, as before, that it is urgent that FI requires the major banks to have enough capital and liquidity. It is also important that, even after a relocation, Nordea retains capital and liquidity to the same extent as Swedish banks. Among other things, it is important that Nordea keeps sufficient liquidity reserves, including in Swedish kronor.

Following a relocation, Finland's responsibility for Nordea will increase. If Nordea relocates, it will no longer be the Riksbank but the Bank of Finland that will manage an application for emergency liquidity assistance from Nordea, even in Swedish kronor. Increased Nordic cooperation continues to be very important to ensure that the banks are covered by the same requirements so that competition does not become unbalanced and to coordinate matters such as liquidity supply.

The Basel III Accord has been completed

At the end of 2017, the Basel III regulatory framework was completed. This will contribute towards strengthening global financial stability. Basel III is therefore important for Sweden, which is a small and open economy with a large banking sector. It is important that the new regulations are not watered down but are implemented strictly. In addition, bearing in mind the risks in individual countries, it is also important that national supervisory authorities have the possibility to place additional requirements over and above international regulations.

A review of the relevant recommendations is presented below.

⁵² Consultation response on the Memorandum Further tools for macroprudential policy, April 2017. Sveriges Riksbank.

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.

As previously, the Riksbank considers that further measures are needed to reduce the risks of household debt and to increase household resilience.⁵³ Above all, the underlying reasons for the increasing indebtedness need to be addressed. The fact that the housing market is functioning poorly, for example due to the construction of new homes not corresponding to the demand, is an important cause of the indebtedness (see Chapter 2). Consequently, measures are needed that will contribute towards a better functioning housing market and that will create a better balance between supply and demand for housing.

One reason why the housing market is functioning poorly is that the rent-setting system creates supply limits and lock-in effects that make it difficult to find housing, particularly for young people and for people who are not yet established on the housing market. More rented accommodation would probably lead to the housing being constructed better corresponding to demand. In addition, it is important to have measures that lead to the existing housing stock being used more efficiently.

The taxation system also contributes to imbalances in the housing market. Taxation reforms are thus also needed to reduce households' willingness and ability to take on debt.

With regard to tax regulations for home-owners, these could be designed in different ways, either by regular taxation of the actual home or by taxing their purchase and sale. To reduce the lock-in effects and increase mobility in the housing stock, it is needed to review the capital gains taxation when homes are sold, property taxation and the current tax relief on interest expenditure.⁵⁴ This does not necessarily mean that total taxation must increase.

Other structural measures are also needed to create a better functioning mortgage market. One important measure would be to review the regulations for paying off mortgages earlier, so that more households have an incentive to choose loans with longer interest-rate fixation periods.⁵⁵ This would make households less sensitive to changed lending rates. Such a measure could be of particular importance after a long period of very low interest rates. Longer interest-rate fixation periods could also lead to the banks obtaining funding with

⁵³ For a description of how individual measures or different packages of measures affect households' aggregate debt-to-income ratio, see the *Financial Stability Report 2015:2*. Sveriges Riksbank.

⁵⁴ Sweden's tax loss for this tax relief amounted to around SEK 20 billion in 2016. This sum is expected to increase when interest rates rise.

⁵⁵ The Riksbank's consultation response to the ministry memorandum *Ränteskillnadsersättning m.m. vid bolån* (Interest rate differential compensation etc. in connection with mortgages), August 2013. Sveriges Riksbank.

longer maturities and thereby to a decrease of their structural liquidity risks.

Minimum requirements could also be set for banks' standard values in their discretionary income calculations,⁵⁶ which form part of their credit assessments. This would ensure that households hold greater economic buffers when they are granted mortgages.

It would be valuable to have a nationwide, comprehensive credit information service, where data on households' assets is available, including, for example, student loans as well as mortgage loans. Information from this type of credit information service could be used by both lenders and public authorities, for instance to analyse risks in the household sector and in the financial system. Such a system would also make it possible to calculate the total debt used as a basis for the debt-to-income ratio including all of the borrowers' loans. It would therefore be good if the possibility to provide such a service was investigated.

The Riksbank also deems that a central register for pledged tenant-owned homes should be set up to reduce the risk of individual households being impacted by economic losses in the event of 'hidden mortgages'. A system which insures that pledges are registered correctly is also important to ensure that investors' confidence in Swedish covered bonds continues to be high (see the article "Pledges for tenant-owned apartments need central register").

FI has adopted several macroprudential policy measures, most recently a stricter amortisation requirement, with the aim of reducing the risks of household indebtedness and increasing resilience. Going forward, further macroprudential policy measures may be necessary, depending on how effective already adopted measures prove to be. The measures that should be taken will in turn depend on how other changes in the housing market, such as tax regulations, are managed. One possible measure could be the introduction of a debt-to-income limit. This would ensure that households do not borrow too much in relation to their incomes.⁵⁷

It is important that relevant current and future macroprudential regulation covers all players on the mortgage market. All credit institutions shall thus be subject to the amortisation requirement, for example, and not just the mortgage-granting credit institutions covered by the Banking and Financing Business Act (2004:297).

A further possibility is to raise the risk-weight floor on mortgages from 25 per cent to, for instance, 35 per cent, which would mean that the banks need to allocate more capital for their mortgages.⁵⁸ This would strengthen the

Pledges for tenant-owned apartments need central register

When a household purchases a tenant-owned apartment, a mortgage agreement is usually signed, which pledges the tenant-owned apartment as collateral for the loan. Slightly simplified, this means that the bank has the possibility of seizing the tenant-owned apartment if the household is unable to repay its loan for some reason. At present, information on pledged tenant-owned apartments is not gathered into a central register. Instead, it is the board of the housing cooperative that is obliged to keep a register of any pledges in the cooperative.

Sector organisations and government enquiries have identified the lack of a central register as a potential problem. For example, there is a risk that housing cooperatives have inadequate hypothecation management routines. For an individual household, a poorly managed register of pledges can, in a worst-case scenario, lead to a situation in which the tenant-owned home is seized due to a previous owner not meeting their repayment commitments to the bank that has the right of pledge on the home.

Possible shortcomings in the housing cooperative's own register of pledges would be a problem as investors must be able to rely upon a pledge forming a secure claim. A system ensuring high reliability in pledging would ultimately contribute towards maintaining a high level of confidence in covered bonds, as loans against pledges in tenant-owned apartments are included in the underlying collateral volume linked to the covered bonds.

Just over 30 per cent of total lending with detached or semi-detached houses and tenant-owned apartments as collateral is made up of lending with tenant-owned apartments as collateral. Pledging should be as reliable as it is for detached or semi-detached houses in order to safeguard confidence in covered bonds and to reduce the risk of individual households being impacted by economic losses. The Riksbank's assessment is therefore that a central register should be introduced for pledged tenant-owned homes.

⁵⁶ Banks are already obliged to carry out credit checks to ensure that borrowers can fulfil their undertakings. As part of these checks, banks estimate so-called discretionary income calculations.

⁵⁷ Effects of a debt-to-income limit. Fact box in *Financial Stability Report 2016:2*. Sveriges Riksbank.

⁵⁸ *Financial Stability Report 2013:2*. Sveriges Riksbank.

banks' resilience. It would also correspond to what already applies for banks that use the so-called standard method to calculate risk weights for mortgages.⁵⁹

Banks' capital levels

Finansinspektionen should introduce a leverage ratio requirement for the major Swedish banks of 5 per cent.

There are a number of risks and vulnerabilities in the Swedish banking system that make it sensitive to shocks. To ensure resilience is high, it is therefore important that banks hold sufficient capital. The Riksbank considers that a non-risk-weighted capital requirement, in the form of a leverage ratio requirement, should be introduced as soon as possible for the major Swedish banks as a complement to the risk-weighted capital requirements, which suffer from deficiencies. A leverage ratio requirement ensures that banks hold a certain volume of loss-absorbing capital in relation to their total assets. According to the European Commission's proposal in the so-called banking reform package, a leverage ratio requirement of 3 per cent will be introduced within the EU.⁶⁰ This is in line with the minimum requirement for the leverage ratio that the Basel Committee agreed on earlier.

