

Financial Stability Report

2017:1



The Riksbank's Financial Stability Report

The Riksbank's Financial Stability Report is published twice a year. In the report, the Executive Board of the Riksbank gives an overall assessment of the vulnerabilities and risks that can threaten the stability of the financial system and evaluates the system's resilience to them. In some cases the Executive Board recommends specific measures to counteract risks and increase resilience. These recommendations may be based on the current economic situation, but they may also relate to more structural circumstances. The recommendations can be aimed at banks as well as at other market participants, or at legislators and other authorities.

The Executive Board of the Riksbank discussed the report on two occasions – on 11 and 22 May 2017. The report takes into account developments up to and including 15 May 2017. The report can be downloaded in PDF format from the Riksbank's website, www.riksbank.se, where more information about the Riksbank can also be found.

The Riksbank and financial stability

- The Riksbank defines financial stability as the financial system being able to maintain its three basic functions – the mediation of payments, the conversion of savings into funding and risk management – as well as being resilient to shocks that threaten these functions.
- 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 Riksbank has a mandate from the Riksdag (the Swedish parliament) to promote a safe and efficient payment system. In practice, this task means that the Riksbank is responsible for promoting financial stability.
- 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 a good way the Riksbank needs to be well prepared for crises by having an efficient crisis organisation.
- The Riksbank shares responsibility for promoting financial stability with FI (the Swedish Financial Supervisory Authority), the Ministry of Finance and the Swedish National Debt Office. The Ministry of Finance is responsible for regulating financial undertaking corporations. FI is responsible for microprudential policy and has the main responsibility for macroprudential policy. The Swedish National Debt Office is, in turn, a support and resolution authority. Interaction between the authorities is important both in preventive work, for example in the Financial Stability Council, and in the event of crisis management. The same also applies internationally, as financial enterprises increasingly operate across national borders.
- The Riksbank analyses the financial system's stability on a continuous basis for the early detection of risks and vulnerabilities that could lead to socioeconomic costs. The Riksbank publishes the results of its analysis in various publications. By doing this, the Riksbank not only brings attention to and warns against things that may pose a threat to the financial system but also contributes to the debate on this subject.

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SUMMARY

Households' high and rising indebtedness continues to form a serious threat to financial and macroeconomic stability. Further measures need to be introduced to increase the resilience of the household sector and reduce risks. The Riksbank also assesses that there are still vulnerabilities making the Swedish financial system and the Swedish economy sensitive to shocks. The resilience of the Swedish banking system therefore needs to be strengthened. This applies to both the banks' capital levels and their ability to manage liquidity risks. Sweden has a large and cross-border banking sector with significant commitments in foreign currency. It is important that the banks themselves have a good capacity to manage the liquidity risks they take in their operations. At the same time, it is necessary that the Riksbank has a sufficiently large foreign currency reserve if liquidity requirements should arise in foreign currency that the banks themselves are unable to.

Good economic outlook and stable financial markets but risk of setbacks

The economic recovery abroad is continuing and includes an increasing number of countries, and developments on the international financial markets are relatively stable. Swedish economic activity is also strengthening, and is expected to strengthen further. However, there is still a considerable risk of setbacks, as there is significant political and economic uncertainty in several parts of the world. 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 poses risks to Swedish financial stability.

Housing price developments and household indebtedness – the foremost risk

In 2016 and at the beginning of 2017, the rate of increase in housing prices and mortgages slowed slightly. But household indebtedness and housing prices are still rising and are expected to continue to do so in the period ahead. The Riksbank therefore continues to see rapidly increasing housing prices and the high and rising indebtedness of Swedish households as posing major risks for the Swedish economy. This assessment is shared by international bodies such as the International Monetary Fund (IMF), Organisation for Economic Co-operation and Development (OECD), European Commission and the European Systemic Risk Board (ESRB).

It is therefore important to continue with measures to increase resilience in the household sector and reduce the risks. Both measures to achieve a better balance between supply and demand on the housing market and tax reforms

to reduce the willingness or ability of households to take on debt are required. Further macroprudential policy measures also need to be taken. The amortisation requirement introduced on 1 July 2016 is a step in the right direction, but further measures are needed.

Vulnerabilities and risks in the Swedish banking system

As before, the Riksbank sees considerable vulnerabilities and risks in the Swedish banking system. The vulnerabilities are linked to the size of the Swedish banking system, its concentration and interconnectedness. The banks' large proportion of wholesale funding and their substantial exposure to the housing sector are of significance in the context. Added to this are the banks' limited capital and resilience to liquidity risks, which are further contributing to the financial system's sensitivity to shocks.

A higher leverage ratio requirement than 5 per cent may be appropriate

This means that it is important that the major banks have sufficient capital. Although Finansinspektionen (FI) has already taken measures to increase capital requirements, it is the Riksbank's assessment that the resilience of the Swedish banking system needs to be further strengthened. The Riksbank therefore considers that a higher leverage ratio requirement than the proposed minimum level of 3 per cent shall be imposed on the major Swedish banks in EU's so-called banking reform package¹. According to the Riksbank, FI should introduce a leverage ratio requirement of 5 per cent for the major Swedish banks as of January 2018, as a complement to the risk-weighted capital requirements. New calculations also indicate that a higher requirement than 5 per cent may be socio-economically

¹ See fact box on page 22.

profitable.² It may therefore prove appropriate to further increase the requirement in the period ahead.

Important for the banks to have self-insurance

Liquidity risks arise partly as a result of Sweden having a large, cross-border banking sector with significant commitments in foreign currency. Weak resilience among Swedish banks to liquidity stress in foreign currency can pose significant risks to financial stability. The Riksbank therefore wishes to stress the importance of banks having their own self-insurance by, for example, holding adequate liquidity reserves so that they have a good capacity to themselves manage the liquidity risks they take in their operations. The Riksbank is therefore of the opinion that FI should set Liquidity Coverage Ratios (LCR) requirements for Swedish banks in all significant currencies.

Important to have a foreign currency reserve that is not below its current level

It is also important for Swedish authorities to be able to manage a situation of financial stress in which there may be liquidity requirements in foreign currency that the banks themselves cannot handle. The Riksbank holds a currency reserve to be able to satisfy such a need. The potential need for liquidity that banks currently have, suggest that the currency reserve should not be below its current level. The alternative, to rapidly acquire the foreign currency needed once a crisis has materialised or is imminent can be very expensive, difficult or even impossible. There is also a risk that the probability of suffering a crisis increases, as resilience and confidence abroad will become lower.

The vulnerability of the Swedish financial system may entail significant risks for financial stability and for the economy as a whole in our neighbouring countries, in which Swedish banks have operations, which the Baltic and Nordic central banks have pointed out. Moreover, Nordea's transformation into a branch structure means that Swedish actors' short-term funding in foreign currency is doubled. Further, the Ministry of Finance has presented a draft referral to the Council on Legislation regarding the Riksbank's financial independence. In the short term, the proposal will have the effect of rapidly and significantly reducing the foreign currency reserve. In addition, the proposal will limit the Riksbank's scope for borrowing from the Swedish National Debt Office.³ It is reasonable for the Riksbank not to have the right to unlimitedly and unilaterally decide on borrowing from the Swedish National Debt Office. The current arrangements, which mean that the Swedish National Debt Office must, within its mandate, make a government debt policy trade-off prior to a decision

on borrowing to the Riksbank, should be clarified in the legislative text. However, the Riksbank has the possibility to fund the foreign currency reserve in its own name. It is nevertheless more cost-effective for the Swedish National Debt Office to continue borrowing on behalf of the Riksbank (see article "A cross-border banking sector with major assets and liabilities in foreign currency poses risks to financial stability").

Articles about commercial property companies and FinTech

The report also contains an article about commercial property companies. The sector is large, highly cyclical and the companies have a large share of borrowed capital. Moreover, the major Swedish banks have substantial exposures towards the sector, for instance, via bank loans. In recent years, prices of commercial property have risen rapidly, partly as a result of strong economic activity and low interest rates. The commercial property companies have increased their debts apace with this. The price growth can largely be explained by fundamental factors, but the assessment is that there may be risks as these factors can quickly change (see article "Commercial properties and financial stability").

The report also contains an article on FinTech. New technique poses certain challenges to financial stability despite it also being positive for the development of the financial sector (see article "FinTech – increasingly rapid interaction between financial operations and technological innovation").

² Suitable capital ratios in major Swedish banks – new perspectives, *Staff Memo*, May 2017. Sveriges Riksbank.

³ Draft proposal *The Riksbank's financial independence and balance sheet*, March 2017. Ministry of Finance.

CHAPTER 1 — The current economic and financial situation

The international economic recovery is continuing at a moderate pace and includes an increasing number of countries. Since November, stock prices have continued to rise around the world. The financial markets have otherwise had a relatively stable development. Swedish economic activity is good and is expected to strengthen further during the period ahead. The major Swedish banks are also continuing to report good profitability. Concern remains over the state of the European banking sector.

Economic recovery and rising stock prices

The international economic recovery is continuing at a moderate pace and includes an increasing number of countries. Since the end of November, when the last Financial Stability Report was published, economic activity in Sweden has developed slightly better than expected and is expected to strengthen further in the period ahead.⁴ Forward-looking global and Swedish indicators are continuing to strengthen and point to rising optimism in the household and corporate sectors.

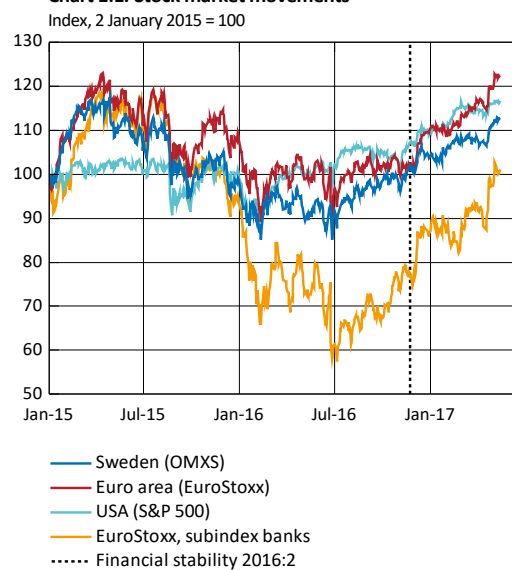
Since November, stock prices have continued to rise around the world (see chart 1:1).⁵ This development can be linked not only to the economic recovery but also to expectations of fiscal policy stimulation in the United States. Although European bank equity prices, together with bank equity prices elsewhere, have risen over the period and unease remains over the state of the European banking sector (see fact box on page 9). The financial markets have otherwise had a relatively stable development since the end of November.

The Riksbank's stress index rose in connection with the increased volatility on the Swedish interbank market at the start of the year, but has subsequently fallen to lower levels than at the end of November and the average since 2007 (see chart 1:2). However, this index primarily measures stress on the financial markets and does not take directly into account the fact that risks can build up in the financial system (see chapter 2).

The Federal Reserve has started to raise its policy rate

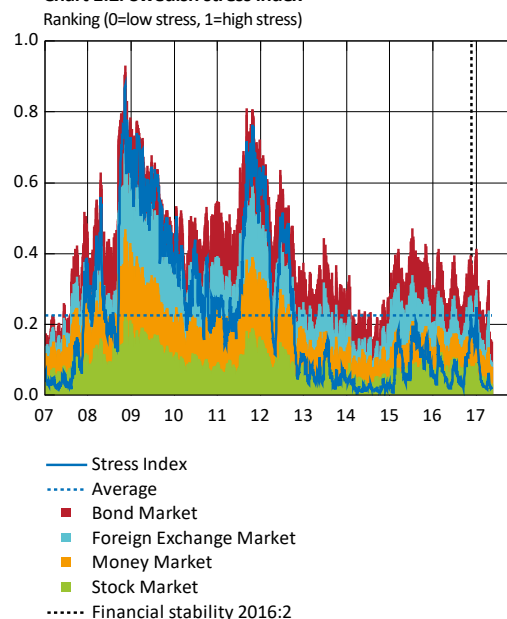
The world's larger central banks are still conducting an expansionary monetary policy, but in the United States, the Federal Reserve has started to raise the interval for its policy rate. Since the end of November, the interval has been raised on two occasions by 0.25 percentage points, to the current interval of 0.75–1.0 per cent. Expectations that the US policy rate will be raised further in 2017 have increased since

Chart 1:1. Stock market movements



Sources: Macrobond and Thomson Reuters

Chart 1:2. Swedish stress index



Note. The Swedish stress index has been produced by the Riksbank using a method similar to that used by the ECB for the European stress index. See Johansson, Tor and Bonthron, Fredrik (2013), Further development of the index for financial stress in Sweden, Sveriges Riksbank Economic Review 2013:1. Sveriges Riksbank.

Sources: Bloomberg and the Riksbank

⁴ *Monetary Policy Report*, April 2017. Sveriges Riksbank.

⁵ See separate Annex for additional charts on developments in the financial markets as well as the situation in the major Swedish banks and among the banks' borrowers. (www.riksbank.se).

November and now indicate at least one more rate hike over the year. Over the same period, both the European Central Bank (ECB) and the Riksbank have presented further easing. In December 2016, the ECB decided on measures including an extension of its programme for asset purchases until the end of December 2017, and the Riksbank decided to extend purchases of government bonds over the first six months of 2017. In April, the Riksbank decided also to extend purchases in the second half of 2017.

Continued high credit growth among households and companies

Credit growth among households and companies continues to be high (see chart 1:3). In 2016, growth in bank loans to households slowed slightly and was 7.3 per cent in March. This weak slowdown is linked to the fall in the growth rate for loans with tenant-owned apartments as collateral (see chart 1:4). At the same time, the growth rate for consumer loans has increased from around 2 per cent to just over 7 per cent. Loans for consumption only constitute a small share of total household debt, however, while tenant-owned apartments make up a much larger share.

In March, the annual growth rate in lending to companies was 5.3 per cent. A number of larger companies are issuing corporate bonds and certificates. So far this year, the average rate of increase for this borrowing has been 7.6 per cent on an annual basis, compared with 6.5 per cent on average over 2016. Surveys confirm that companies' funding conditions continue to be good.

Swedish banks' lending is hence expected to continue to grow in the years ahead, which is a consequence of improved real economic prospects for Sweden and abroad. Lending is also being stimulated by the very low interest rates offered to households and companies.

