

Financial Stability Report

2017:2



The Riksbank's Financial Stability Report

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

The Executive Board of the Riksbank discussed the Report on two occasions – on 8 November and 20 November 2017. The report takes into account developments up to and including 14 November 2017. 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 disruptions 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 participants' 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 if there is a general fall in confidence in 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. Banks and other market participants 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 lead to a crisis. 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 participants, or at legislators and other authorities.

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SUMMARY

Strong economic development and stable financial markets

The economic recovery abroad and in Sweden has continued since the previous stability report in May and on the financial markets developments have generally been relatively stable. In the coming years, economic activity is expected to be strong in Sweden, underpinned in part by expansionary monetary and fiscal policy. The risks linked to international economic developments remain, but are less than they were in the spring.

Housing prices have been increasing over a long period of time

For a long time, Swedish housing prices have risen sharply and are high in a historical perspective. Over the last ten years alone, house prices have doubled and tenant-owned apartment prices have tripled. Structural factors, such as an imbalance between the supply and demand of housing, along with rising disposable incomes and continuously falling interest rates have contributed to the rapid upturn in housing prices. Ever higher housing prices have also contributed to a rapid rise in household borrowing.

The increase in housing prices has halted

Since the middle of the summer, housing price increases have slowed and housing prices have fallen slightly during the autumn. In September and October, prices fell in comparison with the previous month. The increased supply of housing in recent years may have contributed to the slowdown. In the Riksbank's forecast, housing prices are set to increase more slowly in the next few years, due in part to a greater supply of housing and household mortgage rates starting to rise.

An increased supply of housing and a slower rate of price increase are expected to contribute to a more stable development on the housing market and a slower rate of increase in household debt. At the same time, there is a risk that the increased construction will not match demand. A situation could also arise in which housing construction continues to increase heavily at the same time as demand weakens. If large imbalances arise, this could result in rapid and major adjustments to the highly elevated housing prices, posing risks to financial and macroeconomic stability.

Household indebtedness continues to increase

Over the last six months, Swedish household debt has continued to rise faster than household incomes. The assessment is that the debt-to-income ratio will also

continue to rise in the period ahead. It is not just household indebtedness related to housing that has risen. Households' consumption loans have also increased more and more rapidly since mid-2016. The share of consumption loans only constitutes a small part of total household debt, however. Above all, it is smaller banks with higher-risk lending and a larger proportion of non-performing loans that are driving the increase in these loans. Since June 2016, about 75 per cent of the increase in consumption loans has come from banks that specialise in them.

Households are sensitive to shocks

The rise in household debt, combined with the fact that most mortgage borrowers have variable-rate loans, means that households can rapidly be affected by developments such as rising interest rates and price falls on the housing market. Interest rates and interest-to-income ratios (households' interest expenses in relation to their disposable income) are indeed expected to remain low in the years ahead, but if interest rates rise to more normal levels, this may have a major impact on households' interest expenses, particularly for highly-indebted households.

Historical experiences have shown that high indebtedness increases the likelihood of recessions and financial crises, as well as their length and depth. Currently, the Riksbank's assessment is that the high and rising household indebtedness poses the greatest risk to the Swedish economy. It is therefore important to continue with measures to increase resilience in the household sector and reduce the risks. One reason why indebtedness is rising is the poor functioning of the housing market. Even though the supply of housing is expected to continue to increase, and in the short term may lead to price pressure on housing, housing policy measures are required to achieve a better functioning housing market that can mitigate the risks associated with the high level of household indebtedness in the longer term.

Tax reforms are also needed that contribute to a balanced increase in housing prices and that reduce the willingness and capacity of households to take on debt.

Sweden's financial supervisory authority, Finansinspektionen (FI), has recently proposed a stricter amortisation requirement targeting households with high debts in relation to income. The Riksbank supports the proposal and considers it important that the Government takes a decision on this matter, so that the stricter amortisation requirement can be put in place. FI's mandate in the area of macroprudential policy should also be

clarified so that the authority can be prepared to undertake further macroprudential policy measures if necessary. Whether such a need will arise depends on how effective the measures so far implemented and proposed turn out to have been. It is also desirable that authorities and lenders have access to better anonymous data on the household level to be able to deepen analyses of risks among households and in the financial system.

The Swedish banking system is exposed to the property sector

There are also significant vulnerabilities and risks in the Swedish banking system, among them those linked to banks' substantial exposure to the real estate market. Loans to Swedish households and non-financial companies with housing and other types of property as collateral have increased and constitutes approximately 80 per cent of the major banks' total lending, 75 per cent of which is loans to households for housing purposes. Banks fund these loans to a high degree on the capital market, and especially with covered bonds, the collateral for which is made up of mortgages. As mortgages have increased in recent years, so have the volumes of covered bonds, a part of which are in foreign currency. This makes the banks sensitive to a fall in housing prices, as this could affect confidence in them, making it more difficult and expensive to find funding.

The major banks are also closely interconnected and have significant exposures towards each other, in part because they own each other's securities. This applies not least to covered bonds.

Large banking system either with or without Nordea

There are also vulnerabilities linked to the size and concentration of the Swedish banking system. The Swedish banking system's assets currently amount to the equivalent of 400 per cent of GDP. If Nordea moves its headquarters from Sweden to Finland in October next year as planned, this figure will fall to just below 300 per cent of GDP. However, Nordea's operations in Sweden are not expected to change in terms of size and close interconnectedness with other banks.

One change that would occur if Nordea were to move to Finland would be a reduction of Sweden's formal responsibility for Nordea. As a member of the banking union, Finland would instead have greater responsibility. Fully developed, the banking union offers a considerable measure of risk-sharing among its member countries, which reduces the potential costs to an individual country should its banking system encounter problems. The banking union's institutions are still rather new, however, and not yet fully complete. As a result, much of the responsibility so far remains with the individual countries in the union. From a Swedish stability perspective, it is important that Nordea's

move does not lead to increased financial stability risks, as a result, for example, of reduced capital and liquidity requirements for the bank, and that Finland can shoulder the responsibility entailed by this move to a banking union that is not fully complete yet.

Important for the banks to have self-insurance

Sweden has a large, cross-border banking sector with significant commitments in foreign currency. The banks' limited resilience to liquidity risks and other risks is contributing to making the financial system sensitive to shocks. Weak resilience among Swedish banks to liquidity stress in Swedish kronor or foreign currency can hence pose significant risks to financial stability. Some major banks have periodically very low liquidity coverage ratios (LCRs) especially in Swedish krona but also in some foreign currencies. 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' LCRs in Swedish krona and in all significant currencies, which are currencies that constitute more than five per cent of a bank's total debts.

It is also important for the major Swedish banks to continue to reduce their structural liquidity risks, for example by obtaining funding with longer maturities. Better measures are also needed in order to monitor banks' liquidity risks both in the short and the long term. It is also important that the banks are transparent about the liquidity risks they take.

A leverage ratio requirement of 5 per cent is appropriate

In light of the size of the Swedish banking sector, the vulnerabilities in the banking system and the risks to which the banks are exposed, it is important that the major banks have sufficient capital. The Riksbank assessment is that a leverage ratio requirement of 5 per cent for the major Swedish banks should be introduced, as a complement to the risk-weighted capital requirements. Calculations also indicate that a higher requirement than 5 per cent may be socioeconomically effective. It may therefore prove appropriate to further increase the requirement in the period ahead.

In addition, there are plans on the international level for supplementary regulations that can impose additional capital requirements on some banks in the future. The Riksbank welcomes new regulations that help to strengthen global financial stability and are important for Sweden, which has a large banking sector and, at the same time, a small and open economy. Bearing in mind the risks in individual countries, the Riksbank considers it important that national supervisory authorities have the possibility to

place additional requirements over and above international regulations.

CHAPTER 1 – The economic and financial situation

The economic recovery abroad is continuing and includes an increasing number of countries. In Sweden, economic activity is continuing to be strong and is expected to remain so in the years ahead, supported by an expansionary monetary and fiscal policy, among other things. The strong economic development provides good conditions for financial stability. Continued high credit growth among households and companies and low credit losses are helping the major Swedish banks to show healthy profits. Developments on the financial markets have been relatively stable since May. Housing prices have fallen during the autumn and there is an unease over the development of the housing market. This has contributed to falling equity prices for some companies within the property sector.

Continued strong economic activity

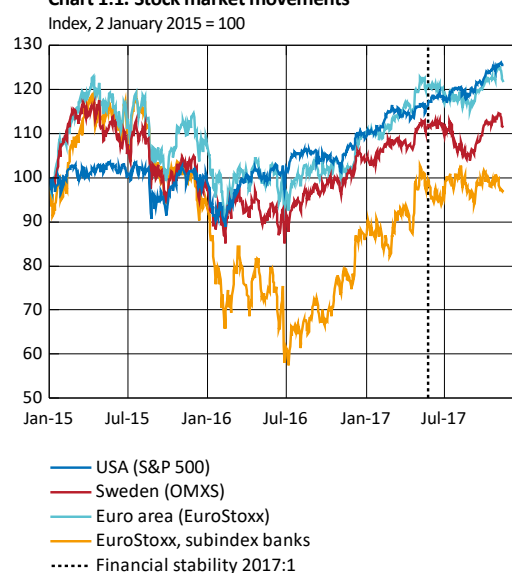
Economic activity abroad has continued to strengthen since May and the recovery covers an increasing number of countries. Global trade is growing and several indicators suggest sentiment is good among households and companies. Since the end of May, Swedish economic activity, underpinned by expansionary monetary and fiscal policy, has remained strong.¹ Economic activity is also expected to be strong in the coming period and to create good conditions for stability in the financial system.

Overall, developments on the financial markets have been relatively stable. However, internationally, and particularly in the euro area, stock markets fell at the end of the summer due, in part, to the increased geopolitical tension between North Korea and the United States (see Chart 1:1). Since September, however, stock markets in the Europe have recovered and are now on approximately the same level as in May. The sub-index for European banks has also recovered, but concerns over the state of the European banking sector remain. In the United States, the stock market has risen since the end of May and is now at historically high levels. Equity prices of companies in the property sector have fallen, however, as a result of concerns over developments on the housing market.

Expansionary monetary policy

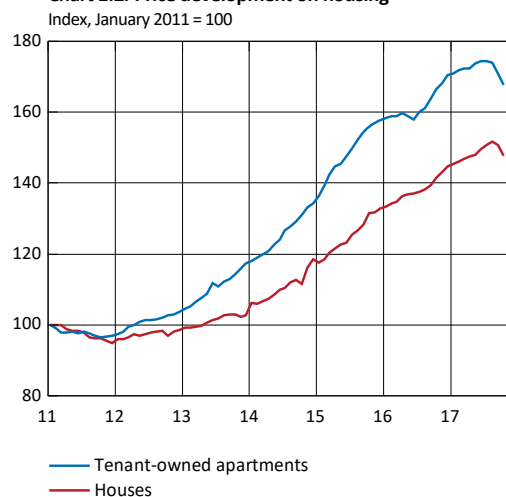
In several countries, monetary policy has been markedly expansionary for a long time. However, the US central bank, the Federal Reserve, decided to increase the interval for the policy rate to 1.0–1.25 per cent at its monetary policy meeting in June. This was the second rate increase this year. At its meeting in September, the Federal Reserve announced that they intended to start tapering its balance sheet, by reducing the rate of reinvestment in its bond holdings as from October. Furthermore, market expectations of another increase in the US policy rate this year have risen.

Chart 1:1. Stock market movements



Sources: Macrobond and Thomson Reuters

Chart 1:2. Price development on housing



Note. Housing prices are seasonally-adjusted.

Sources: Valueguard and the Riksbank

¹ Monetary Policy Report, October 2017. Sveriges Riksbank.

The European Central Bank (ECB) announced, at its monetary policy meeting in October, that net asset purchases will continue into 2018, but that the volumes will be smaller. At the same time, the Riksbank decided, at its meeting in October, to continue with purchases of government securities over the rest of the year and to reinvest maturities and coupon payments on its government bond portfolio until further notice. It was also communicated that a decision on the possible extension of purchases will be taken in December. Both the ECB and the Riksbank held their policy rates unchanged. The market expects an initial rate rise from the Riksbank sometime next year and from the ECB in early 2019. The Riksbank's assessment is that the repo rate will be raised by around one percentage point over the coming years. Monetary policy is thereby expected to be expansionary for a longer period and to provide continued support to economic development.

Slowdown in housing price increases

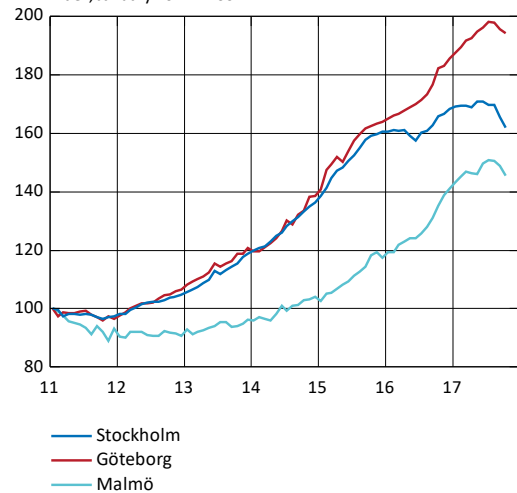
After having increased heavily for many years, housing prices are now rising at a slower rate and the annual rate of growth has slowed down since the middle of the summer. In recent months, housing prices have fallen at a monthly rate. However, expressed as an annual rate, prices have in most places continued to rise. The price development of tenant-owned apartments in particular has slowed (see Chart 1:2 and Chart 1:3). However, there are regional differences. Prices in Stockholm have slowed down over the last year, while, above all, there has been a slowdown in Göteborg and Malmö in recent months (see Chart 1:3). However, it is still in Stockholm that prices for tenant-owned apartments are highest per square metre.

A possible cause of recent lower growth rates in housing prices is a greater supply of completed homes and housing starts. In recent years, construction of housing has increased substantially and, in 2016, about 42,000 homes were completed, at the same time as construction of about 60,000 homes was started (see Chart 1:4).

Weaker price development has probably contributed to expectations of subdued profitability primarily for property developers.² This has led to a fall in the share value for this type of company in recent months (see Chapter 2).

Surveys show that the general public expects housing prices to rise at a slower rate than previously over the next year. Real estate agents' expectations of price increases have weakened. The Riksbank's forecast suggests that housing prices will increase more slowly in the next few years, due in part to a greater supply of housing and household mortgage rates being expected to start to rise.

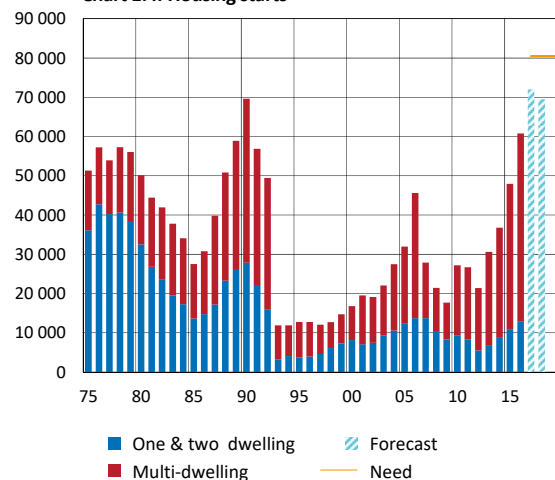
Chart 1:3. Price development on tenant-owned apartments
Index, January 2011 = 100



Note. Housing prices are seasonally-adjusted. Note. Housing prices are seasonally adjusted. The chart shows indexed series from 2011, and does not capture that the price level in Stockholm is higher than in the other cities.