Several countries with large and interlinked banking systems have, however, already decided to introduce a national leverage ratio requirement higher than the coming international minimum level. A comparison with other European countries shows that banks in most other countries have higher average leverage ratios than Swedish banks (see Chart 2:15 in Chapter 2). Given the size and the vulnerabilities of the Swedish banking sector, Sweden should have a leverage ratio requirement higher than the coming international minimum. The Riksbank considers that the requirement should be set at 5 per cent at present.⁶¹

Calculations by the Riksbank indicate that a socioeconomically well-balanced level for the banks' leverage ratio is somewhere in the interval of 5-12 per cent.⁶² The calculations thereby provide support for the Riksbank's recommendation of a leverage ratio requirement of 5 per cent, at the same time as they indicate that a significantly higher requirement may be socio-economically profitable.

Finansinspektionen should set the countercyclical capital buffer value at 2.5 per cent.

The countercyclical capital buffer aims to strengthen the resilience of Swedish banks when systemic risks accumulate.

⁵⁹ International Convergence of Capital Measurements and Capital Standards, June 2006. Basel Committee of Banking Supervision.

⁶⁰ The implementation date has not been set, however.

⁶¹ According to the Basel Committee's definition.

⁶² Almenberg, J. et al. (2017), Appropriate capital ratios in major Swedish banks – new perspectives, *Staff Memo*, May 2017. Sveriges Riksbank. These calculations are not directly affected by the size of the banking system.

Based on the overall risk assessment in this and previous publications of the Financial Stability Report, the Riksbank has been recommending since 2014 that the countercyclical capital buffer should be raised to 2.5 per cent, considering the systemic risks that have accumulated over several years. This development is highlighted in, for example, Chart 2:16 in Chapter 2. The buffer value is currently 2 per cent and has been gradually increased from 1 per cent since the requirement was introduced in 2014.

Banks' liquidity risks

Finansinspektionen should set Liquidity Coverage Ratio (LCR) requirements in Swedish kronor and other significant currencies for the major Swedish banks.

At the start of the year, FI's regulations for the banks' LCRs ceased to apply and were replaced by the European Commission's delegated regulation on liquidity coverage requirements. The EU requirement does not cover minimum requirements in individual currencies, but FI will continue to set separate LCR requirements in euros and dollars. The Riksbank considers that LCR requirements should be introduced for all significant currencies, including Swedish kronor.

The Riksbank has previously recommended FI to set requirements for the LCR in Swedish kronor and to set the requirement to at least 60 per cent to ensure that the banks have a certain minimum level of liquidity in Swedish kronor. The new LCR definition differs from the old one in several respects, such as which liquid assets may be counted as part of the liquidity reserve and to what extent. The new definition means that some banks' LCR will automatically be higher without any improvement in their resilience. This provides one reason for investigating in the period ahead whether the requirement of 60 per cent previously recommended by the Riksbank should be raised. When setting a liquidity requirement, it is also important to ensure that the proportion of covered bonds in the liquidity reserve does not become too high.

It is equally important to have LCR requirements in all significant currencies to ensure that the banks' liquidity in these currencies does not fall too low.⁶³ This would also reduce the banks' dependence on the foreign exchange swap market and limit the contagion risk, should one bank encounter liquidity problems.

⁶³ The Basel Accord states that a bank shall have liquid assets that can meet the outflows in all significant currencies.

The major Swedish banks should continue to reduce their structural liquidity risks and continue to attain at least a Net Stable Funding Ratio (NSFR) of 100 per cent.

According to the Basel Committee's recommendation, the banks shall attain a minimum NSFR level of 100 per cent from 2018.⁶⁴ Over the period January 2017-January 2018, the four major Swedish banks had an average NSFR of 106 per cent. It is important to ensure that the banks continue to attain the minimum level.

At the same time, the NSFR does not fully reflect the banks' structural liquidity risks. The banks can fulfil the requirement while still taking relatively substantial risks. In contrast to the NSFR, if account is taken of the maturity structure of a bank's funding for maturities of over one year, it is clear that the major Swedish banks take greater structural liquidity risks than many other European banks. There is hence reason for the banks, with a large share of market funding, to continue to reduce their structural liquidity risks, for example by obtaining funding with longer maturities.⁶⁵

The major Swedish banks should report their Liquidity Coverage Ratios (LCR) in Swedish kronor and other significant currencies, together with their Net Stable Funding Ratios (NSFR), at least once a quarter.

The major Swedish banks already report every quarter their LCRs for all currencies combined and separately in euros and US dollars, but not in other significant currencies. The possibilities of assessing the banks' liquidity risks is thereby restricted and investors may find it difficult to price the risk they take in full. It is therefore important for the banks to report their LCRs for all significant currencies, including the Swedish krona, on a quarterly basis. To ensure that the reporting provides a true picture of the liquidity risks, it is important to see how the LCR levels have developed on a daily basis.

As regards the NSFR, Swedbank and Handelsbanken presently report the NSFR in their public reports. Other major banks should also increase transparency regarding their structural liquidity risks by reporting their NSFR.

⁶⁴ 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.

⁶⁵ The major Swedish banks' structural liquidity risks, *Riksbank Studies*, November 2016. Sveriges Riksbank.

ARTICLE – New players on the mortgage market

The Swedish mortgage market is undergoing some important changes. Loan brokers have gained increasing significance by helping mortgage borrowers to cut their borrowing costs, and non-bank lenders are competing with traditional banks for mortgage customers. The mortgage volumes these new players are managing are currently small, both in relation to the total annual flow and the outstanding volume. However, experiences from other countries suggests that these new players may become important players on the mortgage market. This could be positive for financial stability, for example if they use more stable funding sources than the banks. However, the new business models have not been tested in a declining mortgage market, which could entail new risks. New players could also complicate macro-prudential policy. It is therefore important that all future mortgages, regardless of lender, are subject to a thorough credit assessment and covered by current and future relevant macroprudential regulation.

The Swedish mortgage market

The Swedish mortgage stock is significant in relation to GDP (about 70 per cent) and mortgage lending to households amounts to about SEK 3,120 billion.⁶⁶ Mortgage lending in Sweden is primarily conducted by banks⁶⁷ which typically hold mortgages on their balance sheets. The mortgage market is concentrated and the four major banks account for 75 per cent of the total lending. The market is characterised by a high share of variable interest rate mortgages and a low level of credit losses.

To fund mortgage lending, banks mainly issue covered bonds which are typically bought by domestic and foreign investors such as insurance companies or pension funds. The size of the covered bond market is about SEK 2,160 billion and the average maturity of newly-issued bonds is five years.⁶⁸ As mortgage loans are rarely paid back fully, the current mortgage market embodies significant structural liquidity risks, something that the Riksbank has highlighted previously.⁶⁹

New players on the mortgage market

Recently, a number of new players have appeared on the Swedish mortgage market. These players are either loan brokers that connect borrowers with lenders or non-bank lenders that grant mortgages to create and manage investment products on the behalf of institutional investors.

Loan brokers match borrowers with lenders

The first type of new player, loan brokers, match borrowers with lenders and vice versa. For borrowers, loan brokers provide an effective way of cutting mortgage costs. This is typically done via online services that allow borrowers to compare their existing borrowing costs with alternative offers and to exchange their existing loans for more favourable ones. Lenders can use loan brokers to grow their mortgage businesses in a cost-effective manner. By screening various borrowers and making a first assessment of their creditworthiness, loan brokers provide lenders with access to a large pool of potential borrowers.

In Sweden, loan brokers that focus on mortgages is a relatively recent phenomenon. There are currently 39 loan brokers in Sweden, of which seven are specialised in mortgage loans.⁷⁰ The amount of mortgages intermediated by loan brokers is still small, but it is increasing rapidly. According to market surveys, mortgage brokers intermediated mortgages to a value of about SEK 20-25 billion in 2017.

Non-banks create investment products from mortgages

The second type of new player on the mortgage market is non-banks that grant mortgages with the aim of creating and managing investments on the behalf of institutional investors. A typical non-banking player has two different parts: one that issues mortgages and one that creates and manages investment products (see Figure A:1). The part of the business that grants mortgage loans does so under the

⁶⁶ Data from the end of 2017.

⁶⁷ The banks issue mortgages directly or via their wholly-owned mortgage institutions. Both banks and mortgage institutions operate under the Banking and Financing Business Act (2004:297), which means they must comply with special banking requirements related to capital, liquidity and funding.

⁶⁸ The average maturity of the outstanding stock of covered bonds is three years. Data from the end of 2017. See statistics from the Association of Swedish Covered Bond Issuers.