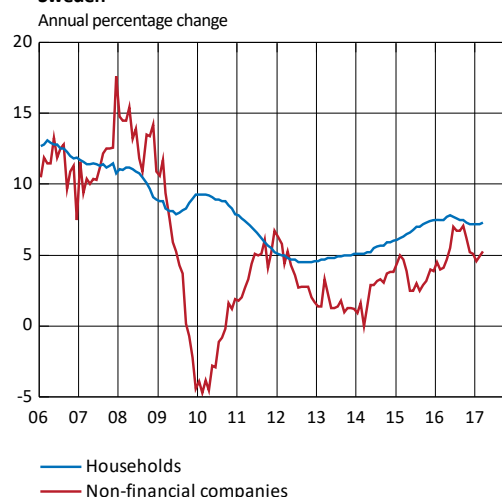
Housing prices are continuing to rise rapidly but the rate of growth has stabilised slightly since November, even if there are large regional differences. In April, housing prices rose by an annual rate of 8.1 per cent. This can be compared with growth rates as high as 15–20 per cent in 2015. At the same time as price increases have slowed down slightly, surveys indicate continued optimism among the general public and estate agents, and a belief that housing prices will rise going forward.

Still good profitability in the major Swedish banks

The major Swedish banks have continued to report high profitability compared with other European banks (see chart 1:5). The banks' average deposit rates for households and companies have remained largely unchanged around zero per cent since mid-2015, despite the increasingly expansionary monetary policy and the negative repo rate.⁶ And this has

⁶ At present, neither households nor most companies have negative interest rates on their deposits. On the other hand, there are some larger corporations and some municipalities

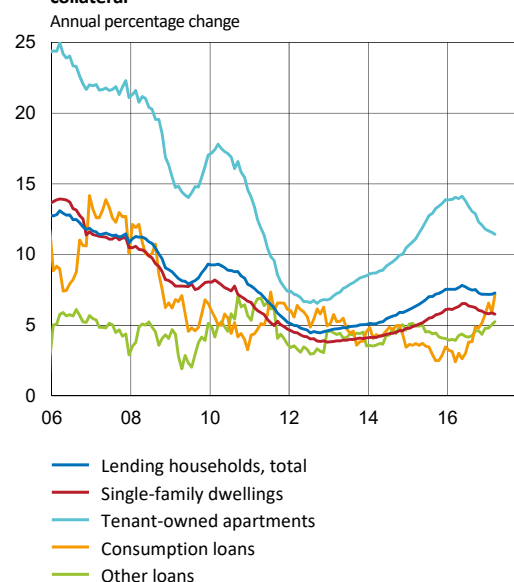
Chart 1:3. Loans to households and non-financial companies in Sweden



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

Source: Statistics Sweden

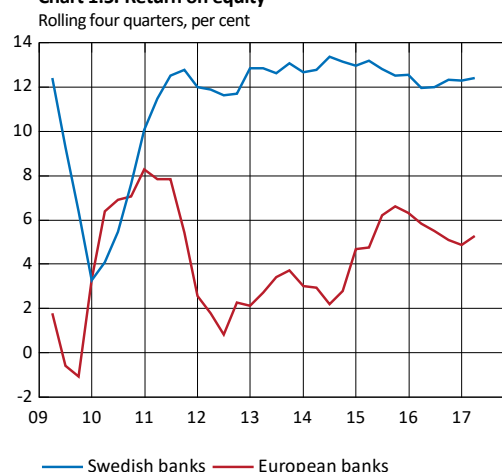
Chart 1:4. Growth of household loans, broken down by collateral



Note. Annual growth rate, for household lending, totally, consumer loans and other loans, has been adjusted for reclassifications and bought and sold loans.

Source: Statistics Sweden

Chart 1:5. Return on equity



Note. Unweighted average. The red line represents a sample of European banks, see footnote 2 in *Financial Stability 2016:2*.

Sources: SNL Financial and the Riksbank

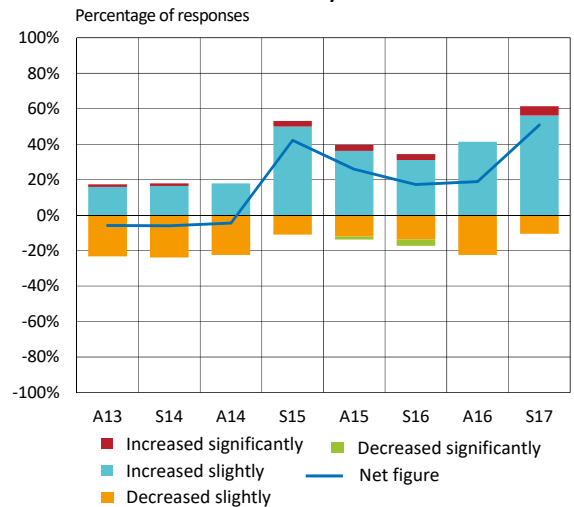
made funding via deposits relatively more expensive for the banks and has pushed down their profitability slightly. But by measures such as higher lending margins on mortgages, the banks have managed to retain their high profitability. Profitability also depends on the continued good debt-servicing ability of the major banks' borrowers, which makes loan credit losses small. In addition, the Swedish banks are more cost-efficient than many other banks in the world. This has helped the major Swedish banks to continue to report good profits. It has also been possible to maintain the results with the help of revenue from other operational areas, such as asset management and advice, and a relatively high credit growth, especially with housing and property as collateral.

Market participants are experiencing a higher risk level in the Swedish financial system

Among the market participants who responded to the Riksbank's risk survey during the spring, opinion is divided on the overall risk level in the Swedish financial system.⁷ Three out of five participants consider that the risk level has increased over the last six months (see chart 1:6). Several participants consider that this is due to the low level of interest rates and households' high indebtedness. The participants also mention unease over what may happen to various asset prices when interest rates are eventually raised.

The survey also makes clear that opinions differ among the participants as regards how the Swedish financial markets are functioning. The majority of the participants consider that the markets are functioning in the same way as they did six months ago, while one-third consider that they are functioning slightly worse. According to the participants, this is primarily because they consider that market liquidity on the bond market has deteriorated. The Riksbank has previously investigated how market liquidity on the Swedish bond market has developed since the financial crisis.⁸ Different indicators provided a divided view of developments and it was therefore difficult to draw any unequivocal conclusions about how market liquidity had changed. Since then, the various indicators have not moved in any clear direction, see, for example, the ratio of turnover to outstanding volume (see chart 1:7). The Riksbank's previous assessment that the Swedish bond markets seem to be functioning relatively well is thus still valid. The Swedish National Debt Office, which has a good insight into the functioning of the market, also

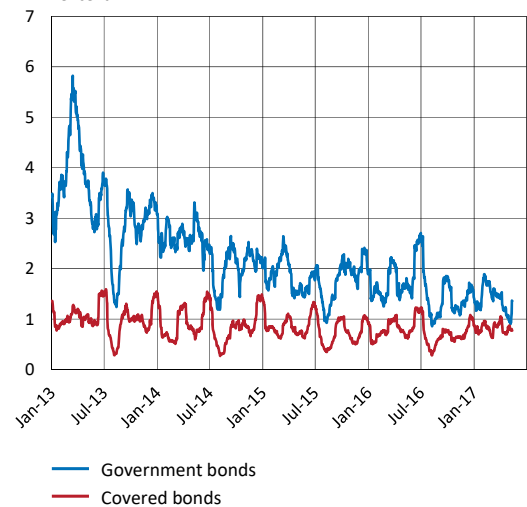
Chart 1:6. Market participants' perception of the total risk level in the Swedish financial system



Note. The participants have responded to the question "What is your perception of the way the total risk level in the Swedish financial system has developed in the past six months?". The category "Neither better nor worse" is not shown in this chart. Net figure shows the difference between the columns above and below zero.

Source: *Market participants' views on risks and the functioning of the Swedish fixed-income and foreign exchange markets, May 2017*. Sveriges Riksbank.

Chart 1:7. Bond turnover relative to outstanding volume



Note. Refers to turnover in one day in relation to stock.

Sources: Macrobond, the Swedish National Debt Office and the Riksbank

who have to pay for their bank deposits. However, these companies and municipalities can often in turn borrow money at a negative interest rate, which means they are better equipped to manage bank deposits at a negative interest rate than smaller companies. At present, around 13 per cent of the deposits from non-financial corporations are at negative interest rates. So only a relatively small share of deposits are covered.

⁷ *Market participants' views on risks and the functioning of the Swedish fixed-income and foreign exchange markets, May 2017*. Sveriges Riksbank. The spring survey was sent out to 71 participants active in the Swedish fixed-income and foreign exchange markets. The response rate was 80 per cent.

⁸ Market liquidity on the Swedish bond market and its importance for financial stability. Article in *Financial Stability Report 2016:1*. Sveriges Riksbank.

assesses that it is functioning in a satisfactory manner.⁹

Therefore, the risks to financial stability in Sweden linked to market liquidity are not deemed to have increased at present and market functioning does not appear to have significantly deteriorated. The development of the financial markets can change rapidly, however, and it is therefore important to keep track of how they are functioning.

⁹ *Central government borrowing: Forecast and analysis 2017:1*. Swedish National Debt Office.

CHAPTER 2 – Vulnerabilities and risks in the financial system

The Riksbank considers that there are still vulnerabilities making the Swedish financial system and the Swedish economy sensitive to shocks. These are primarily linked to high household indebtedness. But there are also vulnerabilities linked to the Swedish banking system's structure as well as to banks' limited capital and resilience to liquidity risks. Current risks include political and economic uncertainty abroad and the low interest rate environment.

There are several different vulnerabilities and risks that may threaten the Swedish financial system and the Swedish economy. For a long time, the vulnerabilities and risks have primarily been linked to the high indebtedness of Swedish households. In addition to their own bank loans, many households are also indirectly indebted via loans taken out by tenant-owned associations. They can thus be affected both by interest rate rises on their own loans and by higher monthly fees as a result of increased interest expenses on loans taken out by the association.

Several risks are also created by the low interest rate environment and by the continued uncertainty regarding political and economic developments abroad. For instance, an environment with low interest rates can mean that financial market participants take increasingly large risks in their search for yield and that assets risk being overvalued. These risks can, in turn, lead to shocks in the Swedish banking system, due in part to the banks having a high level of exposure to the housing and real estate markets. There are also vulnerabilities linked to the Swedish banking system's structure, in particular its size, concentration, interconnectedness and large proportion of wholesale funding. The banks' limited capital and resilience to liquidity risks also make the financial system more sensitive to shocks.

Another important prerequisite for financial stability is a stable, safe and efficient financial infrastructure.¹⁰ The Riksbank considers that the systems in the financial infrastructure are still safe and efficient, but that the operative risks have increased. This includes risks of cyberattacks that could result in central financial services becoming unavailable.¹¹ There are also risks linked to Euroclear Sweden's old technical system for securities settlement, which the Riksbank since 2013 has been requesting should be replaced.¹²

Furthermore, new technology poses certain challenges to financial stability despite it also being positive for the

¹⁰ The various infrastructure systems include RIX, Nasdaq Clearing, Bankgirot and Euroclear Sweden.

¹¹ All infrastructure systems monitored by the Riksbank are working actively to strengthen their resilience to cyberattack, in accordance with CPMI-IOSCO's guidelines for cybersecurity.

¹² See *Financial Infrastructure*, March 2016. Sveriges Riksbank.

development of the financial sector (see the article “FinTech – increasingly rapid interaction between financial operations and technological innovation”).

Vulnerabilities and risks associated with international developments

Although economic activity abroad has strengthened at a moderate pace, uncertainty still prevails about political and economic developments, and the risk of setbacks is considerable. 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 poses risks to Swedish financial stability.

Continued political uncertainty

There is considerable political uncertainty in many parts of the world, which entails a risk for setbacks in the economic recovery. In the United States, where there was optimism on the financial markets after the presidential election in November as a result of anticipated fiscal policy stimulation, developments have become more unpredictable. Not only is the extent to which various political proposals will be implemented uncertain, but there is also a risk of increased protectionism.¹⁴

There is also considerable political uncertainty in Europe. Elections are set to take place in several European countries and furthermore, preparations prior to the negotiations between the United Kingdom and the European Union are now under way following the former’s decision to leave the Union. How these negotiations will affect the political climate in Europe is uncertain.¹⁵ Even more uncertain are the economic consequences of the UK’s exit – for both the UK and EU Member States, including Sweden. In addition, uncertainty prevails surrounding the programme negotiations with Greece and how the country is to refund its debts of EUR 6.4 billion that are due in July.

International discussions are also under way regarding future financial regulations and standards. Discussions are taking place both globally (within the Basel Committee) and at the European level (within the EU). It is important to have clear and harmonised financial rules in place even though the current discussions contribute to some uncertainty regarding which rules will apply to banks, both globally and in Sweden. It is important that these discussions lead to adequately strict rules in order to not increase the risk of future crises.

¹³ The main rule is that a government may only inject capital if the shareholders and certain creditors also contribute (a so-called bail-in).

¹⁴ For further analysis of the consequences of increased protectionism, see The economic consequences of increased protectionism. Article in *Monetary Policy Report*, April 2017. Sveriges Riksbank.

¹⁵ The Economic consequences of increased protectionism. Article in *Monetary Policy Report*, April 2017. Sveriges Riksbank, and The result of the United Kingdom referendum on the EU creates uncertainty. Article in *Monetary Policy Report*, July 2016. Sveriges Riksbank.

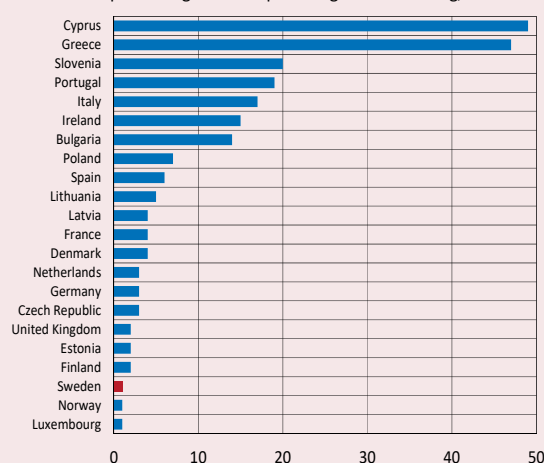
Continued challenges in the European banking sector

Since the financial crisis, many banks in the euro area have been weighed down by structural problems. Several of these banks have also had poor profitability and a large proportion of non-performing loans on their balance sheets (see chart 2:1). These loans may lead to credit losses, negatively affecting the banks’ equity. The loans also generate limited revenues, at the same time as they are charged to the bank’s balance sheet and require capital adequacy. This means that the banks have fewer possibilities to provide loans for new investments. This, in turn, has dampened economic growth in several euro area countries.