Sources: Valueguard and the Riksbank

Chart 1:4. Housing starts



Note. Need refers to the Swedish National Board of Housing, Building and Planning's construction need forecast. The striped bars are forecasts from the Swedish National Board of Housing, Building and Planning's indicator of housing construction from November. The figures represent new construction excluding conversions and have been adjusted for the time delay in reporting.

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

² The term "real estate developer" refers to companies that invest in land or property (both new and old properties, for example industrial facilities) and then hire construction companies to build or convert these into homes with the intention of selling them.

Continued high credit growth among households and companies

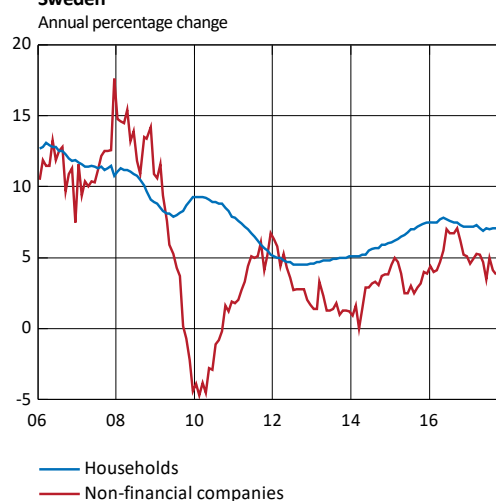
In 2017, the rate of growth in lending to households has slowed slightly, but is still high (see Chart 1:5). Lending to households largely consists of loans with tenant-owned apartments and single-family houses as collateral. In September, the annual growth rate was 7.1 per cent. The growth rate for consumption loans is rising at a rapid pace and the annual growth was 8.3 per cent in September. Household debt in relation to disposable income continues to rise and now exceeds 180 per cent.

Also, the growth rate of bank lending to companies has slowed in 2017. Lending to companies rose by 3.8 per cent in annualised terms in September. At the same time, companies are obtaining funding to a greater extent by issuing bonds and certificates.³ So far this year, the average growth rate for this form of funding has been 16.4 per cent in annualised terms, compared to 8.5 per cent on average during 2016. Lending is expected to continue to grow in the coming years, due in part to good economic development in Sweden and continued low interest rates.

Major banks showing good profitability

The major Swedish banks report continued high return on equity compared with other European banks (see Chart 1:6). The major Swedish banks' margins on mortgages are currently historically high.⁴ Good economic conditions have also led to larger lending volumes and higher revenue from, for example, advisory and transaction fees, which has had a positive impact on banks' profits. At the same time, their costs and credit losses are on a low level. Continued good economic development suggests they will continue to show good profits in the period ahead.

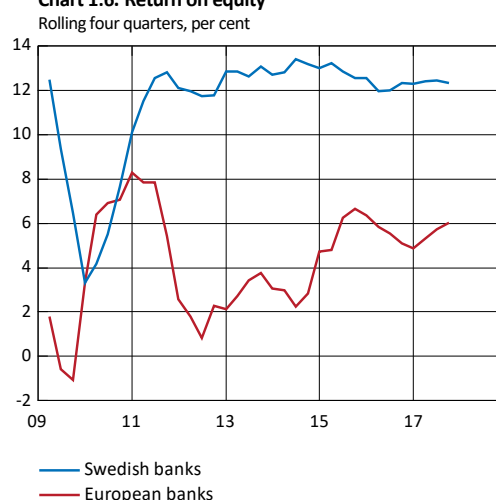
Chart 1:5. Loans to households and non-financial companies in Sweden



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

Source: Statistics Sweden

Chart 1:6. Return on equity



Note. Unweighted average.

Sources: SNL Financial and the Riksbank

³ This form of funding constitutes approximately 30 per cent of companies' total loan financing.

⁴ Bankernas marginal på bolån, tredje kvartalet 2017. [Bank's margins on mortgage loans, third quarter, 2017]. Finansinspektionen.

CHAPTER 2 – Vulnerabilities and risks in the financial system

The high level of household indebtedness and the banks’ exposures to the housing market make the Swedish financial system vulnerable and sensitive to shocks. The structure of the banking system and the banks’ limited capital and resilience to liquidity risks also contribute to this vulnerability. The risks are linked, among other things, to the current low interest rates as they can lead to excessive risk taking, to assets being overvalued and to various parties increasing their indebtedness to an unsustainable level. The risks linked to international developments remain but are less than they were in the spring.

Vulnerabilities and risks linked to household indebtedness

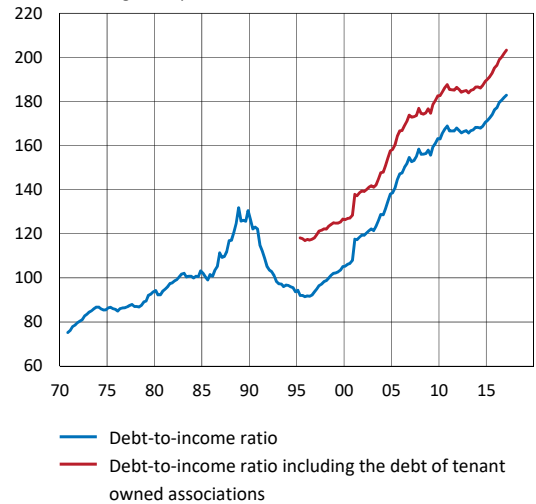
The Riksbank’s assessment is that high and rising household indebtedness poses the greatest risk to the Swedish economy. There is broad consensus in Sweden regarding this risk, which has also been highlighted by international bodies such as the International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD), the European Commission and the European Systemic Risk Board (ESRB).⁵

Households are highly indebted

Swedish household indebtedness has been increasing over a long period of time. The increase can be explained by several different factors (see the article “Household indebtedness and interest rate sensitivity”). The aggregate debt-to-income ratio (household debt in relation to their disposable income) for the entire household sector is currently over 180 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 47 percentage points compared to 2010.⁶ The data also shows that 31 per cent of the households (640 000 households) have a debt-to-income ratio in excess of 400 per cent and that 13 per cent (260 000 households) have a debt-to-income ratio of more than 600 per cent (see Chart 2:2). Since 2010, debt-to-income ratios have increased in all income groups.

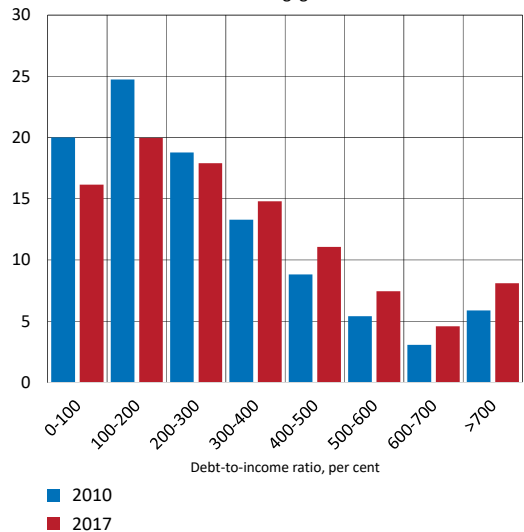
According to FI’s mortgage survey, the debt-to-income ratio among new mortgage borrowers has decreased somewhat, from 406 per cent in 2015 to 402 per cent in 2016.⁷ This decrease suggests, according to FI, that the amortisation requirement, which came into force in June 2016, has dampened debt-to-income ratios slightly for new

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



Sources: Statistics Sweden and the Riksbank

Chart 2:2. Distribution of households’ debt-to-income ratio
Per cent of households with mortgages



Source: The Riksbank

⁵ Country Report Sweden, February 2017. European Commission and *Financial System Stability Assessment Sweden*, October 2016. International Monetary Fund (IMF).

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

⁷ *The Swedish Mortgage Market 2017*. Finansinspektionen.

mortgage borrowers.⁸ Nevertheless, households are still highly indebted in total.

The annual growth rate for lending to households has flattened slightly since mid-2016 but is still high (see Chart 2:3). Since June 2016, the annual growth rate for consumption loans has been rising increasingly rapidly. Consumption loans currently make up about 5 per cent of total household debt, but about 13 per cent of interest expenses as interest rates are generally higher for consumption loans than for mortgages.⁹ There is no clear pattern regarding what type of household takes consumption loans. Consumption loans are taken by households in all income and age groups spread across the whole country. It is primarily smaller banks that are responsible for the increase in these loans. Since June 2016, about 75 per cent of the increase has come from banks that specialise in consumption loans. Compared with the major banks, these banks typically have riskier lending and a larger proportion of non-performing loans, which makes the monitoring of developments on this market a matter of pressing importance. There may be several factors that have contributed to the rapid increase in consumption loans. For example, technological changes have facilitated online payments while it has also become much quicker and easier to apply for consumption loans via online services.

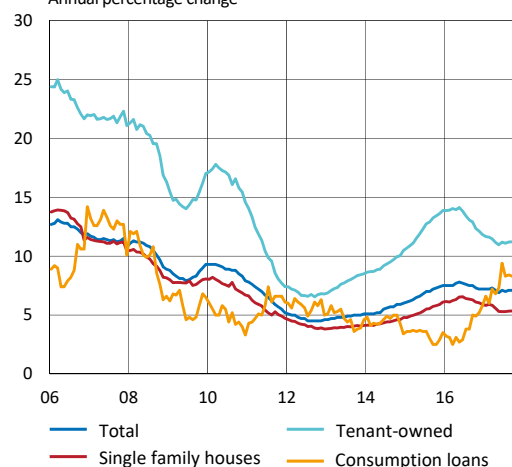
In addition to their bank loans, many households also have indirect debts in the form of loans taken out by their housing associations, whose interest expenses and amortisations are partly reflected in the association's monthly fees. The housing associations' debts have risen by 41 per cent since 2010 and currently amount to SEK 448 billion. The aggregate debt-to-income ratio for households including loans via housing associations amounts to over 200 per cent (see Chart 2:1).

In the period ahead, household debt is expected to grow slightly slower than currently, due to a more subdued development in housing prices. Debt and housing prices are nevertheless expected to rise more quickly than households' disposable income (see Chart 2:4). This means that the aggregate debt-to-income ratio will continue to rise and amount to almost 200 per cent in 2020.¹⁰

Households are increasingly sensitive to shocks in the economy

Despite households having historically high debts, the low interest rates have meant that their housing expenditure is

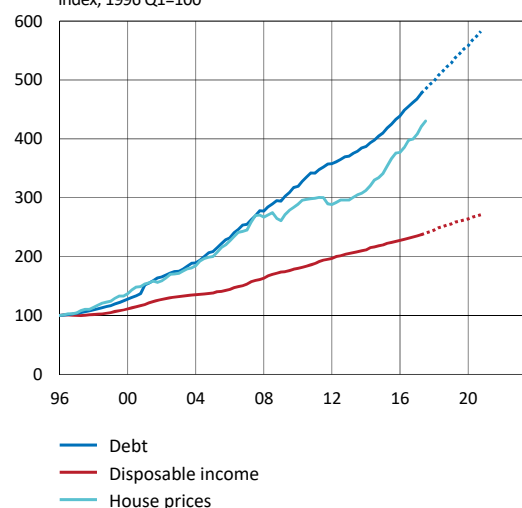
Chart 2:3. Household loans, broken down by collateral
Annual percentage change



Note. Annual growth rate for total household lending and consumer loans have been adjusted for reclassification and bought and sold loans.

Sources: Statistics Sweden and the Riksbank

Chart 2:4. Disposable income, housing prices and debt
Index, 1996 Q1=100



Note. Disposable income refers to quarterly data, four-quarter moving average. House prices refer property price index. The dashed lines represent the Riksbank's forecast.

Sources: Statistics Sweden and the Riksbank

⁸ Amortisation requirement reduced household debt, *FI Analysis* 10 April. Finansinspektionen.

⁹ The average interest rate is 4.8 per cent for consumption loans and 1.7 per cent for mortgages (Statistics Sweden). A consumption loan can, for example, be taken as an annuity loan, which means that the same amount is paid each month. At the beginning of the repayment period, interest expenses make up a larger share and the amortisation amount a smaller share of the loan payment. As the loan is amortised, the interest expense decreases and the amortisation amount increases.

¹⁰ *Monetary Policy Report*, October 2017, Sveriges Riksbank.

currently low. The current conditions for households to repay their loans are therefore deemed to be good.

At the same time, the increase in household debt has made households more sensitive to changes that affect their finances, such as rising interest rates, higher unemployment rates and falling housing prices. The fact that 67 per cent of the mortgage stock is borrowed at a variable interest rate and 72 per cent of new mortgages are taken at a variable rate exacerbates this sensitivity. This means that households could be rapidly affected by rising interest rates. Interest rates and interest-to-income ratios (households' interest expenses in relation to their disposable income) are expected to remain low in the years ahead (see Chart 2:5).¹¹ But if interest rates rise to more normal levels or if interest rates rise due to stress on the financial markets, this may have a major impact on households' interest expenses, especially for highly-indebted households (see the article "Household indebtedness and interest rate sensitivity").

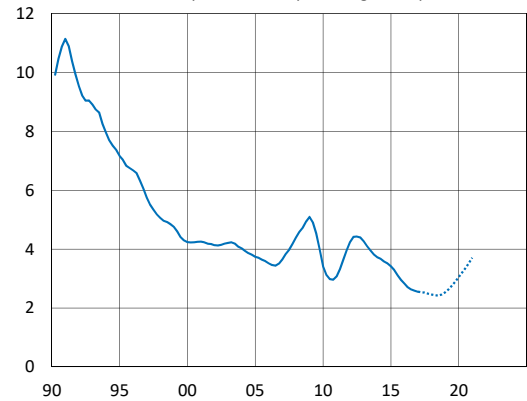
Housing associations also have a large percentage of loans at variable interest rates, which means that households who own tenant-owned housing can be even more affected by rising interest rates. If the association has to increase its fees to pay its bank loans, the household will not only have to pay higher monthly fees but also have higher interest expenses for its own bank loan.

High indebtedness poses risks to the Swedish economy

One factor that might potentially reduce the risks associated with high household indebtedness is the fact that saving is currently on an historically high level. There is no information on how assets and savings are distributed among households, however, and it is therefore not clear how much savings the most indebted households have. There are indications, however, that the most highly indebted households have relatively small liquid assets in relation to their income.¹² In a stressed scenario, this means that the most highly indebted households have relatively small buffers to cope with unexpected economic shocks.

High debt levels may be particularly problematic if economic growth should become significantly less positive than expected. Highly-indebted households may then significantly reduce their consumption, particularly if housing prices also start to fall. If consumption declines, this may in turn reduce the profitability of Swedish companies and lead to higher unemployment, which may ultimately lead to increased loan losses for the banks. Confidence in the banks could weaken in such a situation, which could also affect both

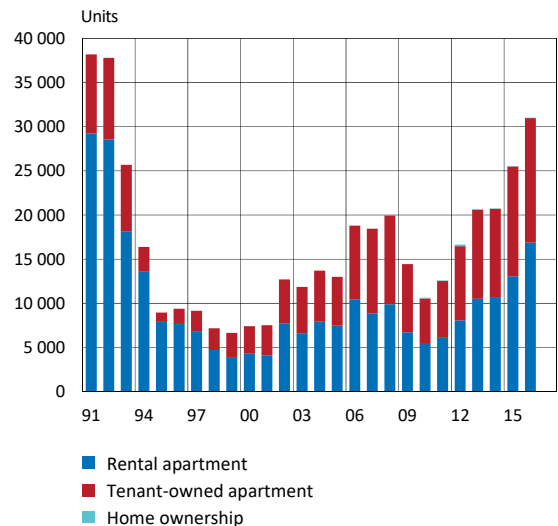
Chart 2:5. The Swedish households' interest-to-income ratio
Per cent, interest expenditure as a percentage of disposable income



Note. Interest expenses are adjusted for tax relief. The dashed line represents the Riksbank's forecast.