⁶⁹ For an in-depth description of structural liquidity risks, see *Financial Stability Report 2016:2*. Sveriges Riksbank.

⁷⁰ This categorisation is based on licences registered in FI's business register.

Mortgage Business Act (2016:1024).⁷¹ According to this Act, the lender may conduct mortgage lending without having a formal banking licence and without being subject to bank-like capital, liquidity and funding requirements. The lender normally follows its own internal credit terms, such as a maximum loan-to-value ratio, for the mortgages to qualify for a certain investment product. The lender works closely with an internal or independent loan broker to gain access to a large range of mortgages that fulfil the internal credit terms. To begin with, the loans are held on the lender's balance sheet. They are then sold on to investors in the form of various investment products.

An example of such an investment product is an investment fund that invests in mortgages with a certain credit quality. This mortgage fund buys mortgages from lenders and funds the purchase by issuing securities.⁷² Those who invest in the securities, insurance companies and pension funds for example, receive a flow of income from the underlying mortgages and are therefore directly exposed to the mortgages. The holders of the securities hence bear the full credit risk stemming from the underlying mortgages. The fund manager normally charges a fee for its services. Such a fee is normally deducted from the interest income before it is disbursed to investors.

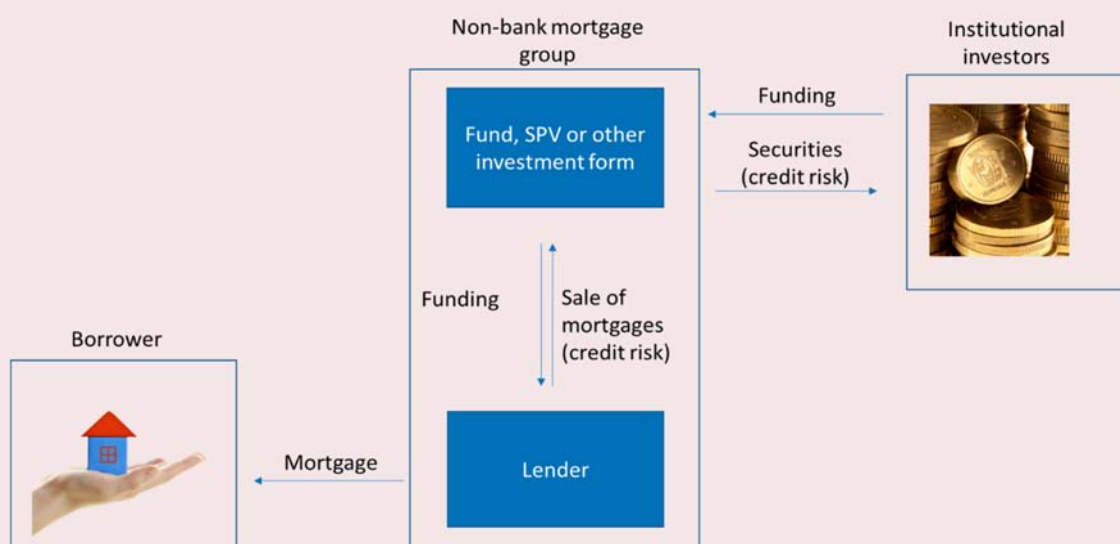
Another type of investment product can be created by securitising mortgages. The mortgage portfolio is then sold to a Special Purpose Vehicle (SPV). The SPV in turn issues bonds to fund the purchase of mortgages.⁷³ The bonds use mortgages as collateral.⁷⁴ Even in this case, the credit risk is borne by those investing in the bond.

In Sweden, the first non-bank mortgage players started their mortgage operations at the end of 2017. There are currently fewer than five players on the market and their mortgage volumes so far have been small in relation to the total annual flow and outstanding volume.

Common phenomenon in the Netherlands

Insurance companies and pension funds in the Netherlands have been active on the mortgage market for a long time.⁷⁵ After the financial crisis, banks reduced their supply of mortgages while insurance companies and pension funds wanted to increase their exposure to mortgages. This led to the establishment of the first investment funds with mortgages as collateral. Via direct lending, and with the help of these funds, insurance companies and pension funds doubled their exposure to household mortgages. At the end of 2016, they made up about 11 per cent of the total outstanding volume of mortgages in the Netherlands.

Figure A:1. Illustrative structure of a non-bank mortgage company



Source: The Riksbank

⁷¹ The Mortgage Business Act is the Swedish implementation of the EU Directive 2014/17/EU that regulates residential mortgage lending by banks and non-bank institutions in the European Union.

⁷² Such securities can be designed as fixed income securities with an economic profile similar to fund shares. The nominal value of these securities and interest payments would in this case depend on the economic performance of the fund, as is the case

for fund shares. Since these securities would also have a maturity, the fund would need to buy back these securities when they expire.

⁷³ Eliasson, E. Rydén, A. (2014) Securitisation – background, new developments and possible consequences, *Economic Commentaries* No. 10. Sveriges Riksbank.

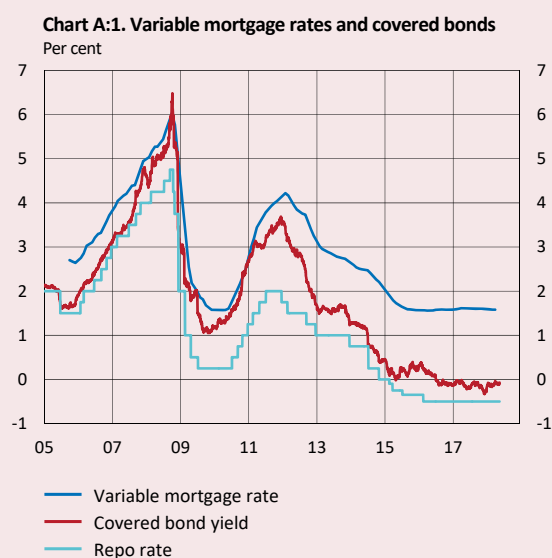
⁷⁴ Mortgage-backed securities (MBS).

⁷⁵ Loan markets in motion. Larger role of pension funds and insurers boosts financial stability, 2016. De Nederlandsche Bank.

Factors that drive the emergence of new players

There are several reasons why new players have entered the Swedish mortgage market. One reason is that direct exposure to mortgages offers investors attractive returns, especially in relation to other comparable assets, such as covered bonds (see Chart A:1). The average variable interest rate for outstanding mortgages is currently about 1.6 per cent, for example. This can be compared with yields on covered bonds, which are currently close to zero. The extra yield that investments in mortgages offer over covered bonds reflects in part a higher risk for credit losses and worsened liquidity. But it also reflects banks' increased mortgage margins after the financial crisis.⁷⁶

The increased demand for mortgages from institutional investors may also be a consequence of recent changes in certain regulations. Mortgages are now treated more favourably than covered bonds when calculating the capital requirements of certain types of insurance companies, making them particularly attractive for insurance company investors.⁷⁷



Note. Mortgage rate is based on outstanding mortgages. Yields refer to covered bonds with five-year maturities and variable coupons.

Sources: Statistics Sweden and the Riksbank

Digitalisation is another driver behind the recent changes on the mortgage market. In Sweden, competition on the mortgage market has been weak for a long time.⁷⁸ This has, to a high degree, affected customers, who have found it time-consuming and troublesome to negotiate with different loan providers. Loan brokers have used digitalisation to drastically reduce the search and

negotiation costs for borrowers, and have created greater transparency and competition on the market. More mobile customers have helped the growth of smaller but more competitive banks as well as facilitated the entry of non-bank lenders. Digitalisation has also led to lower costs for lending, which has reduced the disadvantage that smaller players previously had in relation to larger players due to economies of scale.

Another important factor that has facilitated changes on the mortgage market is that mortgages are a standardised product. Credit risk assessment for mortgages has been standardised and, to a greater extent, automatised and banks no longer have the unique advantage of screening and monitoring borrowers via their bank accounts. Access to “big data” in combination with efficient use of information has instead led to a competitive edge for technically advanced players. The handling of non-performing mortgages is also becoming increasingly standardised and non-bank lenders can use specialised debt collection firms for this purpose.