The reasons for this weak profitability differ from bank to bank in the various countries. For example, certain banks have problems with low earnings, while other banks have problems with high costs. In addition, a smaller number of banks have also been affected by legal consequences, in the form of fines, related to the sale of mortgage bonds prior to the financial crisis.

In Italy, several of the country’s banks have major problems and the Italian government has therefore set up a fund of EUR 20 billion, corresponding to 1.2 per cent of GDP, to manage these. For example, the country’s third largest bank, Monte dei Paschi di Siena (MPS), has had comprehensive problems and discussions are currently in progress on how the bank can be saved. The current proposal is that the Italian government should provide new capital via the fund. Such a capital injection must be compatible with the state aid rules, which is being examined by the European Commission. The Commission has not yet determined the case¹³. The way in which the Commission chooses to manage this case will probably affect the future management of other European banks in distress.

Chart 2:1. Non-performing loans at European banks
Non-performing loans as a percentage of total lending, March 2016



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.

Source: EBA

The international economic outlook remains uncertain

Alongside the political uncertainty, there is also major uncertainty surrounding the international economic recovery.

In Europe, the banking sector is still burdened with structural problems that could impede the economic recovery in Europe even more and thus also the recovery in Sweden (see fact box on page 9). In a very adverse scenario, if for instance investor confidence in the European banking sector declined even further, stress could arise on the financial markets that could lead to more expensive loans and substantial market fluctuations. The scope for fiscal policy to fend off such a shock is limited, however, as central government finances in several European countries remain weak.

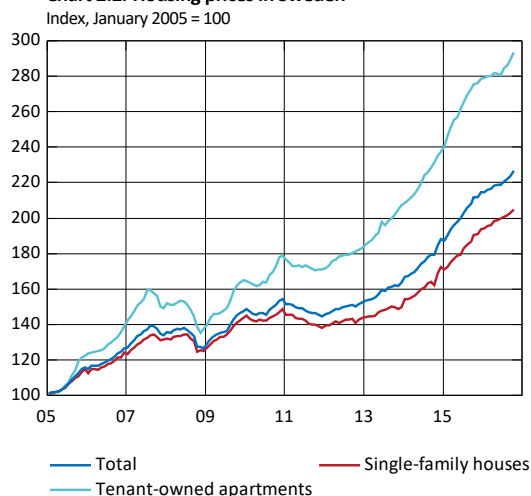
In addition, monetary policy is already very expansionary with policy rates close to or below zero and other measures, such as asset purchases, have also been deployed in many countries.

Economic activity is expected to continue to strengthen in the Nordic and Baltic countries. Similar to other countries, there is although a risk of setbacks linked to both global development and to domestic factors also here. Furthermore, in Norway and Denmark, housing prices are rising rapidly, especially in Oslo and Copenhagen, which can pose a risk. Housing prices are also rising in the Baltic countries, and in Estonia they are back to the same level as before the crisis in 2008. As there is considerable financial integration in the Nordic-Baltic Region, shocks in one of the countries can also spread to Swedish companies and banks. Similarly, this entails a risk to financial stability in the Nordic-Baltic countries if the major Swedish banks have problems (see article “A cross-border banking sector with major assets and liabilities in foreign currency poses risks to financial stability”).

Vulnerabilities and risks associated with low and rising interest rates

Interest rates are low in an historical perspective. One important explanation is that structural factors have increased global saving in relation to investment, thereby driving down the trend in global real interest rates.¹⁶ Moreover, many central banks have conducted an expansionary monetary policy to stimulate economic growth and counteract the risks of too low inflation. But low interest rates for a long period also pose risks that can threaten financial stability.¹⁷

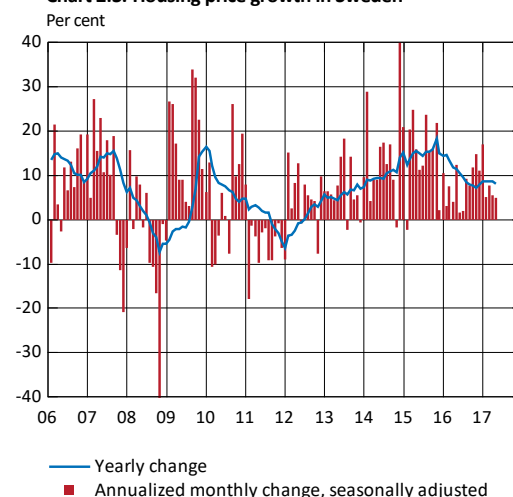
Chart 2:2. Housing prices in Sweden



Note. Seasonally-adjusted housing prices.

Sources: Valueguard and the Riksbank

Chart 2:3. Housing price growth in Sweden



Note. Annual change and monthly change adjusted to annual growth rate.

Sources: Valueguard and the Riksbank

¹⁶ The repo rate in the long run. Article in *Monetary Policy Report*, February 2017. Sveriges Riksbank.

¹⁷ For a study of various aspects of the low interest-rate environment, see Macroprudential policy issues arising from low interest rates and structural changes in the EU financial system, November 2016. European systemic risk board (ESRB) and Gibas, N., Juks, R. and Söderberg, J. (2015), Swedish financial institutes and low interest rates, *Economic Commentary* No. 16, 2015. Sveriges Riksbank.

Housing prices continue to rise

One risk of low interest rates is that they can contribute to overvaluation of prices, of for example housing, shares and other assets. Many asset prices have risen rapidly in recent years and Swedish housing, for example, is now highly valued in a historical perspective.^{18 19} Over the last ten years alone, house prices have doubled and tenant-owned apartment prices have tripled (see chart 2:2). In 2016, the rate of increase in housing prices did slow down, probably because of the expected amortisation requirement, but during the spring 2017, they have started to increase slightly more rapidly again (see chart 2:3).²⁰

Housing prices in metropolitan areas, and especially in Stockholm, have been rising sharply for a long time. But since the autumn of 2016, prices in Stockholm have risen more slowly. In Malmö, on the other hand, prices have risen increasingly rapidly over the last twelve months. This may in part be due to prices in Malmö following the price development in Copenhagen, where the rate of price increase has accelerated after a period of weak development. At the same time, it is possible that the amortisation requirement has had a greater impact on housing prices in Stockholm, where price levels are higher.

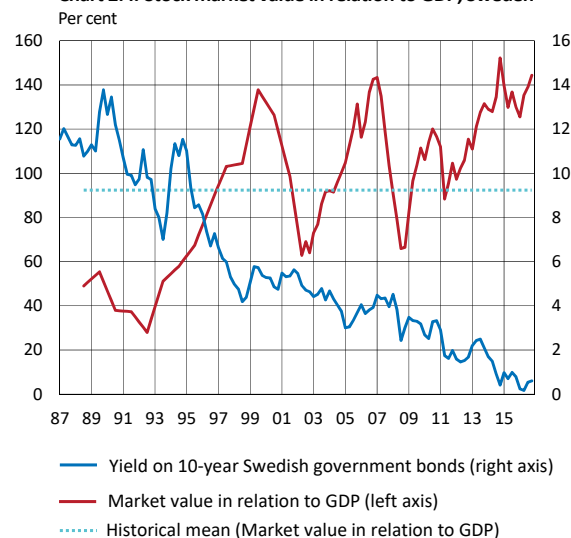
There are several factors that have contributed to the rapid rise in housing prices. It is partly due to structural factors that have limited the supply of housing, and partly due to rising real wages and taxes being cut that has benefited households' disposable incomes. In addition, the low level of interest rates has made it cheaper for households to borrow money to buy a home.

The fact that the price trend can be explained by different factors, however, does not rule out the possibility of a fall in housing prices. Even the factors that have driven the price growth may change, especially if they are not in a state of long-term equilibrium. If, for instance, interest rates in Sweden were to rise sharply, there is a risk that Swedish housing prices might fall. Such a fall could be very substantial and problematic, if households expect interest rates to remain low and don't leave themselves a good enough margin for higher rates when they purchase a home.

Other asset prices have also risen

The low level of interest rates has also contributed to a continued rise in share prices (see chapter 1) and valuations are now at levels similar to those prior to the financial crisis in 2008 and before the IT bubble burst at the beginning of the 2000s (see chart 2:4). The upturn was probably due in part to that the relatively high dividends on certain shares helps

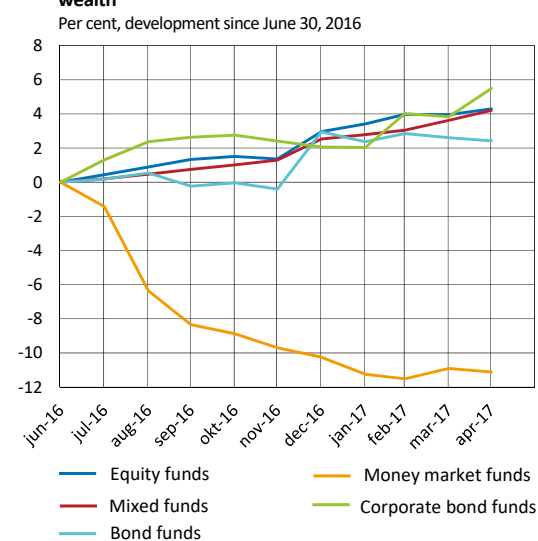
Chart 2:4. Stock market value in relation to GDP, Sweden



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 2:5. Aggregate monthly net flows in relation to fund wealth



Note. The fund flows refer to Swedish investors. Corporate bond funds are excluded from the bond funds.

Source: Swedish Investment Fund Association

¹⁸ Giordani, P., Grodecka, A., Kwan, S., Morales, P., Ölcer, D. and Spector, E. (2015), Asset valuations and financial stability, *Economic Commentaries* No. 15, 2015. Sveriges Riksbank.

¹⁹ Globally, low interest rates have also contributed to rising house prices and higher indebtedness, for instance in Australia, Canada, New Zealand and Norway.

²⁰ The amortisation requirement was introduced on 1 June 2016 but discussions about the introduction have continued for almost two years.

make these attractive investments when interest rates are low. Similar to housing prices, highly valued share prices does not necessarily mean that the prices will fall in the future, but there is an elevated likelihood of them doing so.

The low interest rates have also led to an inflow to riskier funds, such as equity funds and corporate bond funds since the summer of 2016. At the same time, there has been an outflow from Swedish money market funds, which find it difficult to generate return when interest rates are low (see chart 2:5). The inflow into corporate bond funds has coincided with falling risk premiums for Swedish corporate bonds (see chart 2:6). This development can be seen as a sign of “search for yield”. The fall in risk premiums is, however, an international phenomenon.

Low interest rates are making banks more vulnerable

Another risk that may arise if interest rates remain low for a longer period is that banks and insurance companies may want to compensate for lower nominal returns by taking greater risks.²¹ For example, banks could start lending more to higher-risk borrowers, which increases the risk of loan credit losses. Until now, however, there have been no clear signs of such behaviour among the major banks. Banks may also choose to increase their lending volumes, which they have done over the past six months (see chapter 1). Lending has primarily increased for loans with housing and other property as collateral. In other words, banks are even more exposed to the housing market.

Since the start of 2015, the repo rate has been negative. This could lead to banks choosing to introduce negative deposit rates to reduce their funding costs. However doing this could lead to customers withdrawing their money and, for instance, investing in other more risky forms of saving. This part of the banks’ funding would thereby shrink. If the deposits were to be moved at a fast rate and to a great extent, without the banks having an alternative source of funding, this may pose risks to financial stability. For example, individual banks could be exposed to liquidity stress, which could damage confidence in the Swedish banking system. The major banks have chosen to introduce negative rates for just a small proportion of their depositors, mostly non-financial corporations and some municipalities and county councils.²² At present, around 13 per cent of the deposits from non-financial corporations are at negative interest rates.

Low interest rates make insurance companies more vulnerable

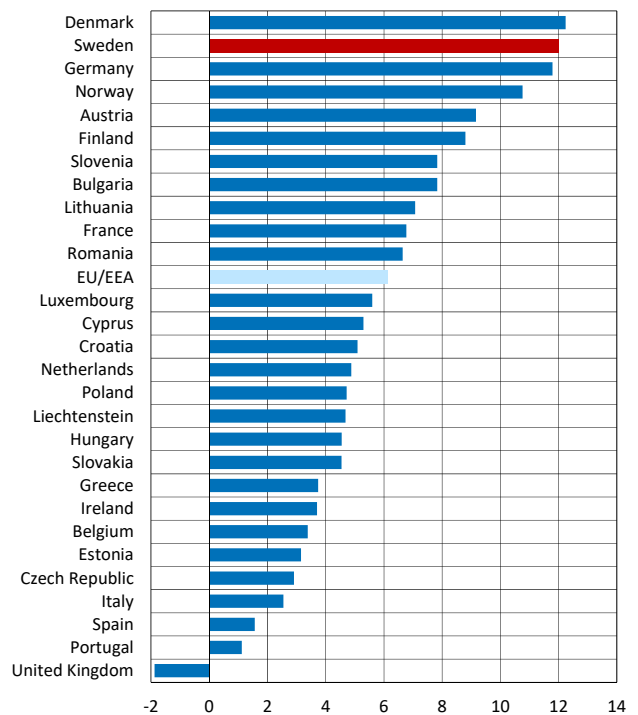
A long period of low interest rates can also make it difficult for life insurance companies to fulfil their commitments to

Chart 2:6. Risk premiums for five-year corporate bonds
Basis points



Note. Difference between bond yield and corresponding swap rate.
Sources: Bloomberg and the Riksbank

Chart 2:7. Maturity mismatch among life insurance companies
Years



Note. Refers to the difference in duration between the life insurance companies’ liabilities and assets in December 2015 for the companies included in the EIOPA stress test. Note that only corporate holdings of bonds are included in the assets, that is, corporate holdings of interest rate derivatives and property are not included.