Sources: Statistics Sweden and the Riksbank

Chart 2:6. Completed apartments, broken down by form of tenure



Source: Statistics Sweden

¹¹ Armelius, H., Bonomolo, P., Lindskog, M., Rådahl, J., Strid, I., and Walentin, K. (2014) "Lower neutral interest rate in Sweden? *Economic Commentary* No. 8. Sveriges Riksbank. See also "The long-term repo rate." Article in *Monetary Policy Report*, February 2017. Sveriges Riksbank.

¹² 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.

access to and the cost of the banks' funding, which is largely obtained in foreign currency.¹³ There is therefore a risk of economic development entering a downward spiral with serious consequences for both financial and macroeconomic stability.¹⁴

Risks on the housing market

Housing prices are high

The high and rising indebtedness has gone hand in hand with sharply rising housing prices that are now historically high.^{15,16} House prices are twice as high as they were ten years ago and tenant-owned apartment prices are three times as high. The fact that housing prices have been rising rapidly for a long period of time is explained by structural factors, such as an imbalance between supply and demand for housing, rising real wages and lower taxes, which has benefited households' disposable incomes.

Housing prices are now increasing at a slower pace and the annual growth rate has slowed. Since September, the monthly change in the prices has been negative (see Chapter 1). A possible cause of lower growth rates in housing prices can be the increased supply of completed homes and housing starts.

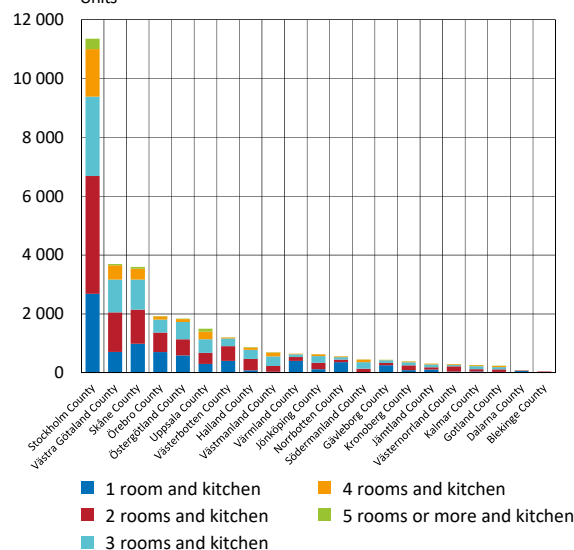
Construction levels are still high

Since 2011, the supply of housing has gradually increased, and housing construction has risen to levels reminiscent of the time before the 1990s crisis (see Chart 1:4).

In 2016, approximately 42,000 homes were completed, of which about 31,000 were apartments. Of these, around half were tenant-owned apartments and half rental apartments (see Chart 2:6). Almost 90 per cent of the completed apartments were apartments of 1–3 rooms (see Chart 2:7). In 2016, construction started on about 60,000 new homes and in many counties, the level of construction is much higher than the historical average (see Chart 2:8). Construction is taking place primarily in metropolitan regions, especially in Stockholm County, where demand for housing has been the highest.

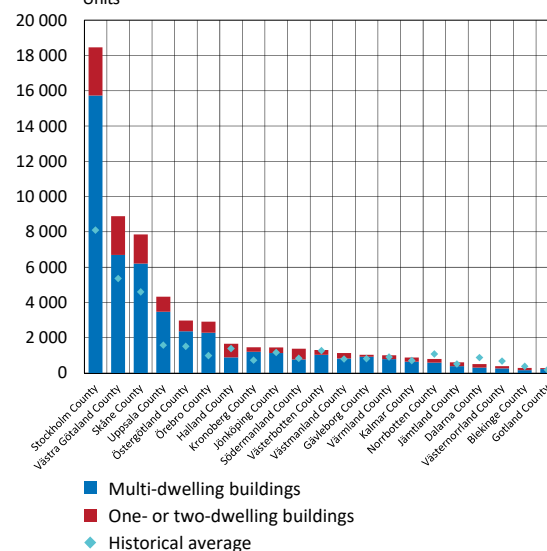
An increased supply of housing and a slower rate of price increase are expected, in the long run, to contribute to a more stable development on the housing market and a slower rate of increase in household debt, which is desirable.

Chart 2:7. Completed apartments per county in 2016
Units



Sources: Statistics Sweden and the Riksbank

Chart 2:8. Housing starts per county in 2016
Units



Note. The figures have not been adjusted for the time delay in reporting. The historical average is calculated for 1975–2016 and refers to both apartment blocks and single-family houses.

Sources: Statistics Sweden and the Riksbank

¹³ Of the banks' total market funding, approximately 60 percent are in foreign currency.

¹⁴ Emanuelsson, R., Melander, O. and Molin, J. (2015), Financial risks in the household sector, *Economic Commentary* no. 6. Sveriges Riksbank.

¹⁵ Giordani, P., Grodecka, A., Kwan, S., Morales, P., Ölcer, D. and Spector, E. (2015) Asset valuation and financial stability, *Economic Commentary*, no. 15. Sveriges Riksbank.

¹⁶ In global terms, too, low interest rates have contributed to rising house prices and higher indebtedness, for instance in Australia, Canada, New Zealand and Norway.

Recent developments may cause problems for individual companies and households

The stock market value of several construction and property companies has fallen recently. This is particularly true for companies that focus on the development of expensive homes in metropolitan regions. This development probably reflects a concern regarding future price developments in the light of the increased construction and direct signals of reduced profitability from property developers.

The number of property developers has increased significantly in recent years, especially in Stockholm.¹⁷ As a rule, the new companies are relatively small. Several of these companies have been very profitable, partly as a result of the sharply rising housing prices. The major banks' lending to this type of operation is relatively small. Total lending by the four major banks to construction and property companies in Sweden is about SEK 800 billion. Of these, about half is lending to finance housing properties, SEK 50 billion of which goes to developing tenant-owned apartment properties (in the form of construction loan agreements¹⁸) and mainly to larger, more established players. Smaller property developers, on the other hand, obtain more of their funding via equity capital or on the market.

There is a risk that the increased construction does not match demand, for example, that the constructed apartments are too exclusive, built in the wrong location or not of the appropriate size. The homes under construction do, however, seem to be in line with the existing needs, i.e. smaller apartments in metropolitan areas. But there is a risk that the price of the newly constructed homes being too high. This may make it difficult for certain companies to sell the 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. All in all, this could entail problems for some property developers in particular, with regard to both their profitability and their possibility to renew funding. In the event of housing prices falling, a situation where some property developers find it difficult to maintain their activities cannot be ruled out. Given that these companies are relatively small, this need not have any major effects on the Swedish economy at large. As the major Swedish banks have relatively minor exposure to these companies, neither would such a development be likely to pose any large, direct risks to the major banks. It is also important to note that the banks, in order to fund the construction of an apartment block, normally require about 60–70 per cent of the apartments to have been sold before

¹⁷ According to Statistics Sweden, the number of construction project developers increased from 111 companies in 2008 to 376 companies in 2016.

¹⁸ This figure refers to the four major banks' lending in the form of construction loan agreements to tenant-owned apartment properties under construction. A bank that has issued a construction loan agreement pays all the incoming invoices, which means that the borrowed amount grows during construction. When the property is complete, the building is valued and the loan is converted into a normal loan with collateral in the property.

The major banks' lending with property as collateral has increased

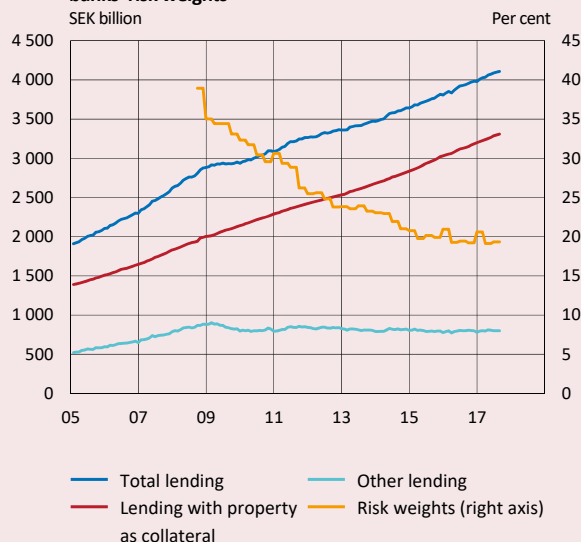
Since 2005, the major Swedish banks' total lending to Swedish companies and households has increased from around SEK 2,000 billion to just over SEK 4,000 billion. This increase can be explained almost entirely by lending to Swedish household and companies with collateral in property having increased, and now comprising around 80 per cent of the major banks' total lending, where about 75 per cent of this share goes to households for housing purposes. Other lending has remained relatively constant during this period and will be either other pledged collateral, such as vehicles and trade receivables, or without any form of collateral, that is in the form of unsecured loans. The major Swedish banks have thus become even more exposed to the property market. This increased concentration of the banks' lending with property as collateral poses risks to financial stability. If, for example, confidence in the housing market deteriorates, confidence in the collateral may deteriorate, thereby impairing the major banks' possibilities of funding their lending via the bond market. The fact that the major banks also own each others' covered bonds increases the risk still further.

Several factors can explain the major banks' increased lending with property as collateral. Lending to households is closely linked to the rapidly rising housing prices. When the value of property increases, the banks can normally lend more money to customers who own property than would otherwise have been the case, as the value of these properties to some extent governs how much the customers can borrow. The increased lending is also due to the number of households and finished housing having increased during this period of time.

But other factors have also affected this form of lending. For instance, the major banks have to some extent introduced internal models to calculate their risk weights. These largely govern the capital adequacy requirements for this type of lending. This has resulted in falling average risk weights for lending with property as collateral (see Chart 2:9). All in all, the four major banks' average risk weights are presently just below 20 per cent, compared with just over 30 per cent in 2011.

FI has introduced measures in gradual stages to deal with some of these risks. For instance, a mortgage cap for households and a risk-weight floor for Swedish mortgages have been introduced. Further, FI has introduced an amortisation requirement for the households with the highest indebtedness and initiated new methods for calculating the banks' internal models aimed at increasing the banks' risk weights for lending to companies. Despite these measures, the major banks' lending with property as collateral has continued to increase.

Chart 2:9. Loans with property as collateral and the major banks' risk weights



Note. Refers to the major banks' average risk weights (the risk-weight floor of 25 per cent, introduced by FI for Swedish mortgages, are excluded, as are other measures within Pillar 2).

Sources: Statistics Sweden and the banks' interim reports

construction starts. Overall, the banks' direct risks linked to this sector seem to be limited.

Falling housing prices can also pose problems for individual households who have committed to buying a newly-built tenant-owned apartment a long time in the future. The sale of newly-built apartments takes place with a so-called "advanced contract". This means that the buyer enters into an agreement relatively early in the construction process to pay a fixed price a long time in the future. An agreement that applies even if there is a sharp fall in prices on the housing market. A buyer who is also counting on a contribution from the sale of an existing home is thereby exposed to the risk of falling housing prices both via the new and the old home whilst the new one is under construction. This is mainly a risk for households that have recently signed a contract for an apartment. Households that signed for a new apartment further back in time, have since then probably seen the value of both their current and their future apartment rise. The buyer also has a funding risk as the loan commitment made by the bank, and upon which the agreement is based, is not binding for the bank.

Recent developments on the housing market can therefore pose risks to individual companies and households.

The housing market can pose risks to financial stability

A situation may also arise in which housing construction in general appears to have increased too much in relation to market demand. This may occur, for example, if the supply is based on overly optimistic income and price expectations, or if there is an unexpected and sharp fall in household demand. If a large imbalance arises, it may result in rapid and major adjustments to the highly elevated housing prices, which poses risks to financial and macroeconomic stability. Falling prices can, for example, pose major problems for highly indebted households, partly because there is a risk of lock-in effects if the value of the home falls below the debt. Households may then find it difficult to adjust their housing and hence their housing expenses to changed economic conditions. Such lock-in effects on the housing market can be a problem for the economy at large if they affect many households, as this may impair the functioning of both the housing market and the labour market. If housing prices fall, households may also reduce their consumption and increase their saving to restore their balance sheets. This could affect the profitability of Swedish companies and ultimately increase the banks' loan losses and have a negative impact on their possibilities to obtain financing (see below).

However, it is important to regard the developments of recent months in the housing market in the light of the high prices and structural challenges with an imbalance between demand and supply that have affected the market over a long period of time. Most construction and property companies have been doing well over a long period of time and some

problems in smaller companies need not entail contagion risks to other parts of the economy. The Riksbank's assessment is that housing prices will increase more slowly in the next few years, due in part to a greater supply of housing and household mortgage rates being expected to start to rise.

Vulnerabilities and risks in the Swedish banking system

As before, the Riksbank sees vulnerabilities and risks in the Swedish banking system. This applies in particular to its structure and large exposures to the housing market, as well as its limited capital and resilience to liquidity risks.

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 total assets of the Swedish banking system amount to about 400 per cent of Sweden's GDP, 320 per cent of which are held by the major banks.²³ The Swedish banking sector is strongly concentrated and the four major banks, Handelsbanken, Nordea, SEB and Swedbank, account for around 70 per cent of lending in Sweden and approximately the same share of deposits. The major banks have a large proportion of loans with housing and other types of property as collateral on their balance sheets (see the box "The major banks' lending with property as collateral has increased"). 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. This means that if a fall in housing prices affects confidence in the Swedish banks, they may be forced to renew their financing at a higher cost, or in the worst case experience problems trying to renew it, which would entail a threat to financial stability.

On top of this, the major banks are closely interconnected and have significant exposures towards each other, in part because they own each other's covered bonds. The structure of the Swedish banking system thus means that problems in one bank can quickly spread to other banks and markets, and damage confidence in the entire financial system.

Nordea changed its corporate structure at the end of 2016/start of 2017. According to the new structure, foreign subsidiaries have been converted into branches of Nordea's

Nordea plans to move its head office to Finland

Nordea is planning to move its head office from Sweden to Finland. The plan is for the move to be implemented in October 2018. If this happens, the Swedish banking system's assets will decline from around 400 per cent to just under 300 per cent of GDP, but this will still be significant in relation to the Swedish economy. For Finland, the corresponding figure will increase from around 200 per cent to just over 400 per cent of GDP.

In the event of a move, the main responsibility for Nordea's supervision, resolution and deposit guarantee will be transferred from Swedish authorities to Finland and the European Banking Union, with reduced influence for Swedish resolution and supervisory authorities. It can be observed that the European Banking Union has still to be finalised.¹⁹ The Single Supervisory Mechanism, SSM, through which the ECB is responsible for the supervision of the largest banks, and the Single Resolution Mechanism, SRM, are, however, already in place.²⁰ But, the single resolution fund will be built up over time and the responsibility for covering the costs of resolution will still lie with the individual country to a large degree. The participating countries have not yet agreed who shall stand as final guarantor for the fund. Finally, the single European deposit guarantee system has not been put into place. This means that, until further notice, Finland will be the ultimate guarantor for Nordea's deposit customers.

Even if the supervisory responsibility changes as a result of the move, the risks to the Swedish banking sector will not decrease as Nordea will continue to operate in Sweden. The close interconnectedness of the major banks would probably not change, either. Given that Nordea will continue to be a significant part of the Swedish banking system²¹, it is therefore important that capital and liquidity requirements are sufficiently high.²²

There is scope within the SSM for national discretion, which means that higher requirements can be set than those that generally apply within the SSM. The Finnish government has put forward a bill with this content. The Riksbank considers it important that this is done so that Nordea's capital requirement does not decline as a result of the move, given the bank's continued systemically important role in Sweden. A question that is related to this is how macroprudential measures will be applied at Nordea's branch in Sweden. It is important that the regulations continue to be the same for all banks that operate in Sweden.