Finally, the implementation of certain legislative changes has also facilitated the entry of non-bank lenders into the mortgage market. The Mortgage Business Act (2016:1024) has made it easier for different players to conduct mortgage lending without the need to have a traditional bank license. This has lowered the entry barriers to the mortgage market, since these players do not have to comply with the same regulations as banks.

Financial stability implications

Greater competition leads to lower debt-servicing costs

The increasingly prominent role of loan brokers in combination with the entry of non-bank mortgage lenders will increase competition on the mortgage market. Increased competition is likely to lead to lower mortgage rates, especially for those borrowers that pay relatively high interest rates in relation to their creditworthiness. Lower mortgage rates reduce borrowers' debt servicing costs and increase their ability to repay existing debt. Lower mortgage rates can also increase the demand for new mortgages, leading to increased indebtedness. How much the borrower is allowed to borrow, however, is also determined by the borrower's income and other credit conditions.

⁷⁶ Stricter capital requirements together with low and falling risk-free interest rates in the post crisis period entailed lower returns on equity for the banks. Banks managed lowered profitability, at least partially, by increasing their mortgage margins. See for instance The banks' margins on mortgages, fourth quarter 2017. Finansinspektionen.

⁷⁷ Under the Solvency II delegated regulation (2015/35), a low LTV mortgage (below 60 per cent) is favourably treated compared to covered bonds when calculating the insurance company's capital ratio.

⁷⁸ Weak competition on the Swedish mortgage market is among other things reflected in an abnormally high share of borrowers paying listed interest rates (see Under Siege, 2016. SEB Equity Research).

Lower profits and potentially longer interest-rate fixation periods

Lower mortgage rates also lead to somewhat lower profits for the existing mortgage lenders, all other factors being equal. For instance, a fall in mortgage rates by 10 basis points may reduce major banks' net profits by 2 to 4 per cent, depending on how much of their total lending is made up of Swedish mortgages. While lower profits typically worsen the ability of banks to withstand adverse shocks, abnormally high profits due to low competition is an ineffective measure to promote financial stability.⁷⁹ Therefore, somewhat lower but more sustainable profits from mortgage lending should not jeopardise financial stability.⁸⁰

In the Netherlands, there has been downward pressure on mortgage rates, particularly within segments with longer interest-rate fixation periods, which can partly be linked to new players on the mortgage market.⁸¹ If interest rates fall in such a segment, it may reduce the high proportion of variable-rate mortgages, thereby making households less sensitive to unexpected rate rises.

Lower concentration risks, more diversified supply of mortgages and potentially lower refinancing risks

Greater competition can also lead to lower concentration on the mortgage market. Currently, the four largest banking groups control about 75 per cent of the mortgage market. Loan brokers help smaller mortgage providers to grow faster than the existing larger players. This leads to a reduction in concentration and could give the four major banks a less dominant role in the long term.

Non-bank lenders also complement banks' supply of mortgages and lead to a transition from a bank-oriented mortgage system to a more market-based system, which in turn leads to the credit risk being directly borne by investors instead of by the banks' owners. An additional source of funding can also make the supply of mortgages more resilient, reducing the risk of a credit crunch.

A more market-based mortgage funding with long maturities would also reduce structural liquidity risks on the mortgage market. Non-bank lenders issue mortgages on behalf of institutional investors such as insurance companies and pension funds. These investors are typically interested in long-term investments, which make them suitable for mortgage funding. Banks issue covered bonds with the average issuance maturity of five years,

while some non-bank lenders use funding instruments with ten-year maturity.

New non-standardised business models can create new risks and complicate macroprudential policy

At the same time as the new players can be expected to have a certain positive effect on financial stability, they also bring new risks and challenges. These new non-bank business models are currently non-standardised. Credit terms, as well as the maturity and design of funding instruments, can vary across different players, and change over time. It is therefore possible that some of these new players may start competing with less favourable underwriting standards or create products that increase rather than decrease liquidity risks in the system.

Neither have the new business models been tested in a declining mortgage market. It remains to be seen how these new players manage downturns when the number of non-performing mortgages can potentially increase dramatically. The risk exists that these businesses will be less able to manage a large number of non-performing mortgage loans than traditional banks with experience of economic downturns. It also remains to be seen how they cope with periods in which institutional investors' willingness to invest in mortgage loans decreases rapidly. In such a scenario, mortgages already issued by lenders but not yet sold on to institutional investors need to be disinvested with unfavourable terms, for example in the form of a fire sale. This can lead to a credit crunch or create other stability risks. Neither do these players have the same access to a central bank's liquidity facilities as banks do.

Finally, it should be mentioned that non-bank lenders are currently not covered by macroprudential policy measures, such as the amortisation requirement, which apply to banks as mortgage issuers. However, FI has referred a proposal to expand the scope of application for the amortisation regulations to cover companies licensed to issue mortgage loans in accordance with the Mortgage Business Act.⁸² It is important that all future mortgages are subject to a thorough credit assessment and are covered by current and forthcoming relevant macroprudential policy regulations, and not just mortgages issued by credit institutions that are covered by the Banking and Financing Business Act (2004:297).

⁷⁹ A large share of these profits is typically paid out to shareholders via dividends and share buybacks. Furthermore, there are other more effective ways to safeguard financial stability, such as capital requirements, for instance.

⁸⁰ The relationship between competition and financial stability is probably non-linear. According to empirical research, a move from low competition to an intermediate level of competition can be considered as stability enhancing. However, after a certain point, an increase in competition will result in excessive competition,

undermining financial stability. For more information, see for instance Vives, X. *Competition and Stability in Banking*. Princeton University Press.

⁸¹ Loan markets in motion. Larger role of pension funds and insurers boosts financial stability, 2016. De Nederlandsche Bank

⁸² Proposals: Regulations on amendments to FFFS 2016:16 on the amortisation of loans with housing as collateral. Finansinspektionen.

ARTICLE – Consequences for financial stability of Nordea's relocation to Finland

In September 2017, the Board of Directors of Nordea Bank AB made the decision to move the parent company to Finland and thereby to the banking union. The decision was approved by the Nordea general meeting of shareholders in March this year. Nordea's relocation could have significant consequences for the Swedish financial system and for Swedish financial stability. A relocation reduces Sweden's responsibility for Nordea, but also its control of and oversight into the bank. In the long run, when the banking union is fully completed, more intensive supervision and increased risk diversification among the countries in the union may lead to lower risks for Sweden. However, the banking union is not fully developed and so far, a large part of the responsibility for managing problems in a bank still lies with the individual member state. If Nordea relocates, Finland will thus have to shoulder this responsibility. One precondition for a relocation not to risk financial stability in Sweden is that Nordea's capital and liquidity requirements will not become lower as a result of the move.

If Nordea relocates to Finland, the bank becomes a part of the Single Supervisory Mechanism (SSM), where the ECB is in charge of the supervision of the significant banks. The relocation, which is planned for 1 October this year, requires that the ECB approves the application for a bank licence for the newly-formed Finnish subsidiary and that Finansinspektionen (FI) in Sweden approves the requested merger. The move is planned to be implemented via a reverse cross-border merger in which the parent company will be merged with a newly formed Finnish subsidiary. This article discusses the aspects of Nordea's relocation deemed to be most relevant from a financial stability perspective and the conditions that should be fulfilled to ensure that a move will not pose a heightened risk of financial instability.

Concentration and interconnectedness will remain

The Swedish banking system's total assets currently correspond to around 400 per cent of GDP.⁸³ A relocation of Nordea's head office would lead to a reduction in the Swedish banking system's assets to around 300 per cent of Swedish GDP. The banking system would thus remain large in relation to Sweden's economy. At the same time, assets in Finland's banking system will more than double in size, from around 200 per cent to around 400 per cent of Finland's GDP.⁸⁴

Nordea is currently one of the largest agents in Sweden with about 30 per cent of the Swedish banking system's total assets. After a relocation, Nordea will continue to conduct operations in Sweden in a newly-opened branch, as well as through the five existing subsidiaries.⁸⁵ After the move, Nordea's share of the Swedish banking system's assets is expected to decrease to less than 10 per cent. It can be noted that, after a move of Nordea to the banking union, about three-quarters of the bank's assets would still be outside the banking union, in Sweden, Denmark and Norway.

As a result of the move, Swedish authorities' formal commitments and responsibilities towards, as well as oversight and control of, the Nordea group, including the Swedish branch, will decrease. Nordea's actual operations in Sweden will nevertheless be largely the same. Thus, the risks associated with concentration and interconnectedness in the Swedish banking system will remain.