Source: European Insurance and Occupational Pensions Authority (EIOPA)

²¹ How do low and negative interest rates affect banks’ profitability? Article in *Monetary Policy Report*, April 2016. Sveriges Riksbank.

²² However, these customers can often in turn borrow at negative rates (i.e. they get paid for borrowing), which would suggest that they are better equipped to manage bank deposits at negative rates than smaller entities.

policyholders. To fulfil their commitments, the companies invest in bonds amongst others. But when interest rates are low, the return on the new bonds which the companies reinvest in when bonds in their holdings mature will be lower. 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.²³ Swedish life insurance companies have a relatively large difference in maturity between their commitments and their bond holdings (see chart 2:7). In 2016, the European Insurance and Occupational Pensions Authority (EIOPA) performed a stress test for European insurance companies. In the test, most large Swedish life insurance companies coped with a scenario in which interest rates never fall short of 2 per cent, provided that the equity market and other economic conditions remain unchanged.²⁴ The fact that Swedish companies were able to cope with this scenario is due to them having relatively large assets in relation to the size of their liabilities, that is, their commitments to insurance policyholders. In other words, Swedish insurance companies are comparatively well capitalised (see Chart 2:8). Their assets are, however, made up of a relatively large proportion of equities, making them vulnerable to a major price fall on the equity market.

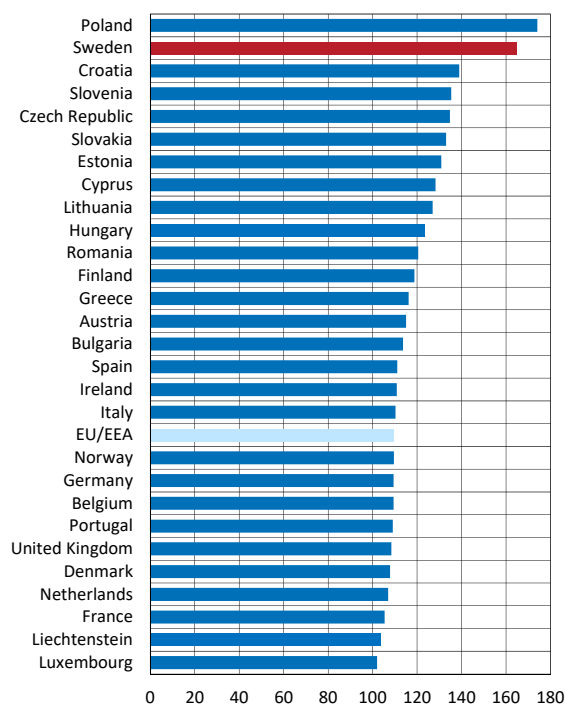
Rising commercial property prices

This report contains an article on the financial stability risks among commercial property companies (see the article "Commercial properties and financial stability"). The article points out that the sector is large, highly cyclical and that these companies have a large share of borrowed capital. Moreover, the major Swedish banks have substantial exposures towards the sector, for instance, via bank loans. In recent years, prices of commercial property have risen rapidly, partly as a result of strong economic activity and low interest rates. The commercial property companies have increased their debts apace with this. Going forward, it is important to continue to keep track of developments in order to identify any changes that may increase the risks to financial stability.

Vulnerabilities and risks linked to household indebtedness

The Riksbank continues to deem that households' high and rising indebtedness entails considerable risks for the Swedish economy. This is an assessment shared by international bodies such as the International Monetary Fund (IMF), the Organisation for Economic Cooperation and Development (OECD), the European Commission and the European

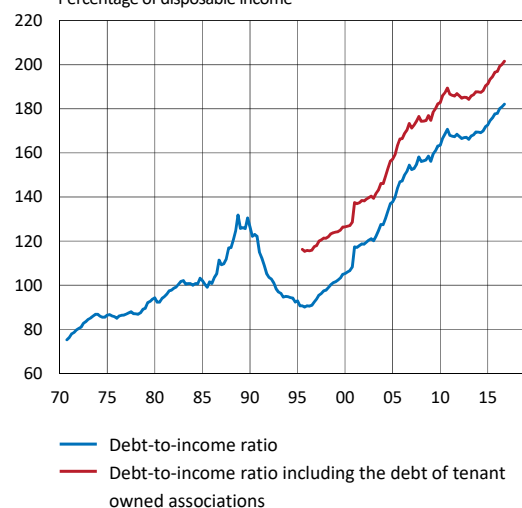
Chart 2:8. Insurance companies' assets as a share of liabilities
Per cent



Note. Refers to the ratio between the size of the life insurance companies' liabilities and assets (commitments) in December 2015 for the companies included in the EIOPA stress test. This is based on the so-called base scenario in the stress test.

Source: European Insurance and Occupational Pensions Authority (EIOPA)

Chart 2:9. Household debt-to-income ratio in Sweden
Percentage of disposable income



Sources: Statistics Sweden and the Riksbank

²³ For a more in-depth description of how low interest rates affect insurance companies, see Gibas, N., Juks, R. and Söderberg, J. (2015), Swedish financial institutions and low interest rates, *Economic Commentaries* No. 16, 2015. Sveriges Riksbank.

²⁴ EIOPA Insurance Stress Test Report, December 2016. EIOPA.

Systemic Risk Board (ESRB).²⁵ Participants on the Swedish financial markets also deem that the risks linked to households' high indebtedness could have major negative consequences for the economy, should they be realised.²⁶

Households are highly indebted

The Swedish households are highly indebted, in both a historical and an international perspective, and are thereby sensitive to shocks in the economy.

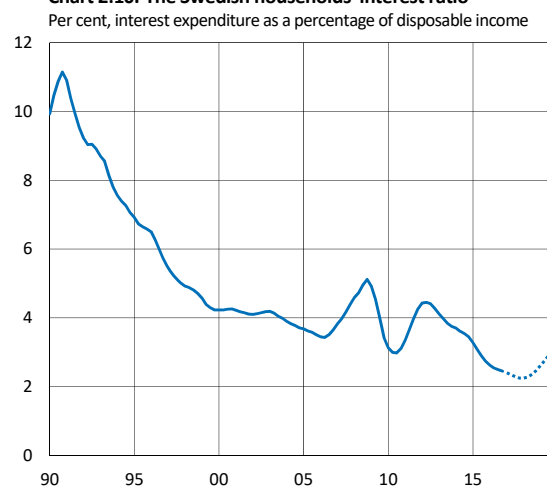
Swedish household debt continues to increase more rapidly than their income. The aggregate debt-to-income ratio (household debt in relation to their disposable income) for the entire household sector has increased to 180 per cent (see chart 2:9). If we look at the stock of mortgage borrowers, the Riksbank's credit data shows that households with mortgages had an average debt-to-income ratio of 343 per cent in August 2016, which is an increase of 5 percentage points compared to 2015.²⁷ Finansinspektionen's (FI's) mortgage survey shows, however, that the debt-to-income ratio among new mortgage borrowers has decreased somewhat, from 406 per cent in 2015 to 402 per cent in 2016.²⁸ This decrease suggests that the amortisation requirement, which came into force in June 2016, has dampened debt-to-income ratios slightly for new mortgage borrowers. The mortgage survey shows that the proportion of new mortgage borrowers who amortise has risen from 67 to 78 per cent between 2015 and 2016. But despite the somewhat restrictive effect of the amortisation requirement on household indebtedness, households are still highly indebted overall.

In addition to their bank loans, many households also have indirect debts in the form of loans taken out by their tenant-owned associations, whose interest expenses and amortisations are partly reflected in their monthly fees. The debts of Swedish tenant-owned associations amount to SEK 428 billion.²⁹ The aggregate debt-to-income ratio for households including loans via tenant-owned associations amounts to 200 per cent (see chart 2:9).

Households are increasingly sensitive to shocks in the economy

The historically low interest rates mean that households' housing expenditure is currently low. The generous tax relief for interest expenses reduces their housing expenditure still further. The current conditions for households to repay their loans are therefore deemed to be good.

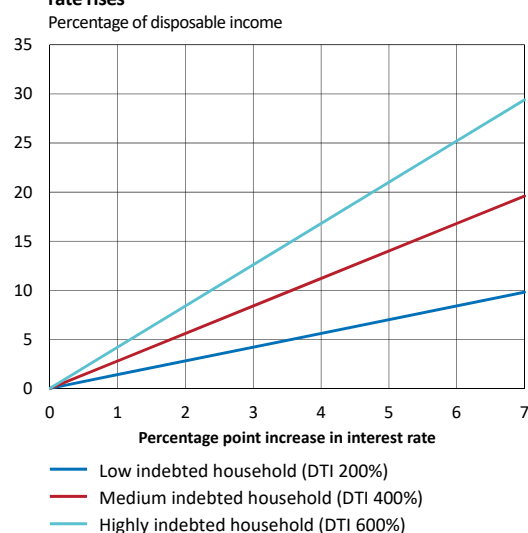
Chart 2:10. The Swedish households' interest ratio



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

Sources: Statistics Sweden and the Riksbank

Chart 2:11. Households' extra interest expenses if the interest rate rises



Note. Change in interest expenses as a proportion of disposable income if the interest rate rises for low, medium and highly-indebted households. Interest expenditure has been adjusted to include tax relief.

Source: The Riksbank

²⁵ See, among others, *Country Report Sweden*, February 2017. European Commission and *Article IV Consultation with Sweden - Concluding Statement of the IMF Mission*, September 2016. International Monetary Fund (IMF).

²⁶ *Market participants' views on risks and the functioning of the Swedish fixed-income and foreign exchange markets*, May 2017. Sveriges Riksbank.

²⁷ van Santen, P and Ölcer, D. (2016), Household indebtedness in Sweden – update for 2016, *Economic Commentaries* No. 5, 2016. Sveriges Riksbank.

²⁸ *The Swedish Mortgage Market 2017*. Finansinspektionen.

²⁹ *Financial Market Statistics*, March 2017. Statistics Sweden.

At the same time, the growth of household debt to historically high levels has made the households more sensitive to changes that affect their finances. The fact that 67 per cent of the mortgage stock is borrowed at a variable rate of interest and 71 per cent of new mortgage borrowers take loans 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 are expected to remain low in the years ahead (see chart 2:10), but if interest rates rise to more normal levels, it will have a major impact on households' interest expenses.³⁰

If mortgage rates rise, households are affected depending on the size of their debts. If mortgage rates rise by, for instance, five percentage points, a household with a debt-to-income ratio of 200 per cent, that is, a relatively low debt, would spend seven per cent more of its disposable income on paying interest expenditure as a result of the increase in the interest rate (see chart 2:11). This is in addition to the interest they already pay. A household with larger debts, a debt-to-income ratio of 600 per cent, a similar interest rate increase would involve an additional interest expenditure of 22 per cent of the household's disposable income. FI's stress tests of new mortgage borrowers show that households overall have good margins and that only just above one per cent of mortgage borrowers have a deficit in their monthly calculations.³¹ But a rate rise of for example five percentage points would mean that the proportion of households with a deficit in their monthly calculations would increase from just over one per cent to almost six per cent and even if the households does not face negative monthly calculations, an increase in the interest rate means that the scope for consumption declines.

Tenant-owned associations also have a large proportion of variable-rate loans. At one Swedish bank, SBAB, for example, about 30 per cent of tenant-owned association loans are variable-rate loans.³² The average debt of tenant-owned associations per square meter is about SEK 4,400³³, which means that households who own tenant-owned housing can be even more affected by rising interest rates. If the co-operative, as a result of rising interest rates, has to increase its fees to pay its bank loans, the household will not only have to pay higher monthly fees but also pay a higher rate of interest on its own bank loan.

Tenant-owned associations and financial stability

There are about 26,000 active tenant-owned associations in Sweden. A tenant-owned association is an economic association, run in accordance with the prime cost principle. The association's monthly fees to its members shall cover its running costs including depreciation, amortisation and interest expenses. As a "legal person", a tenant-owned association can enter into agreements, own assets and incur liabilities.

The members of the association do not actually own the apartments they live in. Instead, the association grants each member a usufruct, i.e. the right to use the apartment as a home. However, as members of the association, the residents or "tenant-owners" indirectly own the property in which they live. As a result, the association's members can be affected if the association's financial conditions change, which can ultimately have consequences for financial stability.

If a tenant-owned association, due to rising interest rates, for example, has to increase its fees to be able to pay for its bank loans, its members may have to pay higher fees. This may have negative consequences for already highly indebted tenant-owners.

If the financial conditions deteriorate to such a degree that a tenant-owned association goes bankrupt, the association ceases to exist and the property becomes part of the bankruptcy estate. In such a situation, the members then become tenants instead of tenant-owners and they normally lose any capital they have invested in their home. If they have taken out a mortgage to buy their apartments, the underlying asset, i.e. their tenant-owned home, will be lost in the event of a bankruptcy. In addition to affecting the members' finances, this may also have consequences for any lenders who have funded the tenant-owned association and its members.

It is, however, unusual for a tenant-owned association to go bankrupt. In the wake of the crisis in the 1990s, about 500 tenant-owned associations went bankrupt. The common factor for these associations was that they were relatively newly established. The majority consisted of detached, semi-detached or town houses. At that time, tenant-owned associations had the right to deduct paid interest expenses from tax. When the tax relief was gradually reduced, at the same time as inflation and property prices fell, the situation became untenable for many associations. Their financial calculations were, in many cases, based on the old rules governing tax relief on interest expenditure, and on a subsidy system based on high inflation. As a result of these factors, the high production costs was nevertheless regarded as manageable for the association.

³⁰ There is also considerable uncertainty as regards what can be considered long-term normal interest rate levels, see for instance Armelius, H., Bonomolo, P., Lindskog, M., Rådahl, J., Strid, I. and Walentin, K. (2014), Lower neutral interest in Sweden?, *Economic Commentaries* No. 8, 2014. Sveriges Riksbank. See also The long-term repo rate. Article in *Monetary Policy Report*, February 2017. Sveriges Riksbank.

³¹ Households' monthly calculations, or discretionary income calculations, show how much the household has left at the end of the month after housing costs and other living costs have been considered.

³² *Bostadsrättsföreningarna ökar ränterisken något* (The housing cooperatives increase the interest risk somewhat), April 2017. SBAB.