All in all, Nordea's move to Finland could reduce Sweden's formal responsibility for Nordea. As a member of the Banking Union, Finland would therefore have a greater responsibility as regards, for example, protecting depositors in Nordea's Nordic branches. Fully developed, the banking union offers a considerable measure of risk-sharing among its member countries, which reduces the potential costs to an individual country should its banking system encounter problems. The banking union's institutions are still rather new, however, and not yet fully complete. As a result, much of the responsibility is still on the individual countries in the union. From a Swedish stability perspective, it is important that Nordea's move does not lead to increased financial stability risks, as a result, for example, of lower capital and liquidity requirements for the bank, and that Finland can shoulder the responsibility entailed by this move to a banking union that is not fully complete yet.

¹⁹ Ehrenpil, M. and Hector, M. (2017), Banking Union – what is it? *Economic Commentary* No. 5. Sveriges Riksbank.

²⁰ Single Supervisory Mechanism (SSM) and Single Resolution Mechanism (SRM) respectively.

²¹ Nordea has roughly 15–20 per cent of the Swedish banking market, depending on the product or customer segment referred to.

²² The Swedish Finansinspektionen has the right to try to influence the requirements made in the form of so-called joint decisions, as part of Nordea's supervisory college, but if no agreement is reached, the final decision lies with the ECB.

²³ The calculation is based on Sweden's GDP and Swedish banks' assets (including the major banks' assets abroad) for June 2017.

Swedish parent company. In September 2017, Nordea announced that the bank intends to move its parent company from Sweden to Finland. If this happens, it would, for instance, affect who has the main responsibility for Nordea's supervision (see the box "Nordea plans to move its head office to Finland"). However, Nordea will remain part of the Swedish banking system and will still be closely linked to the other major banks. This means that there will be two large foreign bank branches on the Swedish market, which in the event of a crisis will be largely managed by other countries' authorities. The other branch is Danske Bank's operations in Sweden.

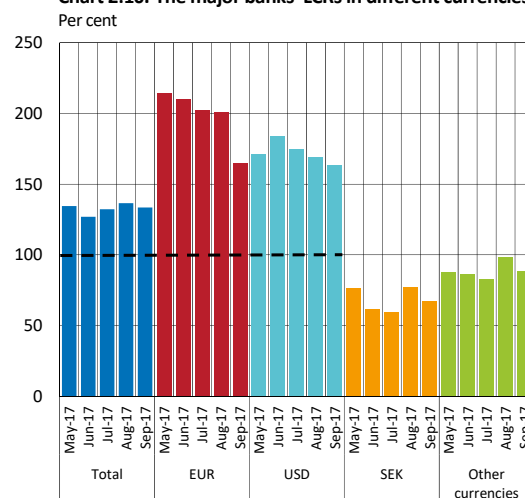
There have also been other structural changes in the financial system that entail both opportunities and risks for the safety of the system. For instance, new and rapidly-growing participants have emerged, who offer mortgages and consumption loans. This can entail increased diversification and less concentration, as well as new and more efficient products and services that match the demand from customers. The developments in FinTech are one example that could lead to many new opportunities. However, some of these rapidly-growing actors have a greater risk propensity than others, they have a large proportion of non-performing loans and they also use new business models that have not been tested previously. It is therefore important to continue to follow this development.

The major banks are exposed to liquidity risks

The Swedish banks are exposed to both short-term and structural liquidity risks (see the article "Short-term liquidity risks in the major Swedish banks").

The short-term liquidity risks can be measured in terms of liquidity coverage ratios, LCRs. LCRs measure the banks' resilience to short-term liquidity stress over 30 days. To meet this requirement, the LCR must be 100 per cent. Over the past six months, the major Swedish banks have continued to report high LCRs in the currencies where there are requirements (see Chart 2:10).²⁴ Periodically, however, some of the major banks have very low LCRs in Swedish kronor in particular and also other significant currencies for which there are no corresponding requirements.²⁵ This means that the banks have greater short-term liquidity risks, measured as LCRs, in these currencies. The banks rely on the foreign exchange swap market to cover their short-term liquidity needs.²⁶ 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

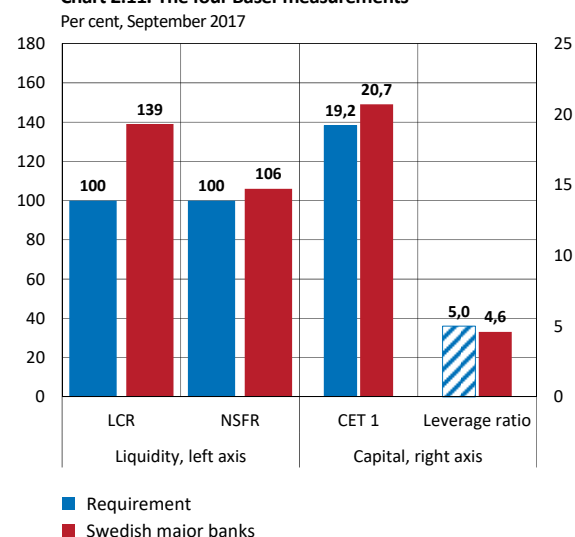
Chart 2:10. The major banks' LCRs in different currencies



Note. Refers to a weighted average. The broken line refers to the level of FI's LCR requirement for all currencies in total, for euros and US dollars.

Source: Finansinspektionen

Chart 2:11. The four Basel-measurements



Note. Minimum leverage ratio is yet to be determined, the chart therefore shows the level that the Riksbank recommends. CET 1 is an abbreviation for Common Equity Tier 1. The minimum requirement for the CET 1 ratio as well as the actual CET1 is calculated as weighted averages. CET1 and the requirement refers to 2017 Q2.

Sources: Bank reports, BIS and the Riksbank

²⁴ The LCR requirements from FI cover euros, US dollars and all currencies in total.

²⁵ 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 2016/61 on LCR.

²⁶ Short-term liquidity risks in significant currencies. Article in *Financial Stability Report* 2016:2. Sveriges Riksbank.

banks that are not fully captured in the LCRs. The fact that a bank attains the minimum requirement for the LCR does not say, for instance, very much about how it would cope with stress that lasted more than a month. A stress test carried out by the Riksbank shows substantial potential liquidity deficits for the major Swedish banks in the case of stress lasting for 90 days (see the article “Short-term liquidity risks in the major Swedish banks”).

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 106 per cent on average for the major Swedish banks (see Chart 2:11), which exceeds the level that the Basel Committee recommends from January 2018. However, the Riksbank does not consider that the NSFR, in its current form, captures the large mismatch in maturities that exists between banks’ assets and liabilities. The NSFR does not capture the difference in maturity for funding of more than one year. This means, for instance, that 13-month financing is regarded in the regulations as equally stable as financing with maturities of longer than 10 years.

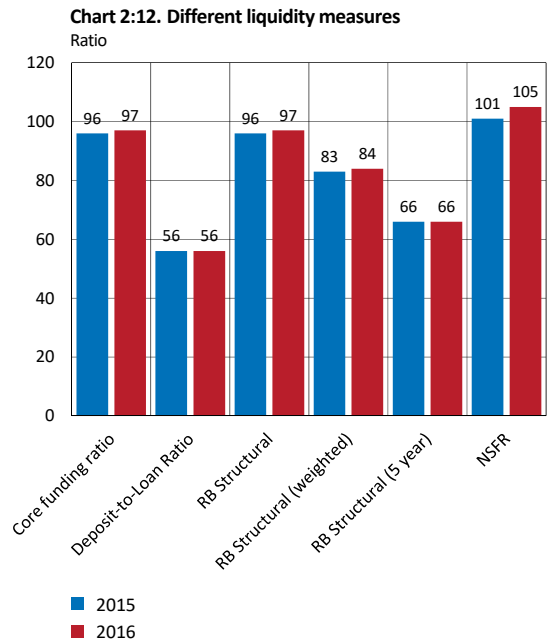
This problem was illustrated in a study published by the Riksbank in autumn 2016. This study highlighted other measures of structural liquidity risk. If one measures liquidity in terms of these alternative measurements, the banks’ liquidity situation has not changed markedly (see Chart 2:12).²⁷

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.

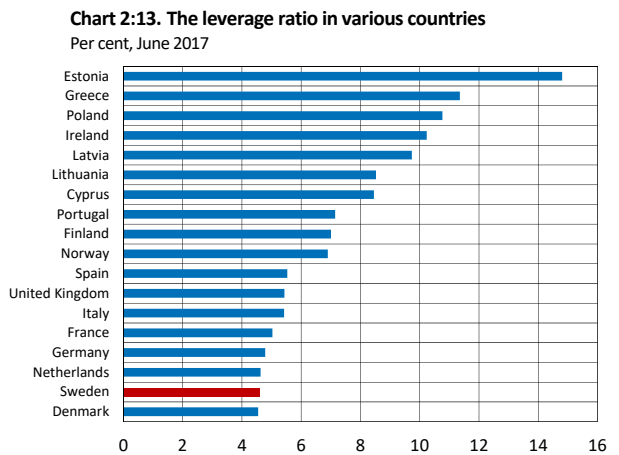
The major banks’ capital in relation to risk-weighted assets (Common Equity Tier 1, CET 1) has remained relatively unchanged recently and was 20.7 per cent in June 2017 (see Chart 2:11). This is a higher level than FI’s requirement, and is probably partly due to the banks allowing for the uncertainty surrounding the forthcoming regulations and how these could conceivably affect the banks’ capital requirements.²⁸

It is positive that the banks have a margin for their capital requirements but there are deficiencies with the risk-weighted capital measurements, as the Riksbank has shown earlier. The Riksbank has therefore pointed out the importance of also introducing a requirement for a leverage ratio that measures the percentage of non-risk weighted capital. The leverage ratio is also largely unchanged at between 4 and 5 per cent on average, which is low in relation to other European countries (see Chart 2:13).



Note. For more information about the different measurements, see The major Swedish banks’ structural liquidity risks, Riksbank Studies, November 2016. Sveriges Riksbank.

Sources: Bank reports, Liquidatum and the Riksbank



Note. Refers to a weighted average per country.

Source: European Banking Authority (EBA)

²⁷ A higher level of the measure showed in the chart indicates lower structural liquidity risks.

²⁸ The banks allow for factors such as a future floor for risk-weighted assets. Final negotiations on the rules for this are currently ongoing in the Basel Committee.

A study by the Riksbank, which takes into consideration both social benefit and costs for capital requirements, indicates that a well-balanced leverage ratio for Swedish banks could be in the interval of 5–12 per cent.²⁹

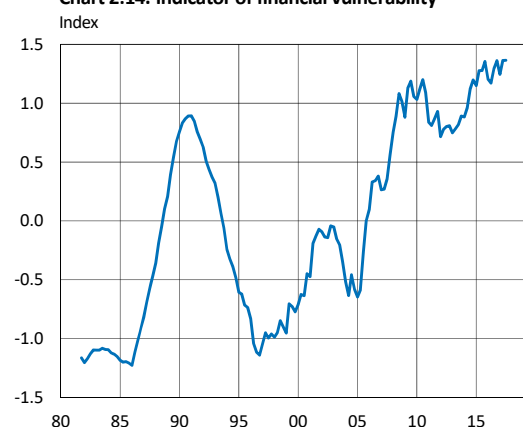
Vulnerabilities and risks associated with low and rising interest rates

Interest rates in Sweden and abroad have been low for a long time. Structural factors such as increased global saving have contributed to global real interest rates being pushed down.³⁰ As a consequence of this and weak economic developments, many central banks have cut their policy rates to historically-low levels.

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 indebtedness to an unsustainable level.³¹ In this type of situation, the probability of severe price falls and increased volatility on asset markets increases, which in turn involves a risk to financial stability. The indicator of vulnerability in the financial system recently presented by the Riksbank in an economic commentary also shows that the vulnerabilities are historically high (see Chart 2:14).³² This rise is being driven by factors including increased lending to households. At the same time, total debt in Sweden has increased over a long period of time, indicating that more factors than just low interest rates have contributed to increased indebtedness (see Chart 2:15).

As described, housing prices have been rising rapidly for a long time. Prices of Swedish commercial property and equity prices have also increased substantially. The equity valuations are currently higher than prior to the financial crisis in 2008 and prior to the IT bubble bursting in the early 2000s (see Chart 2:16). The increased asset prices appear to be due to a great extent to fundamental factors, but as these can change rapidly, the development entails risks.³³

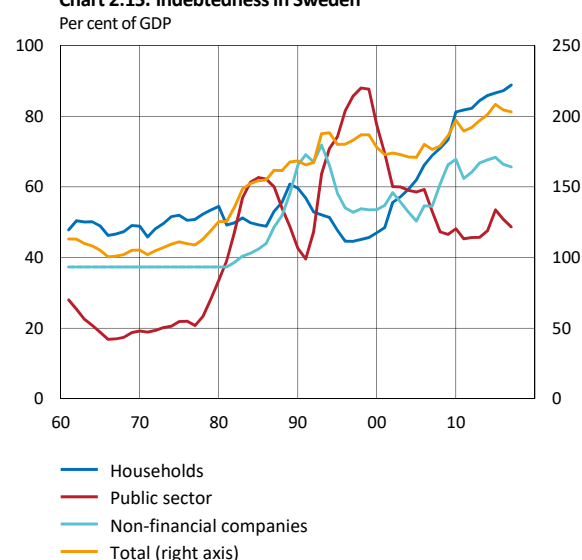
Chart 2:14. Indicator of financial vulnerability



Note. The indicator is based on underlying indicators calculated as a deviation from trend in the banks' lending to households and companies in relation to GDP, real housing prices and non-stable in relation to stable funding of bank lending.

Sources: Statistics Sweden and the Riksbank

Chart 2:15. Indebtedness in Sweden



Note. Public debt includes both central government and local government debts. Corporate debt prior to 1980 is locked at the 1980 level due to lack of data. Corporate debts include market borrowing but not intra-group loans.

Source: Swedish National Wealth Database, Waldenström, Daniel (2016). "The National Wealth of Sweden, 1810-2014." *Scandinavian Economic History Review* 64(1): 36-54

²⁹ The assessments are based on the current banking system. See Almenberg, J. et al. (2017), Suitable capital ratios in major Swedish banks – new perspectives, *Staff Memo*, May 2017. Sveriges Riksbank.

³⁰ The long-term repo rate. Article in Monetary Policy Report, February 2017. Sveriges Riksbank.

³¹ 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.

³² The vulnerability indicator consists to a large degree of weighing together three underlying indicators selected to reflect the vulnerability of different parts of the financial system. The underlying indicators are calculated as a deviation from trend in the banks' lending to households and companies in relation to GDP, real housing prices and non-stable in relation to stable funding of bank lending. 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.

³³ Commercial properties and financial stability. Article in *Financial Stability Report 2017:1*. Sveriges Riksbank.

Low interest rates make banks and insurance companies more vulnerable

There is an international debate on whether sustained low interest rates may be leading banks to start to take greater risks, for example by lending to higher-risk borrowers. Above all, such behaviour may arise in banks that presently have weak profitability and low levels of capitalisation, and which thus need to take greater risks as return on assets falls further due to the low level of interest rates, but it may also arise if there are expectations that the banks shall attain a particular nominal return. In Sweden, however, the banks have continued to show good results despite the low level of interest rates, among other reasons due to high cost efficiency and low loan credit losses. But the Swedish banks' continued high profits can also, to a certain extent, be explained by increased lending, above all with housing and property as collateral.