The ECB assumes responsibility for microprudential policy

At present, FI has the responsibility for Nordea's microprudential supervision and chairs Nordea's supervisory college.⁸⁶ The ECB and the Finnish financial supervisory authority are also members of the college, as they currently exercise supervision of Nordea's Finnish branch and Finnish subsidiaries respectively.

⁸³ The term 'the Swedish banking system' refers to MFIs according to Statistics Sweden's definition and their total bank assets in Sweden, including bank branches and subsidiaries active in Sweden under foreign management, as well as Swedish banks' branches abroad.

⁸⁴ The 200 per cent figure includes Nordea's current Finnish branch, and 400 per cent includes the entire Nordea Group, including foreign subsidiaries.

⁸⁵ Nordea's Swedish subsidiaries include Nordea Hypotek AB, Nordea Finans Sverige AB, Nordea Investment Management AB, Nordea Asset Management Holding AB and Nordea Livförsäkring Sverige AB (part of Nordea Life Holding). None of these subsidiaries are funded through deposits.

⁸⁶ For banks with operations both within and outside of the banking union, supervision is conducted via so-called supervisory colleges, consisting of the supervisory authorities in the countries in which the banking group has operations.

Following a relocation of Nordea's head office to Finland, the ECB would assume responsibility for Nordea's microprudential supervision, including for the new Swedish branch, since the authority has the supervisory responsibility for the banking union's significant banking groups (about 118 banking groups at present).⁸⁷ Within the SSM, joint supervisory groups, consisting of personnel from both the ECB and the national supervisory authorities, are responsible for supervision of all significant banks.⁸⁸ The aim is to develop a uniform supervisory culture, with consensus as regards the assessment of risks, methods and processes.

FI will continue to be the supervisory authority and make decisions for the Swedish subsidiaries, including Nordea Hypotek AB. FI will thus also be able to be involved and influence decisions in the supervisory college regarding, for example, capital and liquidity for the entire group. However, final rulings for the entire group will be made by the ECB if the supervisory college fails to reach agreement.

Finland assumes responsibility for macroprudential policy

If Nordea relocates to Finland, the Finnish supervisory authority will become responsible for the bank's macroprudential policy. This means that macroprudential policy measures introduced by the Finnish supervisory authority will also apply to Nordea's branch in Sweden.

Macroprudential measures that have already been adopted by FI and which have their roots in consumer protection and that are based on national legislation, such as the loan-to-value limit and amortisation requirement, will also apply to Nordea's branch in Sweden in the future. On the other hand, other macroprudential measures adopted in Sweden to safeguard Sweden's financial stability will not automatically apply to Nordea's branch in Sweden, as it will fall under the responsibility of the Finnish supervisory authority. For these measures to apply, recognition of reciprocity would be needed from the Finnish supervisory authority and the ECB. The Governing Council of the ECB can also set higher macroprudential policy requirements than national authorities do.

Capital requirements should not be lower

Nordea is currently subject to Swedish capital requirement regulations (see Table B:1). However, the minimum requirement and the capital conservation buffer (corresponding to a total of 7 per cent of risk-weighted assets) constitute internationally agreed requirements.

Nordea's other CET1 capital requirements are Swedish special requirements.

FI thus makes use of special requirements to manage, among other things, macroprudential risks. On the other hand, the ECB strives to harmonise the banks' capital requirements and to reduce the use of special requirements justified by systemic risks, as macroprudential policy measures. It is therefore not clear whether it will be possible to achieve reciprocity for macroprudential policy measures that currently constitute Swedish special requirements, such as the risk-weight floor for mortgages.

Table B:1. Nordea's capital requirements, Q4 2017

Capital requirement, per cent of risk-weighted assets

Minimum requirement	4.5%
Capital conservation buffer	2.5%
Systemic risk buffer	3.0%
Countercyclical capital buffer	0.7%
Pillar 1 requirements	10.7%
Systemic risk	2.0%
Risk-weight floor, Swedish mortgages	1.2%
Capital requirement, Norwegian mortgages	0.4%
Other Pillar 2 requirements	3.3%
Pillar 2 requirements	6.8%
Total capital requirements	17.5%
Actual CET1 capital ratio	19.5%

Note. Only the minimum requirement and the capital conservation buffer constitute internationally agreed requirements. Nordea is also subject to a CET1 capital requirement as a globally systemically important bank, which is included in the systemic risk buffer. The countercyclical capital buffer corresponds to 2 per cent of risk-weighted assets but only applies to Nordea's Swedish exposures. If a bank contravenes Pillar 1 requirements, it may lead to restrictions on share dividends (buffer requirements) or licence revocation (minimum requirement). Pillar 2 requirements are not currently formal requirements.

Source: Finansinspektionen.

However, the Finnish supervisory authority can use the scope for national discretion that exists in the banking union, which implies that it is possible to set higher capital requirements than the general requirements within the SSM. A new Finnish law from 1 January 2018 allows the Finnish supervisory authority to set a systemic risk buffer of between 1 and 5 per cent. However, it would require the approval of the European Commission if the systemic risk buffer were to be set above 3 per cent.

All in all, the shape of Nordea's future capital requirements is currently unclear as these will be determined by ECB and the Finnish supervisory authority. The Riksbank considers it a precondition that Nordea's capital requirements do not decrease in conjunction with a relocation, as Nordea's operations are expected to continue, and the risks related to concentration and

⁸⁷ The criteria for significant banks are reported in Council Regulation (EU) 1024/2013 and in the ECB's Regulation 468/2014.

⁸⁸ FI invests significantly fewer resources on the supervision of the major banks compared with the SSM. See Sweden, *Financial Sector Assessment Program*,

interconnectedness will therefore remain. Lower requirements for Nordea would also give it a competitive advantage over banks still under Swedish supervision.

Important that liquidity requirements remain

As from this year, all banks in the EU are subject to joint regulations for how much liquid funds banks must retain overall. In addition, FI places special requirements on liquid funds in euros and US dollars to strengthen the resilience of Swedish banks. With Nordea's relocation to the banking union, responsibility for setting liquidity requirements will be transferred to the ECB. The Riksbank considers it important that all banks in Sweden, including Nordea, continue to have liquidity requirements in all significant currencies, in order to counteract short-term liquidity risks.⁸⁹ Along with Swedish kronor, US dollars and euros, which are significant currencies for all the major Swedish banks, the British pound and some of the Nordic currencies are also significant for certain banks, albeit to a varying extent.

A common deposit guarantee system is not in place

The deposit guarantee system reimburses depositors in financial institutions in the event that an institution enters into bankruptcy. The deposit guarantee is funded through fees from the affiliated institutions which are invested in a fund. Current EU regulations require the national deposit guarantee funds to amount to at least 0.8 per cent of guaranteed deposits by 2024 at the latest.

The Swedish deposit guarantee system is administered by the Swedish National Debt Office. At the end of 2017, the Swedish deposit guarantee fund amounted to SEK 40.1 billion. This corresponds to 2.4 per cent of guaranteed deposits from 31 December,⁹⁰ which is almost three times what the EU directive requires.

The banking union's third pillar – together with the joint supervision and resolution cooperation – is intended to consist of a joint deposit guarantee system with a joint deposit guarantee fund. However, it is uncertain at present when the banking union's deposit guarantee system will be in place and how it will be designed, including the size of the deposit guarantee fund.

Assets in the Finnish banking system will more than double if Nordea moves to Finland. It will also entail a substantial increase of the Finnish deposit guarantee system's commitments in that the entire Nordea group's guaranteed deposits will fall under the responsibility of

the Finnish deposit guarantee system until further notice.⁹¹ As a share of guaranteed deposits the Finnish deposit guarantee fund, will thereby be reduced while the Swedish deposit guarantee system will be strengthened.

It can be noted that, should Nordea fail, the bank would, in all likelihood, be put into resolution (see below) and would thereby not need to rely on the deposit guarantee system. During a resolution process, parts or all of the institution is kept open so that depositors and other customers have access to their accounts and other services, which means that the deposit guarantee would not need to pay out compensation to depositors. However, a strong deposit guarantee system is generally considered important in order to guarantee that the banking system is stable in times of uncertainty.