³³ This refers to the tenant-owned association's average debt per square metre in 2014 according to Värderingsdata.

It is therefore important for households looking to buy a home to be aware of all their loans and to leave themselves a good enough margin in case of both loss of income and the effect of interest rate rises on their own loans and their monthly fee.

High indebtedness poses risks to the Swedish economy

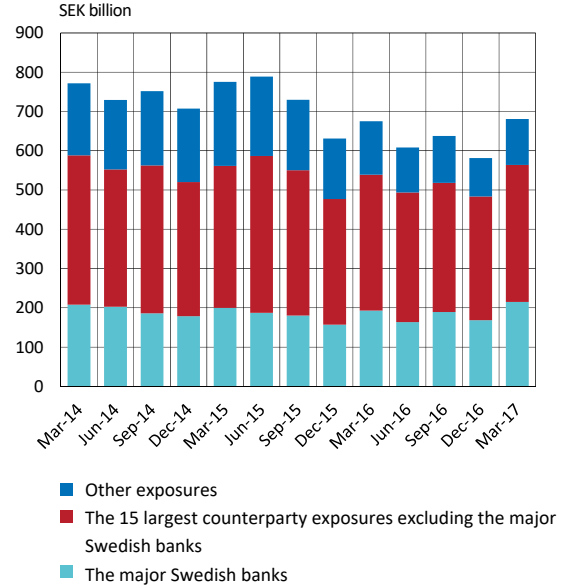
The high indebtedness in combination with rising housing prices are inflating households’ balance sheets. At the same time, households have a high aggregate saving ratio, i.e. a lot of savings in relation to their disposable income, which suggests that they have, generally speaking, built up buffers that can be used in the event of various types of shocks. There is a lack of information, however, on how savings and assets are distributed among different households. It is therefore not possible to see whether it is the most indebted households that have the greatest buffers. However, statistics from 2002-2007 show that households with the highest debt-to-income ratios have on average larger illiquid assets than other indebted households. This is because these households often buy a home financed by a mortgage. Statistics also show, however, that the most highly indebted households also have the least liquid assets.³⁴ If households are unable or do not wish to sell their home in a stressed scenario, this indicates that the most highly indebted households have relatively small buffers to cope with unexpected economic shocks.

Large debts may therefore be particularly problematic if economic growth were to be significantly worse than expected. Highly-indebted households may then need to significantly reduce their consumption, particularly if housing prices also start to fall. Waning consumption may in turn reduce the profitability of Swedish companies and lead to higher unemployment, which may ultimately lead to increased credit losses for the banks. Confidence in the banks could weaken in such a situation, which could also affect both access to and the cost of the banks' funding. There is therefore a risk of economic development entering a downward spiral with serious consequences for both financial and macroeconomic stability.³⁵

Vulnerabilities and risks in the Swedish banking system

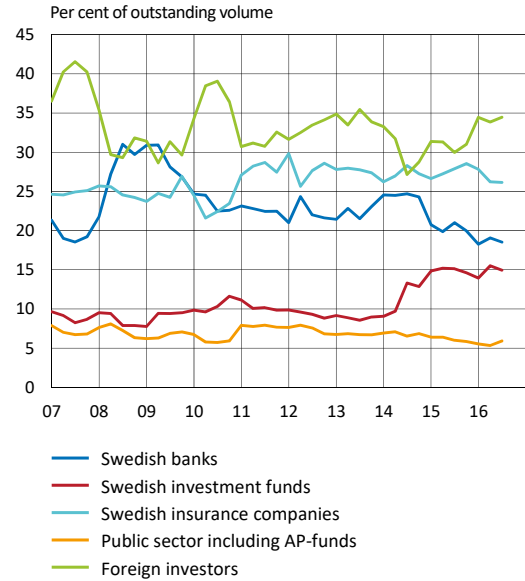
Recently, the major Swedish banks have continued to report good financial results. The major banks are currently profitable, have minor credit losses and are cost-efficient, a situation which the Riksbank deems will continue going

Chart 2:12. The major Swedish banks' counterparty exposures through securities holdings



Note. The chart shows the breakdown of the major banks' total securities holdings on the basis of who issued the securities.
Source: The Riksbank

Chart 2:13. Owners of Swedish covered bonds



Source: The Riksbank

³⁴ 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.

³⁵ Emanuelsson, R., Melander, O. and Molin, J. (2015), Financial risks in the household sector, *Economic Commentaries* No. 6. Sveriges Riksbank.

forward. As before, the Riksbank sees vulnerabilities and risks in the Swedish banking system.

Structural vulnerabilities in the Swedish banking system

The Swedish banking system is large in relation to the Swedish economy and in a European perspective. At the end of 2016, the total assets of the Swedish banking system amounted to about 400 per cent of Sweden's GDP, about 330 per cent of which were held by the major banks.³⁶

Nordea changed its corporate structure at the start of 2017. According to the new structure, foreign subsidiaries have been converted into branches of Nordea's Swedish parent company. This means in turn that Sweden now has a greater responsibility for the supervision of Nordea's foreign operations. In a crisis situation, Sweden may therefore need to supply liquidity to Nordea's branches abroad, in addition to its Swedish operations. The new structure thus entails further risks for the Swedish banking system and public sector finances.³⁷

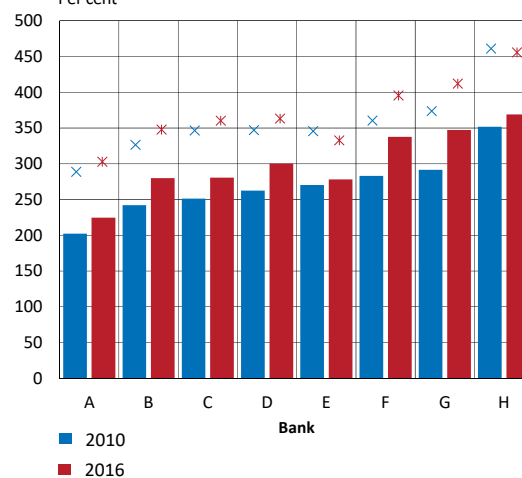
The Swedish banking sector is strongly concentrated. The four major banks, Handelsbanken, Nordea, SEB and Swedbank, are responsible for around 70 per cent of lending in Sweden and approximately the same share of deposits.

The major banks also have significant exposures to each other in that they, amongst others, own each other's securities, making them closely interconnected (see chart 2:12). This is not least true of covered bonds, which the banks issue to fund their mortgage lending (see chart 2:13). Despite a recent years' slight reduction in the major Swedish banks' ownership of each other's covered bonds, their interconnectedness is still considerable.

In addition, the major banks have large amounts of loans with houses and other types of property as collateral on their balance sheets. At present, these loans amount to about 70 per cent of total lending. This means that they have significant exposures towards the housing market and the commercial property market. In addition, some banks have more indebted households as customers than other banks (see chart 2:14). This could mean that certain banks have customers who are more sensitive to shocks than other banks, which can also affect the bank itself.

The banking system's structure therefore implies that problems in one bank can quickly spread to other banks and markets, and damage confidence in the entire financial system. The framework for the recovery and resolution of credit institutions and investment firms (BRRD) is for shareholders and creditors to fully absorb losses and there are strict rules governing when and how tax revenues may be used. Nevertheless, the structure of the banking sector means

Chart 2:14. Debt-to-income ratios for the banks' customers
Per cent



Note. Columns A-H represent the banks. The columns represent the median DTI level, while the crosses denote the average DTI level for each bank.

Source: The Riksbank

³⁶ The calculation is based on Sweden's GDP for the whole year 2016 and Swedish banks' assets (including the major banks' assets abroad) for March 2017.

³⁷ Consultation response to Nordea's applications for permission to implement merger plans, April 2016. Sveriges Riksbank.

that any problems in the banks may be very expensive for the government to deal with.

The major banks are exposed to liquidity risks

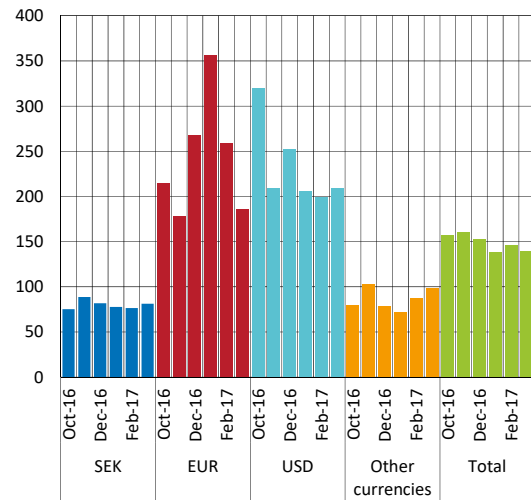
The Swedish banks are exposed to both short-term and structural liquidity risks. A short-term liquidity risk implies that a bank would be unable to repay the liabilities that mature in the near term if it were to have difficulty renewing its funding. A structural liquidity risk, on the other hand, arises when there is a maturity mismatch between a bank's assets and liabilities in the longer term. Although maturity transformations are a normal part of a bank's operations, it is important for Swedish banks to have sufficient funds to be able to manage the liquidity risks that arise from these operations. The aim of the highly liquid assets is for them to be used to cover any outflows from the bank during a period of financial stress.

The short-term liquidity risks can be measured in terms of liquidity coverage ratios, LCRs. Over the past six months, the major Swedish banks have continued to report high LCRs in the currencies for which they are required to do so by FI (see chart 2:15).³⁸ Periodically, however, some of the major banks have low LCRs in Swedish kronor and in other significant currencies for which there are no corresponding requirements (see chart 2:16). A significant currency is a currency that comprises more than five per cent of a bank's total debts.³⁹ This means that the banks have greater short-term liquidity risks, measured as LCRs, in these currencies.⁴⁰

Banks fund about half of their lending with wholesale funding, about two-thirds of which is in foreign currency. Much of the foreign wholesale funding is used to cover short-term liquidity needs in Swedish krona and other significant currencies. This is possible because the banks can convert foreign currency to, for example, Swedish krona on the foreign exchange swap market. 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. It is therefore important for the banks to insure themselves to a greater degree against this liquidity risk, for example by holding a greater proportion of liquid funds in these currencies.

One way of calculating 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 for Swedish banks (see chart 2:17), which exceeds the level that the EU will require from January 2018. However, the Riksbank does not consider that the NSFR, in its current form, captures

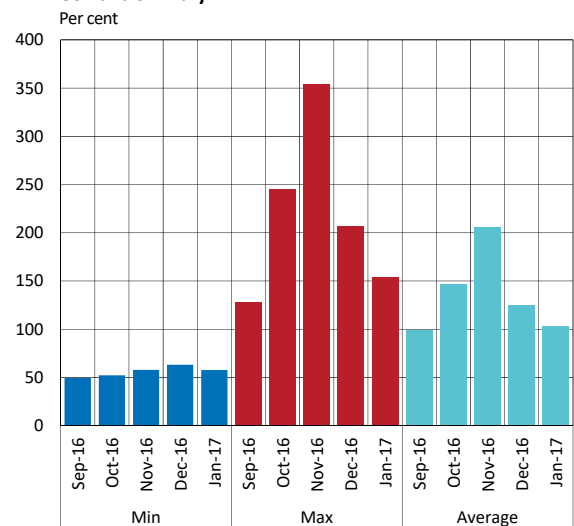
Chart 2:15. The major banks' LCRs in different currencies
Per cent



Note. Refers to a weighted average.

Source: Finansinspektionen

Chart 2:16. The banks' LCRs in significant currencies excl. EUR, USD and SEK vary
Per cent



Note. Refers to individual banks' minimum, maximum and average LCR levels in specific currencies excluding EUR, USD and SEK during the period September 2016 to January 2017.

Sources: Finansinspektionen and the Riksbank

³⁸ The LCR requirements from Finansinspektionen cover euros, US dollars and all currencies in total.

³⁹ According to the Basel Accord and the European Commission's delegated Regulation 2015/61 on LCR.

⁴⁰ Short-term liquidity risks in significant currencies, Article in *Financial Stability Report* 2016:2. Sveriges Riksbank.

the large mismatch in maturities that exists between banks' assets and liabilities. For example, on the asset side, the banks have a large proportion of mortgages with long maturities, while, on the liability side, they have relatively short-term wholesale funding (see chart 2:18).

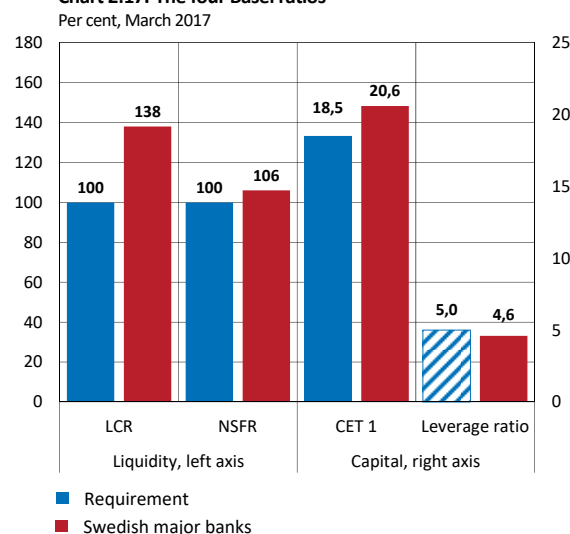
Banks' capital ratios

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 (core tier one capital ratios) has increased in recent times and was 20.6 per cent in March 2017 (see chart 2:17). 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 they could conceivably affect the banks' capital requirements.⁴¹

The banks also reported improvements in the non-risk-weighted capital measure, the leverage ratio, for December 2016. However, this effect is due to the banks reducing their assets temporarily over the turn of the year at the same time as their capital was unchanged. One of the reasons for this is the resolution fee, which is based on the size of the banks' balance sheets at the end of each year. By temporarily reducing their balance sheets, the banks can pay a smaller fee. Over the last twelve months and ignoring the temporary effect at the turn of the year, the leverage ratio has not increased to any great degree and has been around 4-5 per cent. At the same time, the Riksbank's new study, which considers both social benefit and any costs for capital requirements, indicates that a well-balanced leverage ratio for Swedish banks would be in the interval of 5-12 per cent (see chapter 3).⁴²

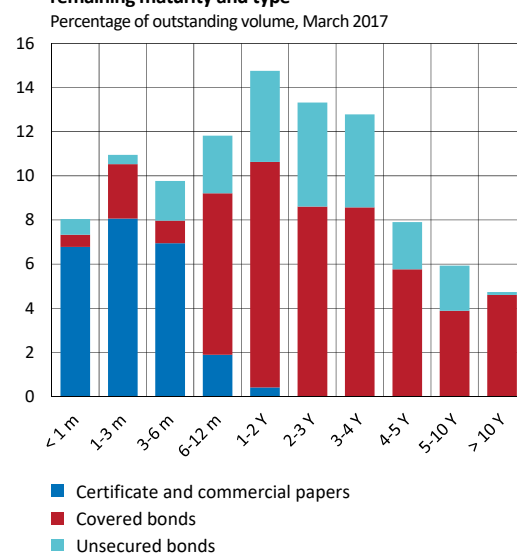
Chart 2:17. The four Basel ratios



Note. The minimum level of the leverage ratio has not yet been determined, so the chart shows the level that the Riksbank recommends should apply from 2018. CET 1 is an abbreviation of Common Equity Tier 1, the minimum level and actual capital ratios are calculated as weighted averages. CET 1 and requirement refer to the fourth quarter of 2016.