A long period of low interest rates can also make it more difficult for life insurance companies to fulfil their commitments to policyholders.³⁴ When interest rates are low, for instance, the return on the new bonds which the companies reinvest in when their bonds mature will be lower. The fact that there is a big time difference between when commitments are to be paid out and when the companies' bond holdings mature therefore poses a risk to the companies.³⁵

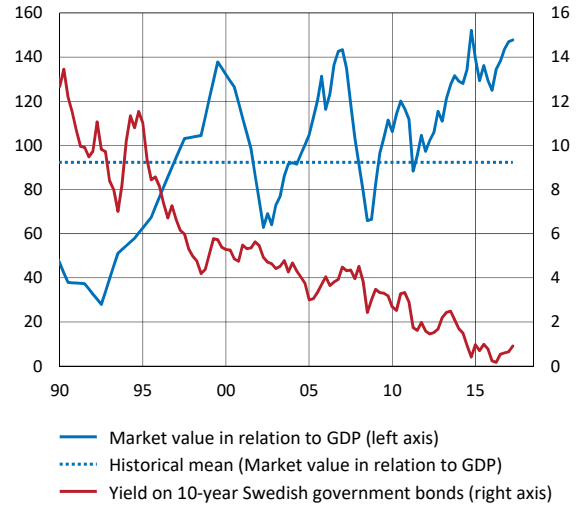
At present, the Swedish life insurance companies have a relatively good financial position. This is partly because their relatively large equity holdings have risen in value (see Chart 2:17). At the same time, the large holdings make them vulnerable to a fall in prices on the stock market. If there were a large fall in prices, they would need to sell off equities 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.

Risks linked to international developments

The fact that Sweden is a small, open economy with a large foreign trade and a financial system that is dependent on the international financial markets means that economic and political uncertainty abroad also poses risks to Swedish financial stability. International economic activity have continued to strengthen and the global economy is expected to grow in line with a historical average. As before, there are some risks, which if they materialise could lead to weaker economic development. However, compared with the situation in the spring, the risks are fewer.

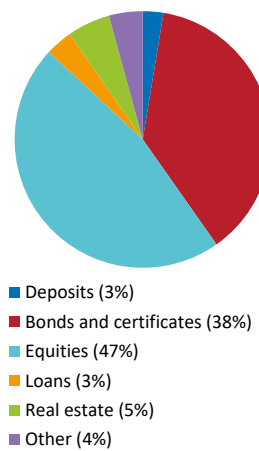
There are risks associated with geopolitical uncertainty. Following elections in several European countries, however,

Chart 2:16. Stock market value in relation to GDP, 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 (SAX Index). Annual data for market capitalisation up until 2002 and quarterly date thereafter. The data refers to the end of each period. Sources: Bloomberg, Statistics Sweden, the World Bank and the Riksbank

Chart 2:17. Insurance companies' assets
Per cent of total assets



Note. The percentage of equities in life insurance companies excludes wholly-owned real estate companies and unit-linked insurance assets. Data refers to 2017 Q2. Source: Statistics Sweden

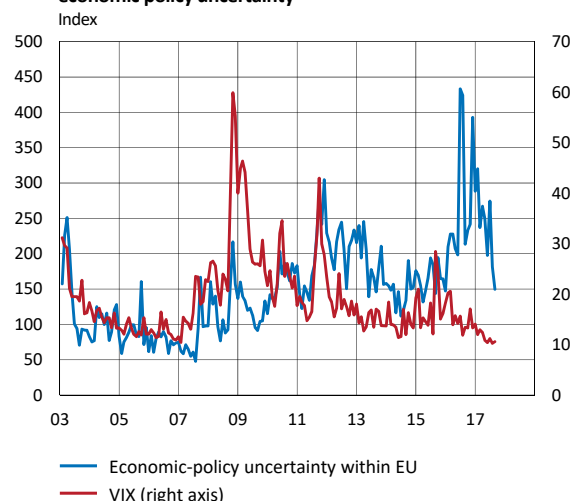
³⁴ EIOPA Insurance Stress Test Report, December 2016. EIOPA.
³⁵ Gibas, N., Juks, R. and Söderberg, J. (2015), Swedish financial institutions and low interest rates, Economic Commentary no. 16. Sveriges Riksbank.

political uncertainty in Europe has declined (see Chart 2:18).³⁶ But there still remain uncertainty factors, such as how the Brexit negotiations between the United Kingdom and the EU will proceed.

The structural problems in the European banking sector remain and can slow down the economic recovery in Europe, including Sweden. Many European banks still have, for instance, a large percentage of non-performing loans on their balance sheets, even if they have declined somewhat in recent years. Non-performing loans comprise around 5 per cent of the total lending in Europe, which is more than in, for instance, the United States and Japan.³⁷ But there are considerable variations within Europe. In some European countries, non-performing loans account for more than 40 per cent of total lending (see Chart 2:19).

Economic activity in Sweden's neighbouring countries is continuing to strengthen. In the Nordic countries (see Chart 2:20) and the Baltic states, the largest domestic and regional financial stability risk is linked to the development of housing prices and household indebtedness. In Denmark, particularly in and around Copenhagen, prices are rising rapidly once again after the large fall prior to the crisis in 2008. In Norway, and especially Oslo, prices of tenant-owned apartments have fallen since the beginning of the year, after rising substantially for many years. As in Sweden, households in Denmark, Norway and Finland are highly indebted. This means that households are vulnerable to changes in economic conditions, such as a heavy fall in housing prices or rising interest rates. If housing prices were to fall broadly, it could affect the real economic and financial stability of the country concerned, but the effects could also spread to other countries in the region through an integrated financial system.

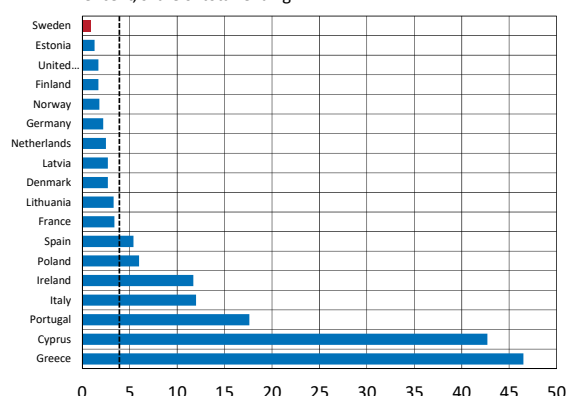
Chart 2:18. Implied equity volatility measured as VIX and economic policy uncertainty



Note. The Baker, Bloom and Davis index of economic policy uncertainty in Europe is based on the number of times that the ten largest newspapers in the five largest economies in the EU refer to policy uncertainty. The index is constructed so that the long-term mean value is 100.

Source: Bloomberg

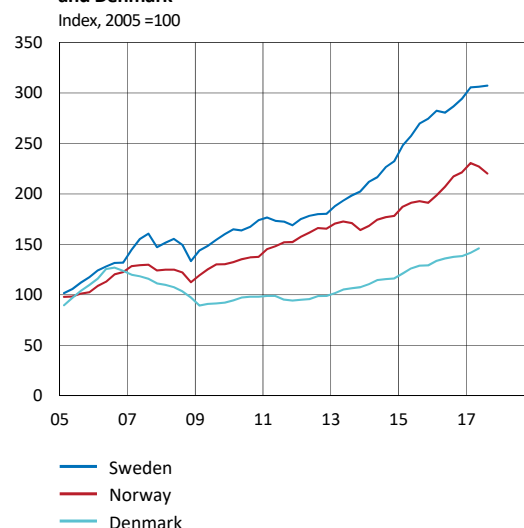
Chart 2:19. Non-performing loans at European banks
Per cent, share of total lending



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. Data refers to 2017 Q2. The dashed line refers to the average share of non-performing loans in European banks.

Source: European Banking Authority (EBA)

Chart 2:20. Tenant-owned housing prices in Sweden, Norway and Denmark



Sources: Statistics Denmark, Statistics Norway and Valueguard

³⁶ Baker, S., Bloom, N. and Davis, S.(2015), Measuring Economic Policy Uncertainty, NBER Working Paper No. 21633, October 2015.

³⁷ According to the ESRB, the percentage of non-performing loans in relation to total loans in the United States and Japan was around 1.5 per cent in 2016.

CHAPTER 3 – Recommendations

Swedish households' high and rising indebtedness forms a palpable threat to financial and macroeconomic stability. It is therefore important to continue to implement measures to increase resilience in the household sector and reduce the risks linked to household indebtedness. At the same time, there are structural vulnerabilities in the Swedish banking system that make it sensitive to shocks. Resilience therefore needs to be strengthened as regards both the banks' capital levels and their ability to manage liquidity risks. It is also important that FI's mandate for taking decisions independently is clarified.

General assessment of the need for measures

Increased resilience among households

Households' high and rising indebtedness form a serious threat to financial and macroeconomic stability. It is therefore important to take measures in several policy areas to improve the functioning of the housing market and increase resilience in the household sector.

Important to be transparent about liquidity risks

The Swedish banks are exposed to liquidity risks. It is therefore important that the banks self-insure by holding adequate liquidity reserves so that they have a good capacity to manage the liquidity risks they take in their operations.³⁸ At present, FI sets requirements regarding the Swedish banks' Liquidity Coverage Ratios, LCR, in all currencies combined, and in EUR and USD. The Riksbank considers that FI should set a requirement in all significant currencies, including SEK.³⁹

It is also important for the major Swedish banks to continue to reduce their structural liquidity risks, for example by obtaining funding with longer maturities.

Furthermore, there are short-term liquidity risks in the major Swedish banks that are not captured by the LCR (see the article "Short-term liquidity risks in the major Swedish banks"). Supplementary measures are therefore also needed to monitor the banks' liquidity risks both in the short and the long term. The Riksbank also considers it important that the banks are transparent about the liquidity risks they take.

Table 3:1. The Riksbank's current recommendations

The mandate for macroprudential policy
The Government and the Riksdag should clarify Finansinspektionen's mandate and tools for macroprudential policy.
Household indebtedness
It is urgent that the Government, the Riksdag and responsible authorities adopt, as soon as possible, further measures to reduce the risks in the household sector by targeted measures within housing policy and tax policy. At the same time, macroprudential policy measures must also be adopted.
Banks' capital levels
Finansinspektionen should introduce, as soon as possible, 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 with the aim of increasing banks' resilience.
The major banks' liquidity risks
Finansinspektionen should set Liquidity Coverage Ratio (LCR) requirements in Swedish kronor for the major banks. The requirement should be set to at least 60 per cent.
Finansinspektionen should set LCR requirements in all significant currencies for the major Swedish banks.
The major Swedish banks should continue to reduce their structural liquidity risks and continue to attain a Net Stable Funding Ratio (NSFR) of at least 100 per cent.
The major Swedish banks should report their LCRs in Swedish kronor and other significant currencies at least once a quarter.
The major Swedish banks should report their Net Stable Funding Ratios (NSFR) at least once a quarter.

³⁸ *Financial Stability Report 2016:2*. Sveriges Riksbank.

³⁹ With effect from 2018, FI's regulations on LCR will cease to apply, as a result of the introduction of EU requirements regarding LCR. It follows on from this that potential liquidity requirements in individual currencies must be introduced from the turn of the year as so-called Pillar 2 requirements.

Requirement for adequate capital in the banks

Given the size of the Swedish banking sector, the vulnerabilities in the banking system and the risks to which the banks are exposed, the Riksbank assesses, as before, that it is essential that FI requires that the major banks hold sufficient capital. The Riksbank's assessment is that FI should introduce a leverage ratio requirement of 5 per cent for the major Swedish banks. The Riksbank also considers that FI should tighten the requirement regarding the countercyclical capital buffer to 2.5 per cent.

On an international level, there are plans for supplementary regulation within the Basel framework that could entail further capital requirements for a number of banks in the future. The Riksbank welcomes new regulations that help to strengthen global financial stability and are important for Sweden, which has a large banking sector and, at the same time, a small and open economy.

Bearing in mind the risks in individual countries, the Riksbank moreover considers it important that national supervisory authorities have the possibility to place additional capital requirements over and above international regulations.

Recommendation regarding the mandate for macroprudential policy

The Government and the Riksdag should clarify Finansinspektionen's mandate and tools for macroprudential policy.

In Sweden, the Government has given FI the main responsibility for macroprudential policy. However, the regulations do not give FI a sufficiently clear legal base to use the tools required to counteract financial imbalances. This is delaying and obstructing the introduction of necessary measures that, for instance, mitigate the risks posed by household indebtedness.

The ESRB recommended as early as 2011 that macroprudential policy authorities should have operational independence.⁴⁰ On 26 October 2017 the Swedish Government decided to put forward a bill that aims to give FI legislative support with regard to additional measures to counteract financial imbalances in the credit market, such as household indebtedness. The bill also means that the process for how and when measures shall be implemented will be clearer and shorter. The Riksdag (Swedish parliament) is expected to take a decision on the bill in December, and it is

⁴⁰ Recommendation of the European Systemic Risk Board on the macro-prudential mandate of national authorities (ESRB/2011/3), December 2011. European Systemic Risk Board (ESRB).

proposed that the regulations come into force on 1 February 2018.⁴¹

The bill is a step in the right direction. However, it is suggested there that FI's regulations regarding the application of tools shall be subject to the Government's consent. The Riksbank considers that there are better ways of meeting the Government's need for control, as the proposal reduces the scope for flexibility and can make it more difficult for FI to take rapid action. One way of achieving this would be for the Government to decide which macroprudential policy tools to delegate to FI and within what framework FI may apply them. FI will then decide on measures within this framework. The system advocated by the Riksbank is in line with the ESRB's recommendation for macroprudential policy.

Recommendation on measures to reduce risks linked to household indebtedness

It is urgent that the Government, the Riksdag and responsible authorities adopt, as soon as possible, further measures to reduce the risks in the household sector by targeted measures within housing policy and tax policy. At the same time, macroprudential policy measures must also be adopted.

As before, the Riksbank's overall assessment is that it is important to introduce further measures to reduce the risks linked to household indebtedness. The Riksbank considers that a combination of different measures is required – in several different policy areas.^{42,43} A large increase in the repo rate could slow down the build-up of debts but would also lead to higher unemployment, a much stronger krona and lower inflation. Macroprudential policy measures that are more specifically aimed at reducing the risks associated with household indebtedness have less negative effects on the economy as a whole.

Above all, the reasons why indebtedness is rising need to be tackled. The poor functioning of the housing market is one important reason (see Chapter 2). Even if the supply of housing is expected to continue to increase in the coming years, measures are needed to attain a better functioning housing market and create a better balance between supply and demand for housing, and thus reduce the risks linked to households' high indebtedness.

One reason that the housing market is functioning poorly is that the rent-setting system restricts supply and leads to lock-in effects that make it particularly difficult for young

⁴¹ The Riksdag is expected to take a decision on this on 13 December 2017. https://www.riksdagen.se/sv/dokument-lagar/arende/betankande/ytterligare-verktyg-for-makrotillsyn_H501FIU19

⁴² Measures to manage financial risks in the household sector. *Financial Stability Report 2015:1*. Sveriges Riksbank.

⁴³ 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.

people and people who are not yet established on the housing market to find housing. More alternatives for renting accommodation would probably lead to the housing being constructed better corresponding with demand. It is also important to have measures that will lead a more efficient use of the existing housing stock.⁴⁴

The taxation system has also contributed to imbalances in the housing market. Tax reforms are also needed, therefore, to contribute to a balanced increase in housing prices and to reduce the willingness and capacity of households 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, and thus contribute to dampening the increase in housing prices and household debt, a review is needed of capital gains taxation when homes are sold, of property taxation and of the current tax relief on interest expenditure.⁴⁵ This does not necessarily mean that total taxation must increase to restrain this development.

With regard to macroprudential measures, FI has introduced an amortisation requirement and a mortgage cap. In addition, FI has recently proposed a stricter amortisation requirement targeting households with high debts in relation to income. The Riksbank supports the proposal and considers it important that the Government takes a decision on this question, so that the stricter amortisation requirement can be implemented quickly (see the article “The Riksbank supports Finansinspektionen's proposal for stricter amortisation requirements”).