The resolution fund is being set up

Resolution involves central government assuming control of a failing bank to allow reconstruction or settlement of operations in a controlled manner, without negative effects for financial stability. For the funding of resolution measures, there has to be a resolution fund that is built up based on fees from the banks. The aim is that the bank's owners and creditors shall primarily assume the cost of the procedure – not the taxpayers.

The domicile determines which country has responsibility for resolution, meaning that, at present, the Swedish National Debt Office has the responsibility for any resolution of Nordea. There is no actual resolution fund in the Swedish resolution system. Resolution fees from the banks are placed in a special account for the so-called resolution reserve. However, the money is available to cover central government's current expenditure. The government then incurs a liability to the resolution reserve to a corresponding extent. The resolution reserve can therefore be seen as a claim on central government that can be called on when the need arises. So far, a total of about SEK 30 billion has been paid in, corresponding to 1.7 per cent of guaranteed deposits off 31 December 2016. The aim is for the Swedish resolution reserve to amount to 3 per cent of guaranteed deposits.⁹²

If Nordea carries out its relocation as planned, responsibility for the resolution of Nordea's parent company will be transferred to the banking union and the joint resolution authority, the Single Resolution Board (SRB)⁹³ The SRB is responsible for both systemically

⁸⁹ See Chapter 2 for a discussion on significant currencies and the new requirements for liquidity coverage ratios (LCR).

⁹⁰ The value of the guaranteed deposits is from the end of 2016, i.e. before Nordea transformed its Nordic operations into branches, which made the Swedish deposit guarantee fund responsible for deposits in Sweden, Denmark, Finland and Norway. In other words, the size of the Swedish deposit guarantee fund, as a proportion of guaranteed deposits, is currently lower than this. Nevertheless, the minimum requirement has still been more than fulfilled.

⁹¹ In the event of a move, the general public's deposits in Nordea (up to EUR 100,000 or about SEK 1,000,000) will be protected by the Finnish deposit guarantee. In conjunction with the relocation, Nordea's paid fees from the last year would be transferred from the Swedish to the Finnish deposit guarantee fund.

⁹² At present, the Swedish National Debt Office's resolution reserve has a borrowing limit of SEK 100 billion and a guarantee limit of SEK 200 billion.

⁹³ After the relocation, it will still be possible for Nordea's Swedish subsidiary to be wound up or entered into bankruptcy or resolution in accordance with Swedish law.

important banks and cross-border banking groups, criteria that the new Nordea parent company will fulfil.

Within the banking union, there is a joint fund, the Single Resolution Fund (SRF), which can contribute with funding during a resolution procedure. However, this fund is still being set up and is not expected to be fully set up until 2024 at the earliest. The aim is for the fund to have a value of 1 per cent of guaranteed deposits, the equivalent of EUR 55 billion. In 2017, the fund contained about EUR 17.4 billion, corresponding to about 0.3 per cent of guaranteed deposits.

Until the SRF is fully developed, it is divided into national departments based on each country's deposits. Each country is allowed to take a successively smaller proportion of funding from its own national department and an successively larger proportion from the joint funds until finally, in 2024, all funding of resolution processes comes from the SRF.⁹⁴ Until then, Finland would thus have to bear considerable economic responsibility for any resolution of Nordea.

Bank of Finland expected to provide emergency liquidity assistance

Nordea bank Abp, the new Finnish parent company, will probably apply to become both a RIX participant and a monetary policy counterparty to the Riksbank. As RIX participant, Nordea Bank Abp's Swedish branch will have access to the Riksbank's intraday credit and, as monetary policy counterparty, it will have access to the so-called standing facilities, which is to say overnight lending and deposits in Swedish kronor. These two are the Riksbank's normal liquidity facilities.

As the Riksbank has emphasised many times, it is important for banks to, first and foremost, manage their own self-insurance by holding adequate liquidity reserves. If, despite everything, a situation arises in which Nordea needs to be supplied with liquidity, the responsibility lies with the Bank of Finland, which will be expected to manage an application for emergency liquidity assistance from Nordea, including its foreign branches, even as regards liquidity in Swedish kronor.⁹⁵ Even if the responsibility lies with Bank of Finland, there are still legal possibilities for the Riksbank to assist as a last resort with extraordinary liquidity facilities in a crisis situation.

Greater risks for financial stability in the short run

Fully developed, the banking union should be able to contribute to a more robust European banking system with significant risk-sharing among the participating

member states, more intensive supervision without national 'home bias',⁹⁶ a joint deposit guarantee system and a joint resolution fund. In the long run, a relocation of Nordea's parent company to Finland could thereby reduce the risks that may jeopardise financial stability in Sweden.

As regards supervision, the SSM is largely already in place, with joint supervisory groups. At the same time, there is political disagreement on the elements of the banking union most clearly aimed at sharing the risks among the participating member states. For example there is still no final guarantor for the Single Resolution Fund, which could lead to problems in the event of large payouts. From a risk-sharing perspective, it can also be noted that, as yet, a relatively small part of the fund is available for joint financing. Neither has it been possible to reach an agreement on a single European deposit guarantee system, which means that depositors are still dependent on their own member state's ability to guarantee the system.

The banking union is therefore not fully developed and a substantial part of the responsibility for managing banking problems within the banking union still lies with the individual member state. If Nordea relocates its main office, this would mean increased responsibility for Finnish authorities and, ultimately, for Finnish taxpayers.

A condition for a relocation to be implemented without leading to increased risks for financial stability is that Nordea's capital and liquidity requirements do not become lower as a result of the relocation. Apart from lower resilience, lower requirements can also give Nordea competitive advantages over Swedish and Nordic banks, which may lead to greater risk-taking both by Nordea and the Swedish banks and hence to negative effects for financial stability.

The move highlights problems surrounding the authority of home countries and host countries for foreign bank branches and the importance of host country authorities having sufficient insight into the supervision and resolution plans for the entire banking group. For Sweden, the relocation implies a substantial reduction in not only the responsibility for a systemically important financial institution in Sweden, but also the control and insight as regards supervision, deposit guarantee and resolution for the entire group. This, in turn, may lead to reduced scope for safeguarding Swedish interests, which may increase stability risks in Sweden in a crisis situation. Increased cooperation and information exchange between the Nordic countries in terms of supervision and liquidity provision continues to be very important.

⁹⁴ The Finnish national department currently amounts to about 2 per cent of the funds collected by the SRF.

⁹⁵ *Memorandum of Understanding on Cooperation regarding Banks with Cross-Border Establishments between the Central Banks of Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway, and Sweden*, December 2016.

⁹⁶ "Home bias" refers here to the tendency to turn a blind eye to problems on the domestic front.

ARTICLE – Interconnectedness in the Swedish financial system

In recent decades, the financial system has become increasingly advanced and complex. This article aims to provide a picture of the central players in the Swedish financial system, how the central infrastructure systems work, what interconnections there are and what risks these may pose. The Riksbank's assessment is that there are particular risks and vulnerabilities due to individual central players being closely interconnected. It is therefore important to carefully monitor the development within this area and which implications it has for financial stability.

An interconnected financial system poses risks

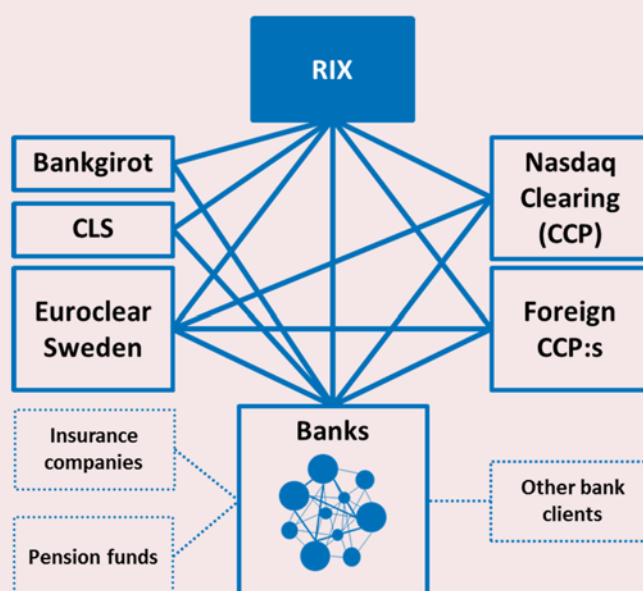
The financial system is central to the functioning and growth of the economy. At the same time, it is sensitive to shocks. This is partly because central parts of the financial system, such as banks and financial markets, have intrinsic vulnerabilities.⁹⁷ Furthermore, the different parts of the system, players and infrastructure systems, can be more or less interconnected with each other, for example, via various types of financial exposures, such as loans or derivative contracts that directly link financial players together. Financial players can also be indirectly interlinked via the ownership of similar assets or their dependence on the same infrastructure.