Sources: Bank reports, BIS and the Riksbank

Chart 2:18. The banks' outstanding securities broken down by remaining maturity and type



Source: The Riksbank

⁴¹ 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.

⁴² Suitable capital ratios in major Swedish banks – new perspectives, *Staff Memo*, May 2017. Sveriges Riksbank.

CHAPTER 3 – Recommendations

Households' high and rising indebtedness continues to form a serious threat to financial and macroeconomic stability. It is therefore important to continue with measures to increase resilience in the household sector and reduce the risks. At the same time, there are structural vulnerabilities in the Swedish banking system that make it sensitive to shocks. Therefore it is important that the resilience of the banking system is strengthened as regards to both the banks' capital levels and their ability to manage liquidity risks.

Measures are needed to strengthen the resilience of the financial system

For a long time, the Riksbank has recommended measures both to reduce the risks of household indebtedness and to strengthen the banks' resilience. The Riksbank has also recommended a clarification of the mandate of Finansinspektionen (FI) and its tools for macroprudential policy. These recommendations remain (see table 3:1).⁴³

The risks inherent in household indebtedness need to be managed.

Households' high and rising indebtedness continues to form a serious threat to financial and macroeconomic stability. Socioeconomic imbalances are expected to increase unless measures are taken. This may ultimately be very costly for Sweden's economy. It is therefore important to continue with measures to increase resilience in the household sector and reduce the risks, particularly in the current low interest rate situation. This requires a mix of measures. Both measures to achieve a better balance between supply and demand on the housing market and tax reforms to reduce the willingness or ability of households to take on debt are required.

Macroprudential policy measures also need to be taken. The amortisation requirement introduced on 1 June 2016 is a step in the right direction, but more measures are needed. A large increase in the repo rate would certainly slow down the build-up of debts but would also lead to a much higher unemployment, stronger exchange rate and lower inflation. Other measures more specifically aimed at reducing the risks associated with household debt have less negative effects on the economy as a whole.

Several international organisations, including the International Monetary Fund (IMF),⁴⁴ the European Systemic

Table 3:1. The Riksbank's current recommendations

	Introduced in the report
The mandate for macroprudential policy	
The Government and the Riksdag should promptly clarify FI's mandate and instruments for macroprudential policy.	2015:1
Household indebtedness	
It is urgent that the Government 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.	2015:2 2014:1 2017:1 rev
Banks' capital levels	
FI should introduce a leverage ratio requirement for major Swedish banks of 5 per cent from January 2018.	2014:2 2017:1 rev
FI should set the countercyclical capital buffer value at 2.5 per cent with the aim of increasing banks' resilience.	2014:1
The major banks' liquidity risks	
FI 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.	2014:1
FI should set LCR requirements in all significant currencies for the major Swedish banks.	2016:2
The major Swedish banks should continue to reduce their structural liquidity risks and achieve a Net Stable Funding Ratio (NSFR) of at least 100 per cent.	2011:2 2016:2 rev
The major Swedish banks should report their LCRs in Swedish kronor and other significant currencies at least once a quarter.	2013:2 2016:2 rev
The major Swedish banks should report their Net Stable Funding Ratios (NSFR) at least once a quarter.	2013:1

⁴³ For fulfilled recommendations, see table A:4 in the Annex.

⁴⁴ *IMF Country Report No. 16/353 Sweden*, November 2016. International Monetary Fund (IMF).

Risk Board (ESRB),⁴⁵ the European Commission⁴⁶ and the OECD⁴⁷ also continue to point out that risks are accumulating on the Swedish housing and mortgage market. Like the Riksbank, they say that measures are needed within several different policy areas to reduce the risks.

It is urgent that the major banks have enough capital.

The Riksbank considers it a matter of urgency that the major banks have sufficient capital. It is positive therefore that FI in 2016 decided to tighten the requirement for the counter-cyclical capital buffer and adopted measures that increase the capital requirement for Swedish banks that use internal models to calculate risk weights for corporate exposures.⁴⁸ It is the Riksbank's opinion, however, that resilience in the Swedish banking system needs to be further strengthened. The Riksbank therefore considers that a higher leverage ratio requirement than the proposed minimum level of 3 per cent in the EU's so called banking reform package (see fact box on this page) shall be imposed on the major Swedish banks. According to the Riksbank, FI should introduce a leverage ratio requirement of 5 per cent for the major Swedish banks as from January 2018.

Urgent that the major banks manage their liquidity risks in all significant currencies.

Sweden has a large, cross-border banking sector with significant funding in foreign currency. Weak resilience among Swedish banks to liquidity stress in Swedish kronor or foreign currency can pose significant risks to financial stability. The Riksbank therefore wishes to emphasise how important it is that the banks themselves arrange self-insurance by holding adequate liquidity reserves, so that they have a good capacity to manage the liquidity risks they take in their operations themselves.⁴⁹ The Riksbank is of the opinion that FI should set liquidity coverage ratio (LCR) requirements for the Swedish banks in all significant currencies.⁵⁰ The Riksbank also thinks that the major Swedish banks should report their LCRs in all significant currencies at least once a quarter.

In its assessment of the Swedish financial sector, the IMF recommends that FI should start to monitor the banks' liquidity coverage ratios (LCRs) in dollars and euros in three months' term, in addition to the current 30-day LCR. This is aimed at improving the supervision of the banks' liquidity risks. This is an interesting proposal that should be investigated further.

The banking reform package – new EU regulations for European banks

At the end of 2016, the European Commission published a proposal for certain amendments and complements to the regulations and directives governing the banks' capital levels and liquidity management. This proposal is known as the banking reform package. The proposal primarily means that some of the international agreements previously concluded by the Basel Committee and the Financial Stability Board (FSB) will be implemented in the EU. For example, the proposal includes a leverage ratio requirement of 3 per cent for European banks and a future requirement for a Net Stable Funding Ratio (NSFR) and amendments to the EU's crisis management regulations. In addition, the European Commission proposes that major systemically important banks in the EU should have a minimum level of liabilities that can be converted into capital in the event that the bank enters into resolution. Amendments to the manner in which so-called Pillar 2 requirements may be applied are also included in the banking reform package. All of this, taken together, may change the capital requirements and liquidity regulations with which Swedish banks must comply at present. The proposals in the banking reform package are currently being negotiated by the EU, with the target of agreeing on a common proposal in 2018. The Ministry of Finance is participating in these negotiations on Sweden's behalf.

⁴⁵ ESRB/2016/11 on medium-term vulnerabilities in the residential real estate sector of Sweden, September 2016. European Systemic Risk Board (ESRB).

⁴⁶ Burgert, M., D'Souza P. and Vermeulen G. (2016). House prices and indebtedness in Sweden: A model-based assessment of policy options. European Commission.

⁴⁷ OECD Economic Surveys: Sweden, February 2017. OECD.

⁴⁸ See Finansinspektionen Registration Number 16-742 (2016), and Finansinspektionen Registration Number 15-13020 (2016).

⁴⁹ Financial Stability Report 2016:2. Sveriges Riksbank.

⁵⁰ According to the Basel Accord and the European Commission's delegated Regulation 2015/61 on LCR, a currency that constitutes more than five per cent of a bank's total funding is considered to be a significant currency for that particular bank.

The foreign currency reserve plays an important role in a crisis situation.

A natural starting point is that the banks should have larger buffers in order to insure themselves against the short-term liquidity risks they take in foreign currency. But it is also necessary that the Riksbank has a sufficient foreign currency reserve. No self-insurance provides perfect protection. A foreign currency reserve is, amongst others, aimed at upholding confidence in the financial system and reducing the socioeconomic costs of a financial crisis. If problems should arise that threaten financial stability, the Riksbank needs to be able to provide liquidity support to both individual institutions and to the banking system as a whole. This ability to provide liquidity support is also an important precondition for monetary policy as this demands that the financial system functions well. The Riksbank can always provide Swedish kronor, while foreign currency – if this is not present in a foreign currency reserve – must, on the other hand, be acquired. Doing this in a crisis situation entails a high level of risk as it may be more expensive and take longer to carry out (see the article “A cross-border banking sector with major assets and liabilities in foreign currency poses risks to financial stability”).

New regulations to increase the resilience of the banks are being drafted internationally.

The European Commission has presented several proposed amendments to the current European banking regulations under the framework of the so-called banking reform package (see the fact box on this page).⁵¹ The proposals will be negotiated with the European Council and European Parliament in 2017, with the intention being that large parts will be decided upon in 2018. One of the proposals concerns the regulations for calculating the minimum requirement for own funds and eligible liabilities (MREL)⁵² in the banks. The aim of these is for the banks to have a minimum level of liabilities that can be converted to capital in the event of resolution.⁵³

On the national level, the Swedish National Debt Office, which is the resolution authority in Sweden, decided, in February 2017, how MREL requirements for the Swedish banks are to be calculated.

Apart from this, new standards for financial reporting, IFRS 9, are being prepared, which are largely aimed at tightening up reporting to provide a better view of how financial risks are managed with financial instruments. Among other things, the standards require the banks to make provisions for non-performing loans and write-downs of

⁵¹ *Proposal for a regulation of the European Parliament and of the Council amending Regulation (EU) No 575/2013 and Regulation (EU) No 648/2012*, 23 November 2016. European Commission.

⁵² Minimum requirement for own funds and eligible liabilities.

⁵³ Consultation response to the proposal referred to the Council on Legislation regarding the Riksbank's financial independence and balance sheet, (dnr 2016-00396), May 2016. Sveriges Riksbank.

credit losses at an earlier stage. When IFRS 9 is introduced in the financial year 2018, the banks' reported provisions for credit losses are expected to increase. This, in turn, will entail a reduction of the banks' reported capital.⁵⁴

On the global level, the Basel Committee⁵⁵ is engaged in final negotiations of the last parts of the Basel III packet, which could involve amended capital requirements for certain banks going forward. Well-capitalised banks benefit financial stability, contribute towards the positive development of the economy and reduce the risk of a financial crisis. These new regulations will therefore strengthen global financial stability in the period ahead and are important for Sweden, which has a large banking sector and, at the same time, a small and open economy. At the same time, it must be emphasised that it is the Swedish authorities that more exactly determine how Basel III will affect the Swedish banking system. The recommendations presented in this report are focused on the Swedish regulatory framework.

Recommendation regarding the mandate for macroprudential policy

The Government and Riksdag should clarify FI's mandate and tools for macroprudential policy without delay.

In Sweden, the Government has allocated the main responsibility for macroprudential policy to FI. It has become evident, however, that 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.

On 23 February, the Swedish Ministry of Finance presented a legislative proposal that aims to give FI further tools for macroprudential policy. The proposal involves, for instance, credit institutions not being allowed to conduct their operations in a way that contributes to financial imbalances on the credit market. The proposal aims to give FI legislative support to use – with the Government's consent – tools such as a debt-to-income limit and an interest-fixation period to counteract the risks entailed in household indebtedness. The reason why FI shall obtain the Government's consent before adopting any new regulations is, according to the proposal, because this type of measure may have effects on both the macro economy and the finances of private individuals. The proposal also means that the process for implementing

⁵⁴ According to a study by the European Banking Authority (EBA), the average reduction of the CET 1 capital ratio is estimated at 59 basis points. See *Report on results from the EBA impact assessment of IFRS 9*, November 2016. European Banking Authority.

⁵⁵ The Basel Committee on Banking Supervision is the main standard-setter for global banking regulations but is also an important forum for global cooperation around issues concerning the supervision of banks. The Basel Committee develops minimum standards, so countries are free to introduce more stringent regulations.

measures will be clearer and shorter. It is proposed that the legislative amendments enter into force on 1 February 2018.⁵⁶

The Riksbank welcomes the Ministry of Finance's proposal to give FI greater capacity to decide on macroprudential policy tools. These tools are designed to avoid or alleviate the consequences of financial crises. However, the conditions for a financial crisis build up over a long period of time and measures therefore need to be implemented at an early stage. Macroprudential policy tools can entail increased costs for individual households and institutions in the short term, but in the long term they aim to have positive socioeconomic effects. The Riksbank therefore considers that it is very important to have a clear allocation of responsibility between the Government and FI. Otherwise, there is a greater risk that decisions will be delayed or not be made at all. It is proposed in the memorandum 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 is for the Government to decide which macroprudential policy tools are to be delegated to FI and within what framework FI may apply them. FI will then decide on measures within this framework. This system is in line with the ESRB's recommendation on macroprudential policy, which entails the authority responsible for macroprudential policy having operational independence.⁵⁷

Macroprudential policy is a relatively new policy area, which is still under development. This means that one will gradually need to develop a toolbox with various types of tool to be used to reduce systemic risk.

Recommendation on measures to reduce risks linked to household indebtedness

It is urgent that the Government and responsible authorities as soon as possible adopt 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 the prompt implementation of measures to reduce the risks linked to household debt is of the utmost importance as these risks can result in large-scale costs for the economy should they materialise. The Riksbank considers that a combination

⁵⁶ As no final proposal exists and it has not yet resulted in a bill to parliament, this recommendation still stands.