Going forward, further macroprudential policy measures may be necessary, depending on how effective already adopted and proposed 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. If necessary, a potential macroprudential policy measure could be to introduce a debt-to-income limit that restricts how much a household may borrow in relation to its income.⁴⁶ A further possible measure could be to review the regulations for paying off mortgages earlier, so that households have greater incentives to choose loans with longer interest-rate fixation periods.⁴⁷ This would make households less sensitive to interest rate adjustments. Such a measure could be particularly important after a long period of

⁴⁴ On 21 June 2016, the Government put forward 22 proposals aimed at increasing housing construction. See *Sammanfattning av regeringens förslag (summary of the Government's proposals), memorandum*, June 2016. Government Offices of Sweden.

⁴⁵ Sweden's costs for the tax relief amount to around SEK 20 billion. The costs are expected to rise when interest rates increase.

⁴⁶ Effects of a debt-to-income limit. Fact box in *Financial Stability Report 2016:2*. Sveriges Riksbank.

⁴⁷ 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.

very low interest rates. FI could also set minimum requirements for banks' standard values in their discretionary income calculations⁴⁸, which form part of their credit assessments, so that households have larger financial buffers when being granted mortgages.

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. This would strengthen the 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.

It would be desirable if the debt sum used as a basis for the debt-to-income ratio in the proposed stricter amortisation requirement included all of the borrowers' loans. For this to be possible, a nationwide, comprehensive credit information service is required, where data on households' assets is available. There is no such service at present. It would therefore be good if the possibility to provide such a service was investigated. 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.

Recommendations regarding 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 major Swedish banks' risk-weighted capital requirements have been increased in recent years and are currently higher than the international minimum requirements. However, there are flaws in the risk-weighted capital requirements, which in some cases can lead to banks underestimating their risks and therefore holding too little capital. The Riksbank considers it important, therefore, that a non-risk-weighted capital requirement, in the form of a leverage ratio requirement, be introduced as soon as possible for the major Swedish banks as a complement to the risk-weighted capital requirements.

A leverage ratio requirement can be used to ensure that the 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. This is in line with the leverage ratio

⁴⁸ Banks are already obliged to carry out credit checks to ensure that borrowers can fulfil their undertakings. As part of these checks, banks draw up so-called discretionary income calculations.

requirement the Basel Committee agreed on earlier.⁴⁹ It is important that the requirement is implemented in line with the decision of the Basel Committee.

Several countries with large and interlinked banking systems have decided to introduce a leverage ratio requirement higher than the coming international minimum level. This includes Switzerland, the United Kingdom and the United States. A comparison with other European countries shows that banks in every country except Denmark have higher average leverage ratios than Swedish banks. Given the size and the vulnerabilities of the Swedish banking sector, the Riksbank believes that Sweden should also have a higher leverage ratio requirement than the coming international minimum. However, the Riksbank considers that the requirement should be set at 5 per cent.⁵⁰ The requirement could take the form of a minimum requirement of 3 per cent with an additional national buffer requirement of 2 per cent.

New calculations by the Riksbank indicate that a socio-economically well-balanced level for the banks' leverage ratio is somewhere in the interval of 5–12 per cent.⁵¹ 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 it may be socio-economically profitable to have a much higher requirement.

Finansinspektionen should set the countercyclical capital buffer value at 2.5 per cent with the aim of increasing banks' resilience.

The countercyclical capital buffer aims to strengthen the resilience of Swedish banks when systemic risks accumulate, that is, before they actually materialise. FI has decided to raise the countercyclical capital buffer level in Sweden from 1.5 to 2 per cent, which applies from 19 March 2017. However, the Riksbank's assessment is that the countercyclical capital buffer level should be raised further and set at 2.5 per cent, given the systemic risks that have built up over several years, partly as a result of the banks' increased lending to the general public.

⁴⁹ Revised market risk framework and work programme for the Basel Committee is endorsed by its governing body, *press release*, January 2016. Bank for International Settlements.

⁵⁰ According to the Basel Committee's definition.

⁵¹ The assessments are based on the current banking system. See Almenberg, J. et al. (2017), *Suitable capital ratios in major Swedish banks – new perspectives*, *Staff Memo*, May 2017. Sveriges Riksbank.

Recommendations regarding the major banks' liquidity risks

Finansinspektionen should set Liquidity Coverage Ratio (LCR) requirements in Swedish kronor for the major banks. The requirement should be set to at least 60 per cent.

The major Swedish banks have periodically had very small liquidity buffers in SEK (see Chart 3:1). Some of the major banks have at times had LCRs of only around 10 per cent. If one assumes that the cash flow is even over a month, an LCR of 10 per cent in SEK would mean, put simply, that a bank could meet its liquidity requirement in SEK for around 3 days. This indicates that the preparedness for unexpected cash outflows in SEK is at times too low. To ensure that the banks' liquidity in SEK does not fall too low, FI should set an LCR requirement for SEK.⁵² The requirement should be set to at least 60 per cent.

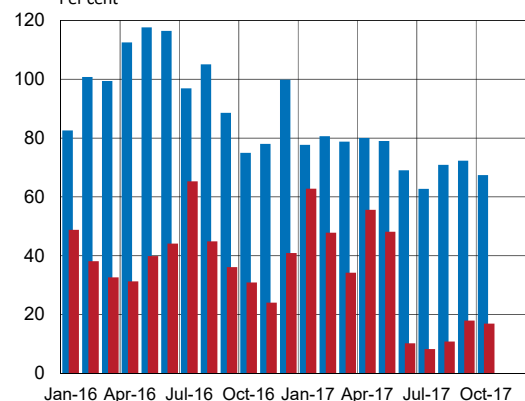
Finansinspektionen should set LCR requirements in all significant currencies for the major Swedish banks.

Along with Swedish kronor, US dollars and euros, which are significant currencies for all the major Swedish banks, sterling and some of the Nordic currencies are also significant for the banks, albeit to a varying extent. The major Swedish banks choose to retain most of their liquidity buffers in euros and dollars, while the buffers in other significant currencies are often way below the requirements. This means that the LCRs in EUR and USD are often higher than the quantitative minimum requirements, while the ratios in certain other significant currencies are much lower. This implies that the banks are more vulnerable in the event of liquidity stress in these currencies. Low resilience to liquidity stress can threaten financial stability in the long run. It is of utmost importance for the banks to insure themselves against their short-term liquidity risks. The Riksbank therefore recommends that FI set LCR requirements in all significant currencies to ensure that the banks' liquidity in these currencies does not fall too low. This enables them to reduce their dependence on the foreign exchange swap market and also limits the risk of contagion, should one bank encounter liquidity problems.

The major Swedish banks should report their LCRs in Swedish kronor and other significant currencies 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. As this limits the possibility of assessing the banks' liquidity risks, investors may find it difficult to price the risk they take in full. It is

Chart 3:1. The major Swedish banks' daily LCR in kronor
Per cent



■ Average daily observations, all banks
■ Single lowest observation

Note. Average daily LCR in kronor each month and the single lowest observation.

Source: The Riksbank

⁵² The Basel Accord states that a bank shall have liquid assets that can meet the outflows in all significant currencies.

therefore important that the major Swedish banks also report their LCRs in Swedish krona and in all significant currencies 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 has developed on a daily basis.

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 NSFR is an internationally agreed measure that makes it possible to monitor the development of structural liquidity risks over time and between banks. According to the Basel Committee's recommendation, the banks shall attain a minimum NSFR level of 100 per cent from 2018.⁵³ It is positive that the Swedish banks, with a large proportion of market funding, meet this level already. During the period June 2016–June 2017, the four major Swedish banks had, on average, an NSFR of 106 per cent (see Chart 3:2), and the lowest values observed for individual banks during the same period indicate levels of around 100 per cent. But it is important to ensure that the banks continue to attain the minimum level.

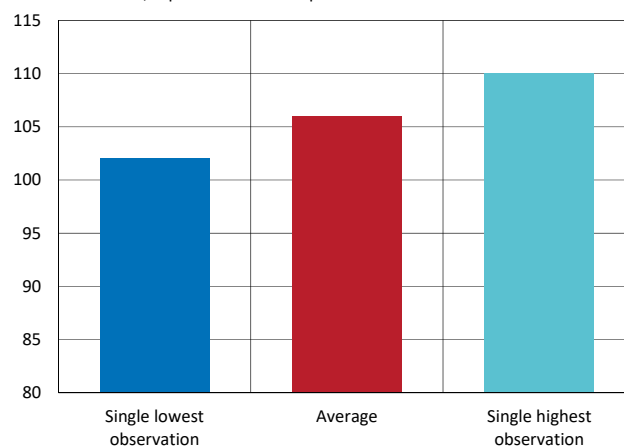
However, the NSFR is a measurement that does not fully reflect the banks' structural liquidity risks. More specifically, the banks can fulfil the requirement while still taking relatively substantial structural liquidity risks. In contrast to the NSFR, if one takes into account the maturity structure of a bank's funding after 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 major Swedish banks to continue to reduce their structural liquidity risks, for example by obtaining funding with longer maturities.

The major Swedish banks should report their Net Stable Funding Ratios (NSFR) at least once a quarter.

At present, Swedbank and Handelsbanken report NSFR in public income statement reports. The Riksbank considers that it would be desirable for the other major banks to also increase transparency regarding their structural liquidity risks by reporting their NSFR.

The Riksbank also urges the major banks to report which structural liquidity risks they take at longer maturities than one year. This would increase understanding of the structural liquidity risks to which the banks are exposed. There are also reasons to develop supplementary measurements to the NSFR, which better capture the banks' structural liquidity risks.⁵⁴

Chart 3:2. The major Swedish banks' lowest, average and highest monthly NSFR
Per cent, September 2016 to September 2017



Note. Every month the Riksbank collects the major banks' NSFRs in accordance with the Basel Committee's final definition. The chart shows the average and the single highest and lowest observations for the four major banks during the period.

Source: The Riksbank

⁵³ The same minimum level is included as a proposal for a requirement in the European Commission's banking package.

⁵⁴ The major Swedish banks' structural liquidity risks, *Riksbank Studies*, November 2016. Sveriges Riksbank.

ARTICLE – The Riksbank supports Finansinspektionen's proposal for stricter amortisation requirements

It is the Riksbank's assessment that high and rising household indebtedness poses the greatest risk to the Swedish economy. It is therefore important to continue with measures to increase resilience in the household sector and reduce the risks. The Riksbank therefore supports FI's proposal for a stricter amortisation requirement aimed at households with high debts in relation to income.

Proposal for stricter amortisation requirement

FI has proposed that a stricter amortisation requirement, aimed at households with high debts in relation to income, be introduced on 1 March 2018. This proposal means that new mortgage borrowers with mortgage debts exceeding 4.5 times their income before tax shall amortise at least 1 per cent of their debts, in addition to the existing amortisation requirement.⁵⁵ This means that, if a new mortgage borrower has debt exceeding 4.5 times their pre-tax income, that borrower would have to amortise 1 per cent of their mortgage per year if their loan-to-value ratio is below 50 per cent. If the loan-to-value ratio is higher, between 50 and 70 per cent, amortisation increases to 2 per cent and then to 3 per cent if the loan-to-value ratio is over 70 per cent.

In a consultation response, the Riksbank has expressed support for FI's proposal. The Riksbank also considers that the proposal is important in light of the most recent development of the housing market, with prices that have fallen over the autumn, and unease that prices will continue to fall and that housing construction will come to a standstill in the period ahead.

Only highly-indebted households will be affected

The tightened amortisation requirement is thus aimed at the households choosing to take up large loans. For the vast majority of households, the consequences will be limited as currently most new mortgage holders already borrow less than 450 per cent of their pre-tax income. This could partly be because many of the banks already set a limit on debt in relation to income. Only 15 per cent of those taking out new mortgages are expected to be covered by the new rules. In Stockholm, the corresponding figure is 30 per cent and, in Göteborg, 19 per cent. These figures are based on an assumption that borrowers will not adjust their behaviour. However, as

this measure only applies to new borrowers, they will have an opportunity to adjust by purchasing cheaper housing. This would mean that fewer people would be affected by the requirement. Similarly, most macroprudential policy measures previously introduced by FI have been aimed at new borrowers. This means that it will take a long time before the measures have an effect on the entire mortgage stock. In addition, tax policy measures such as tax relief, which could have affected the stock, were not introduced. The Riksbank's assessment is that FI's new proposal will also have limited effects on the housing market and household consumption and thereby on current economic developments. But by contributing to the prevention of household indebtedness from continuing to grow faster than incomes, the proposal may help slow down the continued upwards spiral in which higher debts bring about higher housing prices, thereby bringing about even higher debts.

The requirement may contribute towards reducing risks

Nevertheless, it cannot be ruled out that a tightened amortisation requirement could lead to falling housing prices. In such a case, this would indicate that the development of prices in recent years has been driven by the relatively small group of highly-indebted households covered by the amortisation requirement and which would adjust by purchasing cheaper housing instead of accepting faster amortisations. But the economy as a whole hardly benefits from a price development based on high indebtedness and low or non-existent amortisation when the level of interest rates is very low. Prices could then be pushed up to levels that are not sustainable when the level of interest rates is higher. Households unwilling to take major risks would then find it difficult to find suitable housing. Measures leading to a more restrained development of housing prices may then make it easier

⁵⁵ The existing amortisation requirement means that new borrowers need to amortise 1 per cent per year if the loan-to-value ratio is between 50 and 70 per cent, and 2 per cent per year if the loan-to-value ratio is over 70 per cent.

for young households to enter the housing market, for example.

The most recent discussion on the risk that housing prices are on the way towards a downturn should make it clear that it cannot be assumed that housing prices will always rise. 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 falls below the debt. Households may then find it difficult to adjust their housing and hence their housing expenses to changed economic conditions. From the perspective of consumer protection, it is therefore hardly desirable for households to be allowed or tempted to take large debts that are not amortised. But such lock-in effects on the housing market will also become a problem for the economy at large if they affect many households, as this may impair the functioning of both the housing market and the labour market. In a situation in which economic conditions become significantly worse than expected, highly-indebted households may substantially reduce their consumption, which could affect the profitability of Swedish companies and, ultimately, increase the banks' loan credit losses and impair their ability to obtain funding. Households' high indebtedness thus entails risks both for individual households and for financial and macroeconomic stability. The tightened amortisation requirement could contribute towards reducing these risks.

The Riksbank supports FI's proposal

The Riksbank considers it important to continue to apply measures to increase the resilience of the household sector and reduce the risks on the housing market and the risks connected with households' high indebtedness and therefore supports FI's proposal for a tightened amortisation requirement. It is important that the Government takes a decision in this matter, so that the tightened amortisation requirement can be implemented rapidly. During this period of low interest rates, highly-indebted households have a good opportunity to amortise and strengthen their resilience against shocks.

ARTICLE – Household indebtedness and interest rate sensitivity

Household indebtedness is high and has been rising for a long time. As most loans are taken out at a variable rate, households' interest expenditure would increase rapidly if interest rates started to increase. This article shows that highly indebted households are more sensitive to rising interest rates than other households. It also examines by how much interest expenditure is calculated to rise if interest rates increase. The analysis shows that interest expenditure will remain on a low level for most households if rates increase by 1 percentage point. Sharper increases, on the other hand, could lead to major consequences for financial and macroeconomic stability. If household indebtedness continues to increase more rapidly than incomes, households will become increasingly sensitive to economic downturns as well as disruptions in their private finances. It is therefore important to increase households' resilience.