Interconnectedness means that problems arising in one part of the system can quickly spread to other parts and players.⁹⁸ This can have serious consequences for financial stability in the system as a whole, with potentially large costs to society as a result. It is therefore also important to identify and consider this interconnectedness when analysing the stability of the financial system. Many analysts, including the Federal Reserve, FSB, CPMI, IOSCO and BIS⁹⁹ have highlighted and analysed this interconnectedness from a financial stability perspective.¹⁰⁰

Systemic risk is linked both to the risk associated with individual players and to how this risk can spread in the system through interconnections. It is hence important that all players and links in the system function well and minimise the risks so that the system as a whole is stable.¹⁰¹ A general description of the central players in

the Swedish financial system and how they are interconnected is given below (see Figure C:1).¹⁰²

Figure C:1. A simplified illustration of links between players in the financial system, focusing on the infrastructure



Source: The Riksbank

The Swedish financial infrastructure¹⁰³

The financial infrastructure is an important component of the financial system. It consists of systems through which payments are made and transactions with financial instruments are handled. The infrastructure makes it possible for individual households, companies and authorities to perform payments in a safe and efficient

⁹⁷ See Chapter 2.

⁹⁸ Glasserman, P. and Young, H.P. (2016), Contagion in Financial Networks, *Journal of Economic Literature* 2016, 54(3), 779-831 for a research review of contagion risks in financial networks.

⁹⁹ FSB: Financial Stability Board. CPMI: Committee on Payments and Market Infrastructures IOSCO: International Organisation of Securities Commissions. BIS Bank for International Settlements.

¹⁰⁰ Analysis of Central Clearing Interdependencies, July 2017. BIS, CPMI, FSB and IOSCO. See also Yellen, J. (2013), Interconnectedness and Systemic Risk: Lessons from the Financial Crisis and Policy Implications, *Speech at the American Economic Association*. Board of Governors of the Federal Reserve System.

¹⁰¹ For a review of the risks associated with individual players, see Chapter 2.

¹⁰² The chart does not, however, show the significance of individual players in the financial system or the degree of interconnectedness between the various participants in the system. This is because the data on interconnectedness is either inadequate or not in the public domain. As mentioned previously, interconnectedness can also take different forms. This means that it can be difficult to compare different types of infrastructure system and exposure with each other. Some players are also alone in their role, which means that the degree of systemic importance cannot be measured by, for example, a financial flow.

¹⁰³ For a detailed overview of the Swedish financial infrastructure, see *The Swedish Financial Market 2016*. Sveriges Riksbank.

manner. It also makes it possible to safely and efficiently pay for and deliver shares, debt securities and other financial instruments traded on the financial markets. The financial infrastructure thereby plays a central role and is a prerequisite for the functioning of the financial system.

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 systems are dependent on each other to be able to function without disruptions.

The Riksbank has identified the Riksbank's own payment system for large payments (RIX), Nasdaq Clearing, Euroclear Sweden and Bankgirot as systemically important and critical systems in Sweden.

RIX

RIX is an important hub in the financial infrastructure as basically all large payments in Swedish kronor between banks and the various infrastructure systems are settled¹⁰⁴ via this system. In 2017, transactions for just over SEK 13,000 billion were performed every month.¹⁰⁵ From a financial stability perspective, however, the number of transactions is not the crucial aspect. The key aspect is that most payments go via RIX, and this set-up has been the same for a long time.¹⁰⁶

Euroclear Sweden

Clearing is a central concept as regards financial infrastructure and involves the compiling of instructions and information about transactions.

Euroclear Sweden is an infrastructure system that offers clearing and settlement services and operates Sweden's central securities depository. Among other things, the system is used for securities transactions and the storage of securities in electronic form. Euroclear Sweden also makes it possible for players to use their securities to pledge collateral, which is of central importance for a functioning market. Collateral is needed, for example, for a loan between banks, to borrow from the Riksbank or for central counterparty clearing, which is described in the next paragraph. When a securities transaction is settled, securities are exchanged for liquid funds simultaneously. Cash settlement is done in central bank money on Riksbank accounts,¹⁰⁷ i.e. without credit risk. On average, equity transactions for SEK 46 billion are settled per day and the equivalent of SEK 436 billion in fixed-income market transactions. From a financial

stability perspective, however, the key aspect is not the number of transactions but rather the fact that Euroclear Sweden is currently alone in its role on the Swedish market.

Bankgirot

Bankgirot is Sweden's payment system for retail payments,¹⁰⁸ where mostly payments between households and non-financial corporations are compiled and cleared. The banks are participants in Bankgirot and submit payment instructions from their customers. Ultimately, Bankgirot's payments also go via RIX. An average of over four million transactions to a total value of SEK 53 billion are cleared through Bankgirot's system each bank day.

Nasdaq Clearing

Nasdaq Clearing is known as a central counterparty (CCP). As a CCP, Nasdaq Clearing takes over the counterparty risk¹⁰⁹ that transactions between two players would otherwise involve. Nasdaq Clearing conducts central counterparty clearing for different types of derivatives and for repos. The last part of this article describes in more detail the role played by a CCP in the financial system.

Stability risks primarily arise as a result of mutual financial dependencies between CCPs and CCP participants, mostly banks. This is a difference compared with the other infrastructure systems where it is mainly operational risks that constitute a stability risk.

International infrastructure systems

There are also some international central counterparties operating on the Swedish market, including London Clearing House (LCH). They offer clearing for both interest rate derivatives and equities. Other examples are EuroCCP and SIX x-clear, who offer clearing for equity transactions.

Another important international system is CLS Bank International. CLS reduces the risk in a foreign exchange transaction by the parties involved in the transaction first paying their respective exchange amounts into CLS. Then, once the money of both parties has been received, CLS simultaneously transfers the exchange amounts to the parties (known as "payment-versus-payment"). CLS payments in Swedish kronor are settled in RIX.

¹⁰⁴ Final regulation of claims between or within account operators, which is to say the transfer between accounts by which the transaction is considered to have been concluded.

¹⁰⁵ The figure represents an average for the whole of 2017.

¹⁰⁶ The current version of the RIX system was brought into operation in February 2009, although earlier versions of RIX have also fulfilled the same function.

¹⁰⁷ The Riksbank has also tasked Euroclear Sweden to administrate accounts used for the settlement of securities transactions, so that the funds deposited in Euroclear Sweden's accounts constitute a claim on the Riksbank.

¹⁰⁸ A retail payments system handles payments of relatively small amounts made in large numbers, most often between private individuals, companies and authorities.

¹⁰⁹ Counterparty risk refers to the risk that the counterparty, in, for example, a derivative contract, cannot fulfil its payment obligations.

The major Swedish banks

The four major Swedish banks are key players in the Swedish financial system and are responsible for the vast majority of all transactions in the Swedish financial infrastructure. For example, in 2017, the four major banks accounted for about 80 per cent of all RIX transactions and 65 per cent of the total turnover.¹¹⁰ The banks perform some transactions on their own behalf, but they perform the majority in their capacity as an agent for private individuals, companies and financial institutions that do not have direct access to the infrastructure themselves. In turn, the banks are tightly interlinked,¹¹¹ which means that problems in one bank can easily spread to other banks and ultimately also affect the functioning of the financial infrastructure. All banks, and particularly the four major banks, hence play a key role in the Swedish financial infrastructure in several respects.

Insurance companies and investment funds

There are also other key players in the Swedish financial system that are not as tightly interlinked with the Swedish infrastructure systems. These instead use banks as agents in order to access the infrastructure. Two examples of such key players are insurance companies and investment funds. These are interlinked with the banks in several ways, not just because the banks act as their agents. For instance, they hold large quantities of the major banks' covered bonds (see Chart 2:9 in Chapter 2).

Interconnectedness between banks and CCPs

The mutual financial link between banks and CCPs is described here in order to clarify how agents and infrastructure systems can be interconnected.