⁵⁷ Recommendation of the European Systemic Risk Board (ESRB) of 22 December 2011 on the macroprudential mandate of national authorities (ESRB/2011/3). European Systemic Risk Board.

of different measures is required – in several different policy areas – to reduce the risks in an appropriate manner.^{58,59} 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). Reforms are therefore needed on the housing market to create a better balance between supply and demand. Although housing construction has recently increased significantly, 255 out of 290 municipalities consider there to be a deficit of housing on the market.⁶⁰ Furthermore, the rent-setting system creates supply limits and lock-in effects that make it particularly difficult for young people and people who are not yet established on the housing market to find housing.

Lock-in effects are also created by the current rules for the taxation of capital gains on property sales as they discourage households from moving house. It is therefore important that concrete measures are introduced, so that housing construction can increase and the existing housing stock can be used more efficiently.⁶¹

With regard to tax regulations for home-owners, these could be designed in different ways, either by regular taxation of the actual property or by taxing their purchase and sale. In order to dampen the development of housing prices and household debt, a holistic approach needs to be taken and a review is needed of the capital gains taxation when homes are sold, of the property taxation and of the current tax relief on interest expenditures. This does not necessarily mean that total taxation must increase to restrain this development.

A further potential macroprudential policy measure would be to introduce a debt-to-income limit that restricts how much a household may borrow in relation to its income.⁶²

Another feasible measure is to review the regulatory framework to give banks a greater incentive to provide loans with long interest-rate fixation periods, and give households a greater incentive to choose such loans. This would make households less sensitive to interest rate adjustments. Such a measure could be particularly significant after a long period of very low interest rates. FI could also reduce the loan-to-value limit and set minimum requirements for banks' standard values in their discretionary income calculations,⁶³ which form part of their credit assessments, so that households have larger financial buffers when being granted mortgages.

⁵⁸ The measures to manage financial risks in the household sector, Article in *Financial Stability Report 2015:1*. Sveriges Riksbank.

⁵⁹ 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.

⁶⁰ *2017 Housing Market Survey*. The Swedish National Board of Housing, Building and Planning.

⁶¹ 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.

⁶² Effects of a debt-to-income limit. Fact box in *Financial Stability Report 2016:2*. Sveriges Riksbank.

⁶³ 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.

Another possibility is to raise the risk-weight floor for mortgages, which would mean that the banks need to allocate more capital for their mortgage loans. This would strengthen their resilience. An increase of the risk-weight floor from 25 per cent to 35 per cent, for example, would increase the requirement for the major banks' CET 1 capital for mortgages to the level that applied prior to 2007. This would also correspond to what already applies for banks that use the so-called standard method to calculate risk weights for mortgages.

Recommendations regarding banks' capital levels

FI should introduce a leverage ratio requirement for major Swedish banks of 5 per cent from January 2018.

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 means that banks underestimate their risks and therefore hold too little capital. The Riksbank therefore considers it important 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 banks hold a certain volume of capital in relation to their total assets. According to the European Commission's proposal in the so-called banking reform package mentioned above, a leverage ratio requirement of 3 per cent will be introduced within the EU. This is in line with the leverage ratio requirement the Basel Committee agreed on earlier.⁶⁴ However, several countries with large and interlinked banking systems have decided to introduce a leverage ratio requirement higher than the coming international minimum. This applies for instance to Switzerland, the United Kingdom and the United States. Given the size and the vulnerabilities of the Swedish banking sector, the Riksbank believes that Sweden should also have a minimum leverage ratio requirement higher than the coming international minimum. However, the Riksbank considers that the requirement should be set at 5 per cent.⁶⁵ The requirement could take the form of a

⁶⁴ 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.

⁶⁵ According to the Basel Committee's definition.

minimum requirement of 3 per cent with an additional buffer requirement of 2 per cent.⁶⁶

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 (see fact box on page 28).⁶⁷ These 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 higher requirement.

In March 2017, the major Swedish banks' leverage ratios were between 4.4 and 4.7 per cent (see chart 3:1). One means for the banks to increase their leverage ratios to 5 per cent is to increase their total equity. If the banks do this by retaining the profits they are expected to make in 2017, it will correspond to an increase in the leverage ratio levels of around half of a percentage point.

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

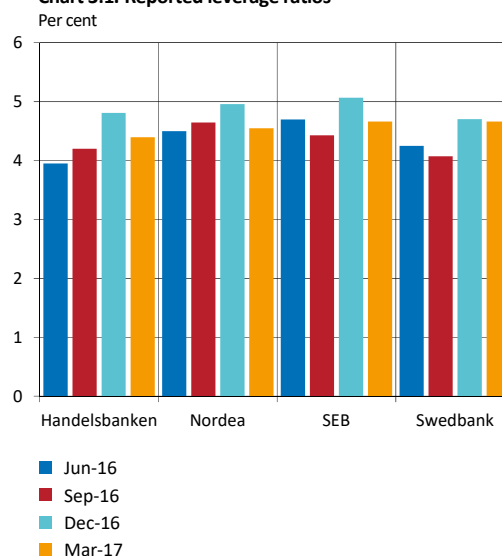
The countercyclical capital buffer aims to strengthen the resilience of Swedish banks when systemic risks accumulate, that is, before they actually materialise. FI has proposed that the countercyclical capital buffer for Sweden shall be 2 per cent from 19 March 2017. Previously, the buffer value was 1.5 per cent. The Riksbank considers the gradual upward adjustment in the buffer value to be important in order to strengthen the banks' resilience. However, the Riksbank assessment is that the countercyclical capital buffer should be set slightly higher, at 2.5 per cent, as a result of the systemic risks that have built up over several years.⁶⁸

Recommendations regarding the major banks' liquidity risks

FI 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 relatively small liquidity buffers in Swedish kronor in recent years (see chart 3:2). Some of the major banks have periodically shown low LCRs around 25–30 per cent, which indicates that their preparedness to face unexpected outflows of cash is at times too low. To ensure that the banks' liquidity in Swedish kronor do not fall too low, FI should require liquidity coverage ratios

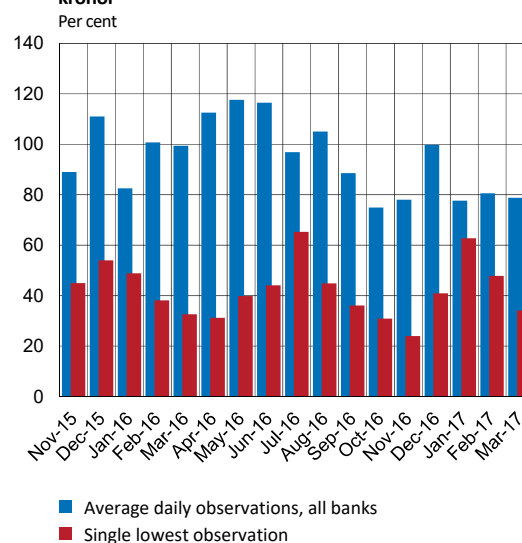
Chart 3:1. Reported leverage ratios



Note. According to the EU's capital requirements regulation (CRR).

Source: Bank reports

Chart 3:2. The major Swedish banks' daily LCRs in Swedish kronor



Note. Average daily LCR in Swedish kronor per month, and the single highest and lowest observations each month.

Source: The Riksbank

⁶⁶ *Financial Stability Report 2014:2*. Sveriges Riksbank.

⁶⁷ Suitable capital ratios in major Swedish banks – new perspectives, *Staff Memo*, May 2017. Sveriges Riksbank.

⁶⁸ According to the Capital Adequacy Directive, FI may set a buffer value that is higher than 2.5 per cent if this is justified, but a buffer of more than 2.5 per cent will not apply to foreign companies' branches in Sweden without the prior approval of the authorities in the company's home country.

in Swedish kronor.⁶⁹ The requirement should be set to at least 60 per cent.

To gain a better understanding of what an LCR of 60 per cent entails, one can simply recalculate this as how many days a bank would manage with the liquidity buffers it has, without access to further liquid funds. With an LCR of 100 per cent, a bank's liquidity buffers would last for 30 days. If one assumes that the cash flow is evenly spread over a month, an LCR of 60 per cent in Swedish kronor would mean, in rough terms, that a bank could meet its liquidity requirement in Swedish kronor for 18 days.

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

According to the Basel Accord and the European Commission's delegated Regulation 2015/61 on LCR, a currency that constitutes more than five per cent of a bank's total liabilities is considered to be a significant currency for that particular bank. The Basel Accord states that short-term liquidity risks in significant currencies should be monitored.

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 some important currencies are smaller. This means that the LCRs in euros and dollars are often much higher than the quantitative minimum requirements, while the ratios in certain other important currencies are often lower. All in all, this means that the LCR levels in other important currencies are sometimes way below 100 per cent (see chart 2:16). 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 very important for the banks to insure themselves against their short-term liquidity risks. The Riksbank therefore recommends that FI sets 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 (see chapter 2) and also limits the risk of contagion should one bank encounter liquidity problems.

This would mean that the banks need to increase their holdings of liquid assets in certain significant currencies, which also entails costs. According to the Riksbank's calculations, these costs are at present calculated to be around half a billion kronor on an annual basis. This is around half a per cent of the major banks' total annual profits.

New calculations provide support for the Riksbank's recommendation of a leverage ratio requirement of 5 per cent

To form an opinion of what would be a socioeconomically appropriate level for the banks' capital, the social benefit of higher capital levels needs to be balanced against the possible costs of these. Updated calculations made by the Riksbank illustrate what may be appropriate capital levels for Swedish banks. The calculations take account of the possibility that increased capital requirements may entail higher borrowing costs for households and companies which, in turn, may have a dampening effect on investments and GDP. This cost should be balanced against the fact that more capital in the banks decreases the probability of banking crises. Banking crises entail high socioeconomic costs, with falls in output in both the short and long terms.

The updated calculations indicate that a socioeconomically well-balanced level for the banks' leverage ratio is somewhere in the interval of 5–12 per cent. The result is in line with several other new international studies in the area. The calculations thereby provide support for the Riksbank's recommendation to FI to introduce a leverage ratio requirement of 5 per cent for major Swedish banks. The calculations also indicate that a requirement higher than 5 per cent may be appropriate.

However, a number of studies indicate that an excessively rapid increase of the capital level may entail a risk that the banks will restrict their lending to households and companies in the short term. To avoid such restrictions, it may be justifiable to raise the capital requirement gradually, so that the banks, little by little, can increase their equity with retained profits. It is also uncertain what effects the tightened capital requirements may have, which also argues for moving ahead cautiously so that the effects can be studied as they happen.

⁶⁹ The Basel Accord states that a bank shall have liquid assets that can meet the outflows in all significant currencies in which outflows can arise.

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 LCRs quarterly 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 therefore important for the major Swedish banks to report their LCRs in Swedish kronor and in all other significant currencies on a quarterly basis. The banks would in this way provide a clearer picture of their liquidity risks in different currencies. 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.

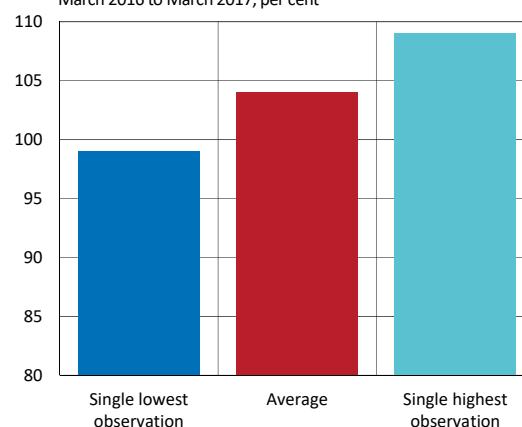
The major Swedish banks should continue to reduce their structural liquidity risks and achieve a Net Stable Funding Ratio (NSFR) of at least 100 per cent.

The NSFR is an internationally agreed measure that sets a minimum requirement for the level of structural liquidity risks that can be accepted for global banks. According to the Basel Committee's timetable, the banks will have to meet a minimum NSFR level of 100 per cent from 2018. The same minimum level is included as a proposal for a requirement in the European Commission's banking reform package. However, it is reasonable to assume that banks with a large share of wholesale funding, like the Swedish banks, already fulfil this requirement. During the period March 2016 – March 2017, the four major Swedish banks had, on average, an NSFR of 104 per cent, but the lowest values observed for individual banks during the same period indicate levels of less than 100 per cent (see chart 3:3).

The NSFR is a measurement that does not fully reflect the banks' structural liquidity risks. It does not give full consideration to the differences in maturities of their funding. The measurement thus makes no distinction between maturities that are just over one year and those that are, for example, five years, despite there being less of a liquidity risk associated with the latter. This means therefore that 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 considerable structural liquidity risks in a European perspective. 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. There may also be reasons to produce supplementary measurements to the NSFR, which better capture the banks' structural liquidity risks.⁷⁰

Chart 3:3. The major Swedish banks' lowest, average and highest monthly NSFRs

March 2016 to March 2017, per cent



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

⁷⁰ The major Swedish banks' structural liquidity risks, *Riksbank Studies*, November 2016. Sveriges Riksbank.

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

At present, Swedbank reports their NSFR in its public financial statements. In March 2017, Swedbank reported an NSFR of 109 per cent. 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 calls on the major banks to report the structural liquidity risks they take at maturities that are longer than one year; i.e. those risks that are not fully captured by the NSFR. This would increase understanding, among investors and other market participants, of the structural liquidity risks to which the banks are exposed.

ARTICLE – A cross-border banking sector with major assets and liabilities in foreign currency poses risks to financial stability

The banking sector in Sweden has significant assets and liabilities in foreign currency, in addition to Swedish kronor, and is thus vulnerable to liquidity risks. For banks to manage these risks, it is important that they insure themselves by holding liquid assets and ensuring stable funding also in foreign currency. It is also important that Swedish authorities are able to manage a situation of financial stress in which the banks' own liquidity buffers are not sufficient. The Riksbank maintains a foreign currency reserve to allow it to act rapidly in such a situation. The Riksbank considers that the liquidity requirement that may apply in a crisis means that the foreign currency reserve should not be smaller than it is today. The alternative to maintaining a foreign currency reserve is to acquire foreign currency when a crisis is imminent. However, it may be very expensive, difficult or even impossible to rapidly borrow as much currency as would be needed to avoid significant costs for society. The costs for that part of the foreign currency reserve that the Riksbank maintains to provide liquidity support should be transferred to the financial sector as the reserve has the character of an insurance policy. Such a solution has public finance advantages and creates a sound incentive among the banks to decrease their risks.