High household indebtedness creates vulnerabilities

Over the last ten years, households' nominal debts have doubled and currently amount to almost SEK 4,000 billion. 260,000 households have an indebtedness that exceeds 600 per cent of their disposable income. A high and rising level of household indebtedness constitutes a risk to financial and macroeconomic stability in Sweden. Rising indebtedness among households also increases the likelihood of economic downturns and financial crises, and amplifies their length and intensity.⁵⁶

When interest rates rise, households with higher debt-to-income ratios cut down on their consumption more than households with lower debt.⁵⁷ Since Swedish households are more indebted than ever before, the risk that household consumption will decrease when interest rates increase is also greater than ever.

Several factors driving the build-up of debt

A number of factors have contributed to the increase in household indebtedness over time. As the household debt is mainly made up of mortgages, it is closely connected to how housing prices have developed. Over the last 20 years, single-family house prices have tripled. Prices of tenant-owned apartments have increased at an even faster rate. These price rises are due to a high demand for housing, which in turn is a consequence of an increase in both the population and incomes, while structural factors have contributed to limiting supply (see Chapters 2 and 3). Tax relief on interest expenditure, the abolition of property tax and the increased proportion of the

population now owning their own homes are other factors that could explain why private indebtedness has increased.⁵⁸

Interest rates are low now ...

Another important reason why indebtedness has increased and continues to do so is the low level of interest rates. Nominal and real interest rates have fallen worldwide over the last 20 years and household mortgage rates are very low from a historical perspective.⁵⁹ Currently, about 2.5 per cent of disposable household income goes to interest expenses. This share has been falling since 2012, despite debt increasing faster than incomes.

An obvious risk associated with low interest rates is that households might not take into account that interest rates might be much higher in the future. If households expect low rates to last for a very long time, they may end up borrowing too much in relation to their income. This may lead to a reduction in consumption if expenditure for mortgages rises sharply in relation to incomes.

The National Institute of Economic Research's survey shows that households expect mortgage rates to rise in the years ahead.⁶⁰ The extent to which households consider these expectations when they decide to borrow is uncertain, however. Interest rate expectations also seem to be backward-looking. During 2010, when rates rose, households' expectations of the future mortgage rate were lower than the actual average mortgage rate (see Chart B1).

⁵⁶ Schularick, M. and Taylor, A.M. (2009), Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870–2008. *American Economic Review* 102(2), and Mian, A., Sufi, A. and Verner, E. (2017), Household debt and business cycles worldwide. *Quarterly Journal of Economics*.

⁵⁷ Flodén, M., Kilström, M., Sigurdsson, J., och Vestman, R. (2017), Household debt and monetary policy: revealing the cash-flow channel. *Riksbank Working Paper* No. 342, september 2017. Sveriges Riksbank.

⁵⁸ Hansen, S. (2013), Explanations of the development of household indebtedness since the mid-1990s, *PM 1*. Finansinspektionen.

⁵⁹ See The long-term repo rate. Article in *Monetary Policy Report*, February 2017. Sveriges Riksbank.

⁶⁰ Hjalmarsson, E. and Österholm, P. (2017), Households' mortgage rate expectations – more realistic than at first glance? *Economic Review*, November 2017, Sveriges Riksbank, and Österholm, P. (2017), Are household expectations of future mortgage rates realistic?, *Ekonomisk Debatt* 45, no. 5.

Chart B1. Household expectations of the mortgage rate
Per cent



Note. The average mortgage rate refers to the realised mortgage rate one year after the question was asked.

Sources: The National Institute of Economic Research and Statistics Sweden

... but are expected to rise

In the Riksbank's main scenario in the latest Monetary Policy Report, the repo rate is expected to rise by about 1 percentage point up until 2020. Increased rates are quickly passed on to borrowers as almost 70 per cent of all loans are variable-rate.

However, household interest rates can increase much more, or much quicker, than in the main scenario. If shocks occur on the financial markets, or if investor confidence in Swedish banks is undermined, in the event of a sharp fall in housing prices for example, this may lead to banks' funding and ultimately household borrowing becoming much more expensive.

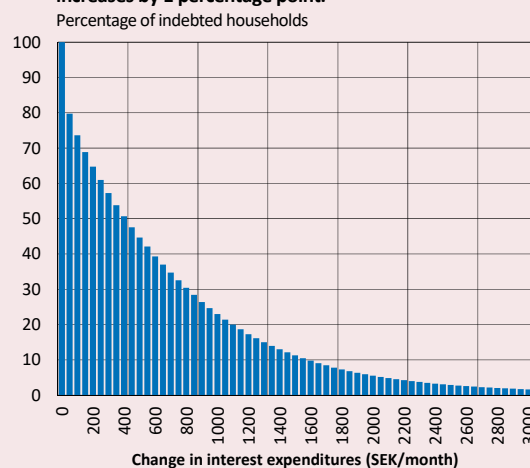
With this in mind, the analysis in this article assumes not only a rate increase of 1 percentage point but also a greater rate rise of 5 percentage points. Such an increase would bring the rate into parity with interest rates from 2008.

Households' interest expenses when rates rise

Based on household debt level data,⁶¹ it can be shown how much interest expenses would increase if rates go up, all other factors being equal. Chart B2 shows the share of indebted households that would have unchanged or up to SEK 3,000 higher interest expenses if rates increased by one percentage point. The chart shows that if the rate increases by 1 percentage point, interest expenses rise by at least SEK 400 per month for 50 per cent of indebted households. But there are major differences: for 11 per cent of the households (about 300,000 households)

included in this data, interest expenses would increase by at least SEK 1,500.

Chart B2. Additional interest expenses, when the interest rate increases by 1 percentage point.



Note. The amounts have been adjusted for tax relief on interest payments. The chart is designed so that it is possible to see the share of indebted households that would see their interest expenses increase by at least the figure given on the x-axis. This data does not include the interest rate level or interest-rate fixation period chosen by the household. For simplicity's sake, it is assumed that the interest rate for all households increases by 1 percentage point.

Source: The Riksbank.

Table B1 shows the debt service (interest and amortisation) payments for three household categories: households with a median debt of around SEK 700,000, households with a debt level of around SEK 1.6 million (75th percentile) and highly indebted households with a debt of SEK 3.5 million (95th percentile).

When calculating debt service payments, it is assumed that the actual interest rate is 2 per cent and that the household pays off its loans over 40 years.⁶² Based on these assumptions, the three household categories currently pay SEK 2,275, SEK 5,200 and SEK 11,375 per month. If the debt is held constant, a 1 percentage point increase in the interest rate leads to a 50-per cent rise in households' interest expenses. This would mean that debt service payments in total would amount to between SEK 2,683 and SEK 13,417 per month. In the alternative scenario where the interest rate rises by 5 percentage points, debt service almost doubles.

⁶¹ This data is from the eight largest banks in Sweden. See Blom, K. and van Santen, P (2017), Household indebtedness in Sweden – update for 2017, *Economic Commentaries* No. 6. Sveriges Riksbank.

⁶² The median number of years until mortgage is repaid is about 40 years.

Table B1. Mortgage payments for three household categories

SEK per month			
Debt level	50th percentile (median)	75th percentile	95th percentile
Debt	700,000	1,600,000	3,500,000
Interest payments	817	1,867	4,083
Amortisation	1,458	3,333	7,292
Mortgage payment	2,275	5,200	11,375
Scenario			
Mortgage payment (+1%)	2,683	6,133	13,417
Mortgage payment (+5%)	4,317	9,867	21,583

Note. The interest rate is assumed to be 2 per cent. Remaining amortisation period set at 40 years. All amounts given in Swedish kronor per month and adjusted for tax relief on interest payments.

Source: The Riksbank

The rise in household debt in recent years has made households more sensitive to interest-rate changes. Table B2 shows interest payments for a typical housing purchase in 2004 and 2016. Households who, during this period, bought an averagely priced home financed by means of a mortgage with an average loan-to-value ratio at the average current interest rate have approximately the same interest expenses. This is true for both the Stockholm region as well as for the country as a whole. This is explained by the fact that the interest rate has fallen during this period. However, those who bought a home in 2016 are significantly more sensitive to rising rates than those who bought in 2004. If the rate is increased by 1 percentage point, monthly payments rise by about SEK 1,100 on average for those who bought a home in 2016 in Sweden, and by SEK 2,200 if the home was bought in Stockholm. This amounts to more than a doubling compared with the increase for those who bought a home in 2004, when the average indebtedness was much lower. The increased sensitivity is obviously even clearer in the alternative scenario, where interest payments rise by 5 percentage points (see Table B2).

Table B2. Interest payments for a typical housing purchase

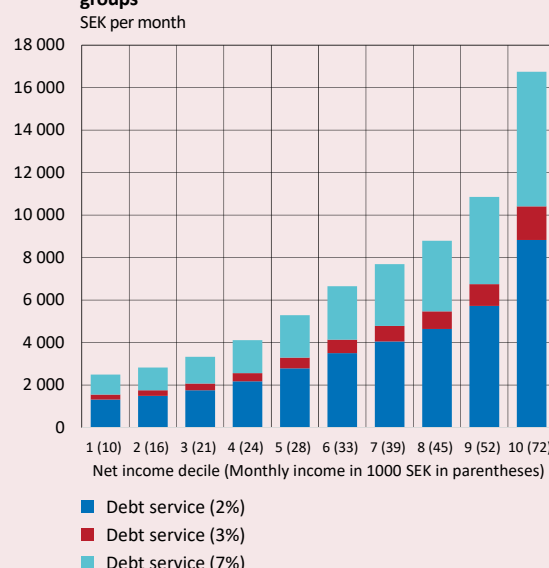
SEK per month				
Region	Sweden		Greater Stockholm	
	2004	2016	2004	2016
Year	2004	2016	2004	2016
Housing price (SEK million)	1.34	2.77	2.58	5.58
Loan-to-value ratio (%)	62	69	62	69
Debt (SEK million)	0.83	1.91	1.60	3.85
Interest rate (%)	3.7	1.6	3.7	1.6
Interest payments	1,793	1,784	3,452	3,594
Scenario				
Interest payments (+1%)	2,278	2,899	4,386	5,839
Interest payments (+5%)	4,216	7,359	8,118	14,823

Note. The amounts have been adjusted for tax relief on interest payments. The table does not include amortisation payments.

Sources: Finansinspektionen, Statistics Sweden and the Riksbank

With rising interest rates, debt service increases the most for high-income households

To be able to assess the consequences of rising interest rates, household income must also be considered in the analysis. Chart B3 shows debt service amounts at different interest rate levels for different income groups.⁶³ The debt service payment for the highest income group amounts to just over SEK 16,000 per month when the interest rate is 7 per cent. This means that debt service payments would comprise about 20 per cent of disposable income for the highest income group. For those with the lowest incomes, the proportion of disposable income going to mortgage payments will be about the same as for those with the highest incomes. The corresponding figure for other groups is between 15 and 20 per cent.

Chart B3. Mortgage payments in different income decile groups

Note. Mortgage payments are calculated with an interest rate of 2, 3 and 7 per cent. Amortisation period set at 40 years. Interest expenses adjusted for tax relief.

Source: The Riksbank.

In addition to debt service payments, households also have other housing-related expenses, including insurance and maintenance costs and housing association fees. As housing associations are also indebted, annual fees may need to be increased if interest rates rise (see Chapter 2).

Consumption can decrease when interest rates rise

As described above, rising interest rates will lead to an increase in households' debt servicing expenditure. This is particularly true when interest rates are at a low level

⁶³ The result for income group 1 should be interpreted with a certain amount of caution as this group includes households with highly varying incomes. Neither can this analysis take account of tax-free sources of income such as child or housing

allowances, which form important sources of income for households in income group 1.

(when even small changes in interest rate levels imply a high growth rate of for interest expenditure) and debt-to-income ratios are high.⁶⁴ The combination of low interest rates and rising indebtedness therefore makes Swedish households sensitive to changes in the interest rate.

It is primarily highly indebted households who are exposed to greater risks when interest expense rises rapidly and who consequently may need to reduce their consumption. The increased debt servicing expenditures in the main scenario are, however, relatively small for most households. In the event of larger interest rate increases, however, debt service payments may rise sharply for all groups, with potentially severe consequences for macroeconomic and financial stability.

The effect of rising interest rates on consumption also depends on how housing prices develop. The forecast in the Riksbank's latest Monetary Policy Report is that the growth rate in housing prices will slowdown.⁶⁵ A situation in which housing prices fall more than in this scenario, at the same time as interest rates increase, could lead to a reduction of consumption. Consumption could also decline even if there is no direct decrease in housing prices, and even if interest rates would not increase faster than in the Riksbank's main scenario, especially if expectations of future housing prices and interest rates change.

Several factors can dampen the effects on consumption

There are also factors that can counteract the effects of interest rate increases on consumption. Certain households will, for example, be able to compensate for rising debt servicing payments by reducing their saving. Household savings are currently on an historically high level. These high savings could serve as a cushion for adverse changes in the households' economic situation, such as higher interest expenditure or unemployment. There is no information on how assets and savings are distributed among households, however, and it is therefore not clear how much savings the most indebted households have. There are indications, however, that households with high debts in relation to their incomes have relatively small liquid assets in relation to their incomes. These households will probably have to reduce their consumption if interest expenses increase heavily.⁶⁶

Household indebtedness will have consequences for economic decision-making

Higher indebtedness has made households sensitive to rising interest rates. If indebtedness continues to increase more rapidly than incomes, households will become increasingly sensitive to economic downturns as well as disruptions in their private finances. It is therefore important to increase resilience in the household sector.

Furthermore, the increased interest-rate sensitivity of households may have consequences for economic policy in several areas. With increased indebtedness and interest-rate sensitivity, it follows that a change to the Riksbank's policy rate would have a greater effect on households' debt service payments and thereby on their scope for consumption. This implies a strengthening of the effects of monetary policy on inflation.⁶⁷ Household interest rate sensitivity also means that conditions for conducting fiscal policy may change, influencing the impact and effectiveness of fiscal policy.

⁶⁴ In a low-interest rate environment, the growth rate of interest expenses will be high, even when only small changes in the rate level occur. When the interest rate rises from, for example, 2 to 3 per cent, it means a 50-per cent increase in interest expenses. If incomes don't rise by 50 per cent as well, the debt service ratio will increase. The income growth needed to keep the debt service ratio constant is much lower if interest rates were to rise from 5 to 6 per cent that is a 20-per cent increase in interest expenses.

⁶⁵ Is activity in the Swedish economy too high? Article in *Monetary Policy Report* October 2017. Sveriges Riksbank.

⁶⁶ Se Flodén, M., Kilström, M., Sigurdsson, J., och Vestman, R. (2017), Household debt and monetary policy: revealing the cash-flow channel. *Riksbank Working Paper* No. 342, September 2017. Sveriges Riksbank.

⁶⁷ Finocchiaro, D., Jonsson, M., Nilsson, C. and Strid, I. (2016), Socioeconomic effects of reducing household indebtedness. *Economic Review*, 2016:2. Sveriges Riksbank.

ARTICLE – Short-term liquidity risks in the major Swedish banks

One of the Riksbank's tasks is, where necessary, to provide liquidity assistance to the banking system in the event of a crisis. This liquidity provision should be regarded as a last resort and it is therefore important that the banks first and foremost manage their own liquidity risks. Banks are exposed to various types of liquidity risk. To measure and control these risks, the Basel Committee has produced two measures: The LCR (Liquidity coverage ratio) and the NSFR (Net stable funding ratio). The Riksbank has previously pointed out that the measures do not cover all of the liquidity risks and that the major Swedish banks must therefore continue to reduce their risks, even though they currently meet the requirements for the LCR and report relatively high levels for the NSFR. This article discusses the banks' short-term liquidity risks, based on both LCRs and a stress test carried out by the Riksbank. The Riksbank's test shows that in a stressed scenario lasting more than 30 days, the banks would risk experiencing a significant liquidity need. This article illustrates the importance of measuring liquidity risks in different ways to increase transparency regarding risk-taking by the banks.