As described above, a CCP acts as an intermediary in different types of financial transactions. This involves both the buyer and the seller having the CCP as a counterparty rather than being exposed to each other. When a bank or other player has many bilateral transactions with many counterparties, it can be difficult to keep track of the risk associated with all counterparties. If instead the CCP acts as intermediary, this problem is reduced as there is only one counterparty. Another advantage with CCPs is that so-called "netting" and economies of scale enable more effective use of the collateral pledged in transactions.

A CCP is specialised in managing counterparty risks and must therefore follow strict regulations. This is one of the reasons why it is considered less risky to have a CCP as a counterparty rather than another player. The Riksbank is

therefore positive to increased central counterparty clearing as it poses less risk than bilateral clearing. No arrangement is totally risk-free, however, which is why it is important to monitor the risks that may arise in central clearing.

Banks use CCPs partly due to legal requirements,¹¹² but also it gives them the opportunity to reduce their capital requirements¹¹³ and their overall costs for risk management. Banks and CCPs are thus closely interlinked and dependent on one another.

All banks participating in a CCP must contribute to a common *default fund*¹¹⁴ as well as pledging collateral in order to enter any contracts. If a participant in a CCP defaults and the participant's own pledged collateral does not cover the debts, the common default fund will be used. This means that all participants in a CCP can be affected by losses incurred by a single participant. Furthermore, a CCP can make use of so-called assessment rights if its total resources are exhausted. This means that the banks must contribute more funds in relation to their original contribution to the default fund, usually between 100 and 200 per cent of the contribution to the default fund.

The total contributions of the major Swedish banks to default funds at the most important CCPs amount to about SEK 5.5 billion. Putting the contributions of the major banks to the default funds of CCPs in relation to, for example, their CET1 capital or their liquidity reserve provides an indication of how exposed the major banks are to problems in a CCP.¹¹⁵ The major Swedish banks' total contributions to CCP default funds correspond to less than two per cent of their combined CET1 capital. This figure is even less if a comparison is made with their liquidity reserves. Liquidity is important as the banks must have the capacity to replenish the default fund if it has been used in a crisis situation.

The fact that the banks' contributions to the default funds are small in relation to their capital and liquidity reserves does not, however, provide a complete picture of the banks' exposure and risk. As central clearing has become more common, the banks' counterparty risk has decreased in relation to individual players but at the same time been concentrated to a small number of large CCPs. This is also illustrated in the above-mentioned report that analyses interconnectedness in central counterparty clearing.¹¹⁶

¹¹⁰ The Riksbank's own RIX transactions are excluded from the calculation.

¹¹¹ See Chapter 2.

¹¹² ESMA provides a register of all derivatives covered by the clearing requirement: https://www.esma.europa.eu/sites/default/files/library/public_register_for_the_clearing_obligation_under_emir.pdf

¹¹³ According to the regulations that banks must follow, increased use of central counterparties implies less counterparty risk and hence lower capital requirements.

¹¹⁴ A *default fund* consists of compulsory contributions from the participants in the CCP. The contributions are proportionate to the participants' exposure.

¹¹⁵ A larger default fund contribution can, all other factors being equal, also indicate more conservative risk management and reduce the risk associated with counterparty clearing.

¹¹⁶ Analysis of Central Clearing Interdependencies, July 2017. BIS, CPMI, FSB and IOSCO.

The percentage of transactions via CCPs has risen sharply in recent years. For example, 75 per cent¹¹⁷ of global interest rate transactions were cleared via CCPs in 2016 compared with 16 per cent in 2007.¹¹⁸ As central counterparty clearing increases and a small number of CCPs take on an ever more important role in the financial system, it can be assumed that the systemic risks associated with a CCP failure would also increase.¹¹⁹ As mentioned above, the increased use of central counterparties has, most likely, still contributed to a reduction in systemic risks since the financial crises.

CCPs are dependent on banks

CCPs are in turn dependent on banks in different ways. A bank can be a:

- CCP participant.
- Credit supplier to a CCP. The credit is primarily used to guarantee liquidity in a stressed situation.
- Representative of players who do not have direct access to a CCP or a settlement bank for other CCP participants.
- Provider of collateral used by a participant to, for example, contribute to the default fund.
- Investment counterparty. As CCPs must invest both their own funds and the cash funds they receive as collateral from participants, banks can also act as investment counterparties for these purposes.

Even if Nasdaq Clearing has reduced its dependence on individual players to a certain extent, it is still an example of a CCP that is heavily dependent on a small number of banks. This is due partly to a number of banks having several roles in relation to Nasdaq Clearing and partly to some of these banks being particularly important within certain roles. This effect is amplified by the fact that the banks are interconnected to a high degree and hence dependent on each other to be able to perform tasks they have undertaken in relation to the CCP. The interconnectedness of the banks means that shocks can quickly spread from one bank to other banks and in turn lead to problems for a CCP. The interconnectedness between banks and CCPs therefore constitutes a financial stability risk.

More knowledge about interconnectedness is needed

The financial system is a complex interplay between different types of players that can be more or less closely interconnected. This makes the system vulnerable and creates risks to financial stability. It is therefore of major

significance that all central players in the financial system have good resilience and function as safely and efficiently as possible. An example of existing interconnectedness is banks and central counterparties being dependent on one another in order to conduct their operations.

More public data and analyses are required to be able to assess various links and interdependencies and thereby create more comprehensive understanding of the risks and vulnerabilities that are most relevant to the system. The Riksbank continues to work on these issues and participates actively in international working groups and in forums for the analysis of interconnectedness in the financial system.¹²⁰

¹¹⁷ BIS semi-annual OTC derivatives statistics, May 2017. BIS.

¹¹⁸ Derivative Market Analysis: Interest Rate Derivatives, ISDDA Research Note, January 2016. International Swaps and Derivatives Association.

¹¹⁹ Analysis of Central Clearing Interdependencies, July 2017. BIS, CPMI, FSB and IOSCO.

¹²⁰ Billborn, J. (2018), The Riksbank's oversight of the financial infrastructure, Economic Commentaries No. 7. Sveriges Riksbank.

Glossary

Basel III: International regulatory framework for banks' capital adequacy and liquidity. Basel III will be progressively phased in by 2019.

CET1 capital ratio: Core Tier 1 capital in relation to risk-weighted assets.

Common Equity Tier 1: 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).

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

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

Credit terms: The terms and conditions laid down in a loan agreement covering, for example, the interest rate and the repayment schedule. Credit terms can also include the maximum loan-to-value ratio allowed for a mortgage.

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

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

Debt service ratio: The ratio of households' post-tax mortgage payments to disposable income.

Direct yield: A measure of the yield from an investment. For investment in a property, this is defined as net operating income in relation to the value of the property.

Disposable income: The total of a person's or a household's incomes less taxes and charges.

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

IFSR 9: International Financial Reporting Standard. An international financial reporting standard developed by the International Accounting Standards Board (IASB) and applied by about 120 countries in the world including the entire European Union.

Interbank rate: The interest rate on unsecured loans that the banks offer other banks. Stibor (Stockholm Interbank Offered Rate) is usually used to measure the Swedish interbank rate. Stibor is used as a reference for rate setting or pricing of derivative contracts.

Interest ratio: Household post-tax interest expenditure in relation to disposable income.

Leverage ratio: A measure that specifies the bank's capital in relation to its total assets and off-balance-sheet commitments. The measure is used as a complement to the risk-based capital adequacy requirements.

Liquidity: Measure of the ability of a company or organisation to meet its payment obligations in the short term.

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

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

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

Market liquidity: Market liquidity refers to the ability to rapidly buy or sell significant volumes of a financial instrument at a low transaction cost and with limited market price impact.

Mortgage cap: A measure which limits how large a borrower's mortgage is permitted to be in relation to the value of the home.

Net interest income: Interest income from lending less interest expenditure for funding and deposits.

Net operating income: A property's rental income minus operating and maintenance costs.

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

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

Risk-weighted exposures or risk-weighted assets: Assets recorded in the balance sheet and off-balance sheet obligations valued by credit, market and operational risk in accordance with the capital adequacy regulations, see Basel III.

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

Systemically important: An actor, market or part of the financial infrastructure is regarded as being systemically-important if problems that arise there could lead to disruptions in the financial system that would result in potentially large costs to society.

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



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