The banks' maturity transformation give rise to liquidity risks

A central component of a bank's operations is borrowing money at short-term maturities and then lending it at longer maturities.⁶⁸ This maturity transformation is beneficial to society in that the customers who deposit money in the bank have immediate access to their funds and those who borrow from the bank do not risk needing to pay back the loan before it matures. At the same time, the maturity transformation means that the bank is taking a liquidity risk. The transformation means that the bank's financing must normally be repaid before the bank has received in return the money that it has lent. The bank must therefore renew its financing several times during the course of a bank loan. If the bank's ability to pay is questioned, it may be forced to renew the financing at a higher price, or it may get into a situation where it cannot succeed in renewing its financing at all. The bank then risks becoming illiquid and ultimately being forced to call in loans for payment.

Important that the banks insure themselves against liquidity risk

To reduce the risk that the banks will have problems with their financing, it is important that they do not allow their maturity transformation, and thereby liquidity risk, to become too large. The banks thus need to insure themselves against overly large liquidity risks.

When the banks manage their liquidity risks, they focus primarily on their own operations. However, the banks' total operations can add risks to the financial system as a whole, what are known as systemic risks, which the individual bank does not normally take into account in its risk management.⁶⁹ Thus, the individual bank probably underestimates the total risk for the financial system in its liquidity management.

In addition, central banks, in their role as lender of last resort, can supply liquidity to banks in distress. Although this function is important for financial stability, it entails a moral hazard problem, as systemically-important banks,⁷⁰ with the awareness that they can obtain help from central banks in a crisis, may take larger risks than they would otherwise have done.⁷¹

If the banks do not insure themselves sufficiently against systemic risk, the probability that the central bank will need to provide liquidity assistance increases, which means that the central bank is subjected to credit risk. This means that the banks' liquidity risks could ultimately lead to costs that have to be covered by taxpayers. Too little insurance can also lead to the banks failing to price liquidity risks correctly when lending money. This leads to the general public being able to take out cheaper loans, which increases the demand for loans and risks building up further systemic risk.⁷²

The Riksbank has previously noted that the major Swedish banks do not insure themselves against liquidity

⁶⁸ Segura, A. and Suarez, J. (2016), How excessive is banks' maturity transformation? *Working Paper Series* No 3. European Systemic Risk Board.

⁶⁹ Farhi, E. and Tirole, J. (2012), Collective Moral Hazard, Maturity mismatch, and Systemic bailouts, *American Economic Review*, Vol. 102.

⁷⁰ A systemically-important bank is a bank that, if it suffers problems, could threaten the stability of the financial system.

⁷¹ Korinek, A. (2011), Systemic risk taking, amplification effects, externalities, and regulatory responses. *Working paper series*, No 1345. European Central Bank.

⁷² Acharya, V. and Naqvi, H. (2012), The Seeds of a Crisis: A Theory of Bank Liquidity and Risk-Taking over the Business Cycle. *Journal of Financial Economics*, Volume 106, Issue 2.

risk to an adequate extent. There is thus reason to regulate the banks' liquidity risks.

Current liquidity regulation

There are two measures in the Basel III Accord that measure liquidity risks in banks. One is the LCR (Liquidity Coverage Ratio) that measures the banks' resilience to a short-term stress that lasts 30 days.⁷³ The other measure, NSFR (Net Stable Funding Ratio) provides a picture of how large a share of stable funding (wholesale funding with a maturity of more than one year or other stable funding) the banks use to finance their long-term lending.

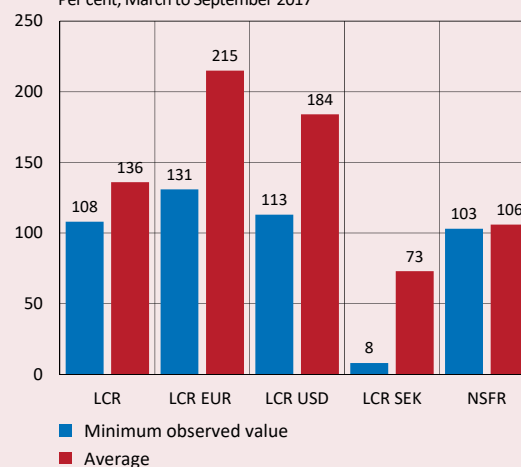
As of 2013, Swedish banks must meet FI's minimum requirement of 100 per cent in LCR for EUR, USD and for all currencies taken together. At present there is no corresponding LCR requirement for other significant currencies including SEK. The NSFR has not yet begun to apply, but will be implemented when the ongoing EU negotiations on this issue are complete. As of January 2018, an EU-wide LCR requirement will also be implemented to replace FI's current requirement.⁷⁴ The major Swedish banks currently meet the 100 per cent requirement for both the LCR and the NSFR (see Chart C1).⁷⁵ At first glance, it may thus appear that the major banks' liquidity risks are limited.

The Riksbank has earlier pointed to deficiencies in current liquidity regulation

However, the LCR and the NSFR do not capture all liquidity risks.⁷⁶ Although the major banks manage the LCR in total and show relatively high levels for EUR and USD, there can be liquidity risks in other individual currencies. The Riksbank has earlier pointed to the need for supplementary liquidity requirements for LCR in SEK and other significant currencies (in addition to EUR and USD).⁷⁷ Even if the banks meet the LCR requirement at a total level, this is not a guarantee that they would be able to manage large outflows in these individual currencies. As there is no LCR requirement in SEK and other significant currencies, the major banks have at times had very small liquidity buffers in these currencies (see Chart C1). In certain cases, the buffers have been so small that for some banks they have been insufficient to cope with one week's stressed liquidity outflows in accordance with the LCR.

Chart C1. The major banks' LCR and NSFR

Per cent, March to September 2017



Note. Refers to daily observations for LCR and monthly for NSFR.

Source: The Riksbank

The Basel regulations do not capture short-term liquidity risks beyond 30 days

The LCR is based on the banks having to hold a liquidity reserve to be able to manage the outflows expected to arise in a stressed scenario that lasts 30 days. These outflows arise when short-term market funding cannot be renewed and when a certain part of the deposits are withdrawn from the banks. The outflows are counteracted to some extent by inflows in the form of short-term loans to financial counterparts that expire and are not renewed. However, the LCR does not describe how a bank would manage stress that lasts longer than 30 days. If the bank has a liquidity reserve that is adapted to manage a stress for 30 days, but the stress turns out to last longer, there is a risk that the bank would have a liquidity need (see Figure C1). The financial crisis, in particular, demonstrated that a period of liquidity stress can be long, when the Riksbank had to provide liquidity in USD to the banking system through the autumn of 2008 and just over one year thereafter. In the first three months alone, the banking system borrowed USD from the Riksbank at several auctions in an amount corresponding to about SEK 200 billion.

As the LCR also only measures resilience in one of several possible stressed scenarios, an approved LCR level does not provide any guarantee for a bank in practice being able to manage 30 days liquidity stress.

⁷³ Basel III: *The Liquidity Coverage Ratio and liquidity risk monitoring tools*, January 2013. Bank for International Settlements (BIS).

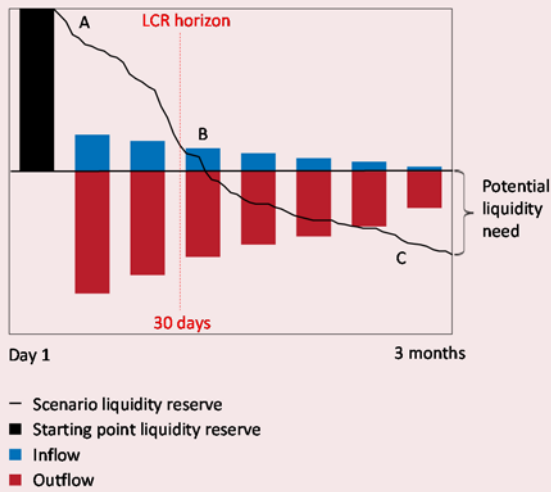
⁷⁴ The EU's current proposal on Delegated Act only covers LCR requirements for all currencies taken together. With effect from 2018, Finansinspektionen's regulations on LCR will cease to apply. It follows on from this that potential liquidity requirements in individual currencies must be introduced from the turn of the year as so-called Pillar 2 requirements.

⁷⁵ NSFR according to the definition in Basel III.

⁷⁶ Roszbach, K. et al. (2016), *The major Swedish banks' structural liquidity risks*, Riksbank Studies. Sveriges Riksbank

⁷⁷ Short-term liquidity risks in significant currencies. Article in *Financial Stability Report 2016:2*. Sveriges Riksbank.

Figure C1. A stylised example of a liquidity scenario



Note. The figure only shows a stylised example and proportions of in and outflow, for example, are not exact.

Figure C1 shows a stylised example of a bank subjected to liquidity stress. At time point A, that is before the stress scenario begins, the bank has the whole of its liquidity reserve intact. At time point B, large net outflows⁷⁸ have meant that the liquidity reserve is down at zero. In practice, however, it is likely that the bank would have problems and need to apply for liquidity support from the central bank before all of its liquidity is gone, that is, sometime between A and B. An example of how large the liquidity need, and thus the potential central bank support, might be after three months is illustrated by time point C in the stress scenario.

LCR and the risks in the Swedish banks' short-term market funding

To assess the liquidity risks in the banks, it is important to have a clear idea of liquidity reserves, lending, deposits and market funding. The maturities of the various assets and liabilities are also important.

Half of the major Swedish banks' funding consists of market funding, corresponding to just over SEK 4,000 billion. Just over SEK 1,000 billion of this funding matures continuously over the next six months (see Chart C2). However, the LCR calculation only captures the part of the market funding that falls due within 30 days. This means

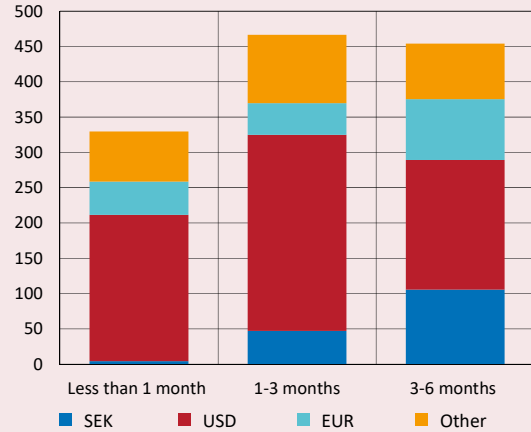
⁷⁸ Net outflows refers to the bank's outflows minus its inflows.

⁷⁹ The Riksbank's stress test uses detailed supervisory data for the banks' assets and liabilities divided by contractual maturity. Together with certain assumptions, this data forms the basis for the banks' in and outflows as used in the Riksbank's stress test. In addition to the length of the stress scenario, there are other differences between the LCR and the Riksbank's stress test. Only central bank investments and government bonds are assumed to be usable as a liquidity reserve in the Riksbank's test but, in the LCR, the liquidity reserve may also consist, to a certain extent, of covered bonds. In addition, the Riksbank's test assumes that the banks' existing lending to the general public is regularly renewed, while lending in the LCR is assumed to generate inflows upon maturity. Five per cent of total deposits from

that maturities after 30 days is not included in the stress scenario on which the LCR measurement is based.

Chart C2. The major banks' short-term market funding per currency and remaining maturity

SEK billion, September 2017



Source: The Riksbank

Stress test shows large outflows in lasting financial stress

Table C1 shows the major Swedish banks' liquidity positions according to the stress scenario in LCR that last 30 days and according to an alternative stress scenario that the Riksbank has designed and which covers 90 days.⁷⁹ Both stress scenarios cover the banks' assets and liabilities in all currencies converted into SEK.

In the Riksbank's stress test, the major banks have at the start total liquidity reserves of SEK 2,359 billion. This is somewhat less than in the LCR scenario and is due to stricter assumptions on which securities can be used for the liquidity reserves in the Riksbank's test.⁸⁰ During the first 30 days of the stress, net outflows are somewhat larger in the Riksbank's stress test than in the LCR scenario, which is mainly because the banks are assumed to renew all existing lending to the general public in the Riksbank's scenario, which is to say that no tightening of lending occurs. The LCR scenario assumes that half of the lending that matures is repaid to the bank. However, a further difference is that the scenario in LCR lasts for 30 days, while the Riksbank's stress test continues a further two months. The further outflows during these two months consist mostly of the banks' short-term market funding which falls due over a period of one to three months (see Chart C2). In the LCR scenario, the major

households is assumed to disappear over the Riksbank's three-month scenario, while the LCR assumes that five to ten per cent of deposits from households is withdrawn over a month. In addition, the Riksbank's scenario assumes that 25 per cent of total deposits from non-financial corporations disappears, while the LCR assumes there will be an outflow of between five and 40 per cent, depending on the type of exposure. The banks' wholesale funding is assumed to be impossible to renew, both in the LCR and the Riksbank's scenario. See *Consultation response to the proposal referred to the Council on Legislation regarding the Riksbank's financial independence and balance sheet*, April 2017. Sveriges Riksbank.

⁸⁰ This depends on the handling of covered bonds - see the previous footnote.

banks have a liquidity surplus of SEK 625 billion after 30 days when the scenario ends. In the Riksbank's scenario, which lasts for 90 days, the banks have a deficit or a liquidity requirement of SEK 586 billion. This amount covers all currencies but the major part of the requirement is in foreign currencies. One of the assumptions in this scenario is that the banks have the possibility to switch between currencies via the currency swap market. However, in a stressed situation it is not certain that this will be possible. This means that a liquidity problem can arise in individual currencies, which are not included in the scenario, which would in that case worsen the situation for the banks and the aggregate liquidity need would increase.

The Riksbank's stress test thus shows that large outflows can occur beyond 30 days of lasting stress. The calculations that form the base for the Riksbank's stress test can of course be done in different ways, however, and the Riksbank's scenario is just one of several possible ones.

Table C1. Liquidity positions at different points in time in the Riksbank's stress scenario and the LCR's stress scenario

SEK billion, June 2017

Stress scenario in LCR	
Liquidity position at start	2,754
Net outflows 30 days	2,129
Liquidity position after 30 days	625
The Riksbank's stress scenario	
Liquidity position at start	2,359
Net outflows 30 days	2,361
Liquidity position after 30 days	- 2
Further net outflows after 30 days	584
Liquidity position after 90 days	- 586

Note. The table shows the major banks' liquidity reserves and net outflows in total for all currencies converted to SEK.

Source: The Riksbank

Supplementary liquidity measures can give a more complete picture of the banks' liquidity risks

This article illustrates the fact that the major Swedish banks take short-term liquidity risks that are not fully captured in the LCR. The fact that the banks attain the minimum requirement for the LCR does not say very much about how they would cope with stress that lasts more than 30 days.

The Riksbank's stress test shows large potential liquidity needs for the major Swedish banks in a stress situation that lasts for 90 days. Even if the scenario in the Riksbank's stress test is only one of several possible ones, it shows the importance of measuring short-term liquidity risk in different ways as a complement to the LCR.

The IMF highlighted in 2016 the need to measure short-term liquidity risk in the major Swedish banks in

different ways.⁸¹ The IMF recommended that the banks be supervised with a supplementary measure corresponding to the LCR, but for stress lasting three months. The Riksbank shares the assessment that it is important to measure and supervise the banks' short-term liquidity risks according to different measures, in addition to the LCR. This would increase the transparency of their liquidity risks.

⁸¹ Sweden, *Financial stability assessment*, November 2016. International monetary fund (IMF).

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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PRODUCTION SVERIGES RIKSBANK
ISSN 1404 – 2207 (print)
ISSN 1654 – 594X (online)