A country can have significant assets and liabilities in currencies other than its own. The central government, banking sector or private companies may be exposed to other countries' currencies. Among other things, such exposures entail liquidity risks in these other currencies. It is important that these risks are managed. This is particularly important in small, open economies that are strongly dependent on foreign trade, with large cross-border banking operations and without the same opportunities as countries with major trading currencies to issue debt instruments in their own currency on the international capital markets.⁷¹

The banks' liquidity risks in foreign currency

Sweden has a large banking sector with very extensive cross-border operations and significant assets and liabilities in foreign currency. The Swedish banking system's total assets amounted to SEK 17,250 billion in January 2017,⁷² which corresponds to four times Sweden's GDP. At the end of 2016, funding in foreign currency in the four major banking groups amounted to 175 per cent of GDP that is approximately SEK 8,000 billion. Part of the borrowing that was conducted in US dollars, euros and other currencies was converted using currency swaps to Swedish kronor and other Nordic currencies to fund assets in these currencies. In addition, borrowing in foreign currencies funds, to a certain extent,

assets in foreign currency that have significantly longer maturities than the funding has, for example mortgages, but also loans to non-financial corporations. The banks are thus exposed to the risk that their international financiers will be unwilling to renew the loans they have taken, at the same time as their assets in foreign currency will remain on the balance sheet. This could lead to liquidity problems for the banks. If the banks are unable to re-finance themselves, they may be forced to break off new lending and may find it difficult to fund their existing lending. This could lead to the banks' customers being impacted by liquidity problems, which, in turn, could lead to credit losses in the banks.

The size and structure of the Swedish financial system, with its extensive operations in currencies other than Swedish kronor, may thus entail significant risks for financial stability and, ultimately, for the economy as a whole. These risks concern not only the Swedish economy but also our neighbouring countries, where Swedish banks have operations. The Baltic and Nordic central banks also say that, if the major Swedish banks should encounter problems, this would also threaten the financial stability of their countries.⁷³ In its analysis of the financial sector in Sweden, the International Monetary Fund (IMF) also points out that the Swedish banks are important to these

⁷¹ Eichengreen, B., Hausmann, B. and Panizza, U. (2003), *The Pain of Original Sin*, University of Chicago Press.

⁷² This figure excludes Swedish banks' foreign-owned subsidiaries.

⁷³ *Financial Stability Review 2/2016*, Eesti Pank. *Financial Stability Report 2016*, Latvijas Banka. *Financial Stability Review 2016*, Lietuvos Banka and *Bulletin 2/2016*, Bank of Finland.

countries.⁷⁴ It is therefore of the utmost importance that the Swedish banks' liquidity risks are managed well.

The banks need to insure themselves

A natural starting point is that the banks, just like other private commercial actors, should manage their liquidity risks themselves. They therefore need to insure themselves by having enough liquidity reserves and sufficiently stable funding in foreign currency. In this way they can reduce the risk that the public sector will be forced to intervene and support them in the event of a crisis. Finansinspektionen (FI) has also already placed demands for how the banks should manage their liquidity risks, among other means by requiring specific liquidity cover ratios (LCRs) in euros and US dollars.⁷⁵ The Riksbank's assessment, however, is that the banks have insufficient resilience in other significant currencies and that further requirements are needed (see chapter 3).

The central bank as liquidity supplier

Even if the banks were to have robust self-insurance, it is not certain that this would be enough in crisis situations. It is therefore important that an authority has a function as 'lender of last resort', which is to say it has the capacity to provide the banking system with liquidity in the event its banks were finding it difficult to obtain funding on the market. In Sweden, the Riksbank has this role. However, the Riksbank's possibility of acting as 'lender of last resort' is not the same for foreign currency as it is for Swedish kronor. As regards its own currency, the central bank basically has an unlimited ability to create liquidity to provide to the banking system, even if this means that the central bank incurs a credit risk. But foreign currency must be acquired. This can either be done in advance by maintaining a foreign currency reserve, or by acquiring foreign exchange when the need arises. In Sweden, this is currently managed by the Riksbank holding a foreign currency reserve. In 2009 and 2012, the foreign currency reserve was strengthened by the Swedish National Debt Office taking loans in foreign currency on behalf of the Riksbank. The Riksbank can also borrow in its own name or buy foreign currency and pay with its own currency.

Necessary to have an adequate foreign currency reserve

One advantage of having a foreign currency reserve is that it is very liquid and can thus be made accessible for liquidity support to the banking system in periods of financial stress.⁷⁶ A foreign currency reserve can thus be regarded as a liquidity insurance that provides good

protection if a financial crisis arises. The Riksbank's foreign currency reserve was used, for instance, during the financial crisis 2008-2009 when Swedish banks were unable to attain sufficient dollar funding. In four weeks, the Riksbank lent US dollars equal to about SEK 200 billion. Good crisis preparedness presupposes that even larger amounts can be generated in an even shorter time-frame. A foreign currency reserve can also prevent a financial crisis by creating confidence in the central bank's ability to take action in a crisis.

Deterioration in confidence can have major consequences

Historical experiences show that a deterioration in confidence can have major consequences. For instance, Ireland's credit rating was cut substantially within the course of a couple of years in connection with the global financial crisis 2008-2009. In the central government budget, interest expenditure for central government borrowing increased from around 3 to over 10 per cent of GDP, which forced severe cuts to other public expenditure.

Another example is the developments in Iceland in connection with the financial crisis. Iceland's credit rating was also cut rapidly, and its currency depreciated substantially before trade in the Icelandic krona was finally stopped. At the same time, the Icelandic policy rate was raised to 18 per cent despite a floating currency. A government budget with a 5 per cent surplus in 2007 was transformed into a deficit of 13 per cent in 2008. Risk premiums for Iceland on the financial markets were high for a long time following the crisis, which illustrates how difficult it is to re-establish confidence once it has been damaged.

Swedish experiences also demonstrate that it takes a long time to regain confidence. The crisis suffered by Sweden in the early 1990s culminated in the country having to abandon the fixed exchange rate in 1992. The crisis also led to important reforms. Monetary policy received an inflation target, a new framework was introduced for public finances, and both the pensions and social insurance systems underwent fundamental reform. Nevertheless, interest rates in Sweden were considerably higher than in Germany for a long period of time, with a very high risk premium for a number of years.

All in all, experiences show that in times of financial stress the focus is on liquidity and the capacity to manage foreign debts in currency is extremely important. Protecting a country from the effects of financial unease requires

⁷⁴ *Sweden Financial System Stability Assessment*, November 2016. International Monetary Fund (IMF).

⁷⁵ See, among others, Short-term liquidity risks in significant currencies. *Financial Stability Report* 2016:2. Sveriges Riksbank.

⁷⁶ See, for instance, Goldberg, L. Hull, C. and Stein, S. (2013), *Do industrialized countries hold the right foreign exchange reserves?* Current issues, volume 19, number 1. Federal Reserve bank of New York, Ramaswamy, S. (1999), *Reserve currency allocation: an alternative methodology*. BIS Working paper nr 72 or IMF *Assessing Reserve Adequacy*, February 2011, International Monetary Fund (IMF).

both stable finances and rapid access to liquidity in other currencies. A sufficiently large foreign currency reserve can therefore be regarded as a robust insurance against liquidity risks. Given the Swedish financial system's large degree of international dependence, it is important and necessary to maintain international confidence in the financial system.

It may prove risky to acquire foreign currency in a crisis

The alternative to maintaining a foreign currency reserve is not to acquire foreign currency until a crisis has occurred or is imminent. However, it may be difficult to quickly borrow sufficiently large amounts once the crisis is unavoidable. Moreover, it may be considerably more expensive to borrow than compared with borrowing under normal circumstances. There is also a risk that the probability of suffering a crisis increases, as resilience and confidence abroad will become lower.

Even with well-functioning financial markets, extensive borrowing can take time in order to avoid influencing market rates too much. For instance, it took several months for Swedish authorities to borrow foreign currency to the extent needed during both the 1990s crisis and the most recent financial crisis.⁷⁷

Substantial and rapid borrowing when a crisis has actually occurred also risks pushing up the central government's borrowing costs. Furthermore, banks may need liquidity support in foreign currency at the same time as the central government has less financial strength and scope for borrowing on the capital markets and these two problems thereby risk reinforcing one another. Developments in Ireland and Iceland, for example, also show that banking crises have often coincided with sovereign debt crises and the combination has often proved particularly costly for the real economy.^{78, 79} A bank crisis can also undermine the state's credit rating as the state is expected to absorb losses or because the banking crisis is expected to lead to much worse growth in the real economy. The larger the banking system is in relation to the size of the state, the greater is its influence.

As rapid or unexpected borrowing causes interest rates to rise, the central bank's scope for creating impact for its monetary policy will also deteriorate. In a small, open economy with its own currency, severe exchange rate fluctuations can aggravate the problem. A well-balanced foreign currency reserve can instead inspire

confidence and counteract damaging speculations on the financial markets.

The cost of a foreign currency reserve – an insurance premium that should be paid by the financial sector

The cost, or insurance premium, of having a liquidity insurance in the form of a foreign currency reserve is at present charged to the Riksbank's earnings and central government finances and is calculated at around SEK 500 million a year.⁸⁰ In comparison, it can be mentioned that the recently proposed increase in the resolution fee entails increases for the banks of SEK 3,5 billion a year.

To create sound incentives for the banks to reduce their liquidity risks in foreign currency, it is important that the insurance is paid for by those benefiting from it. Above all, a confidence-inspiring currency reserve benefits the financial sector, primarily the major Swedish banking groups. Sweden's good public finance situation, combined with the Riksbank's currency reserve, means that the risk premium when the banks are obtaining funding on the international capital markets is lower than it would otherwise have been.

One could consider a number of different ways of transferring the cost for the part of the foreign currency reserve held by the Riksbank to be able to give liquidity support to the banks. Their common characteristic is that they all aim both to cover the cost of maintaining a currency reserve and to give the banks an incentive to reduce their liquidity risks in foreign currency.

Once conceivable model is based on a fee system, where the fee paid by a bank is proportionate to the liquidity risks in foreign currency taken by that bank – the greater the risk, the higher the fee. Another model is that the Riksbank is granted the legal conditions to introduce a reserve requirement in foreign currency aimed at promoting a safe and efficient payment system. Such a requirement would mean that a part of the banks' borrowing in foreign currency would have to be deposited in the Riksbank, where it would be available for use by the bank in the event of a financial crisis. Such a solution would mean in principle that the liquidity coverage requirements for the banks would not be needed if their reserve requirements were sufficiently large. A minimum reserve in Swedish krona could also be used for this purpose, to give the banks an incentive to reduce their risks and at the same time cover the costs of the foreign currency reserve.

⁷⁷ Consultation response to the proposal referred to the Council on Legislation regarding the Riksbank's financial independence and balance sheet, May 2017. Sveriges Riksbank.

⁷⁸ Reinhart, C. and Rogoff, K (2011), From Financial Crash to Debt Crisis, *American Economic Review* 101.

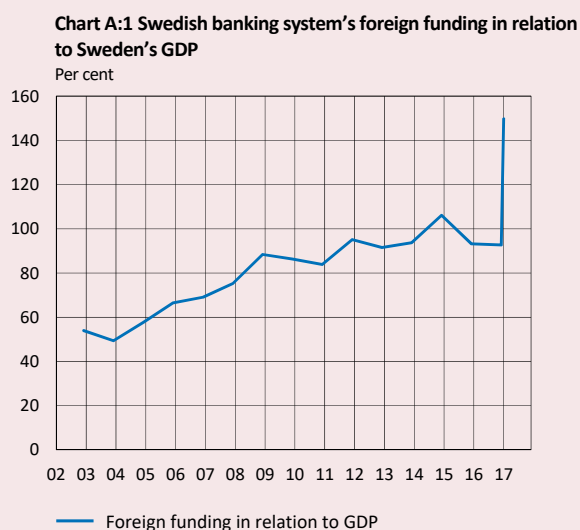
⁷⁹ de Paoli, B., Hoggarth, G and Saporta, V (2009), Output Costs of Sovereign Crisis: Some Empirical Estimates, *Working paper No. 362*. Bank of England.

⁸⁰ This is an estimate for a particular year, but an assessment of the cost should be made over a longer period, as the costs (and the revenues) have varied considerably over time. The funding cost of the borrowed part of the currency reserve is reduced by funds being invested in interest-bearing assets. The way that funds are invested and the development of the market affect the net result of the pre-financed currency reserve.

An appropriate size of the Riksbank's currency reserve

An analysis is needed of the risks that the currency reserve is intended to cope with in order to assess an appropriate size of it. The Swedish banks' foreign funding as a share of GDP has tripled since the beginning of the 2000s up until the present day, and currently amounts to 150 per cent of GDP (see chart A:1). The substantial increase in the banking system's foreign funding at the turn of the year 2016/2017 is mainly due to Nordea's transformation into a branch structure, when the legal domicile of some funding in foreign currency was moved to Sweden. At the same time, it should be pointed out that additional funding in foreign currency remains in the major Swedish banks' foreign subsidiaries, including in Nordea's mortgage lending companies in Denmark, Norway and Finland.⁸¹

There is a risk that the Swedish banking system's access to foreign funding can deteriorate under financial stress. An important base for assessing what is a sufficient foreign currency reserve is therefore an analysis of the Swedish banking system's refinancing requirement in different scenarios. In this way, one can estimate the banking system's potential requirement of liquidity assistance in foreign currency from the foreign currency reserve. The Riksbank has therefore made scenario analyses based on data reported by banks to Sweden's financial supervisory authority, FI. Different assumptions



Note. Foreign funding refers to Swedish banks' (including Swedish subsidiaries but excluding foreign subsidiaries) market funding and deposits in foreign currency. Last data point refers to January 2017. The heavy increase at the start of 2017 is due to Nordea's previous foreign banking subsidiaries being incorporated into the Swedish parent company.

Source: Statistics Sweden

are then made regarding the maturity structure of the banks' lending and their funding, regarding how much of the banks' own liquidity reserves is available to meet the foreign currency outflows and regarding how long the crisis will last.

Assumptions in the base scenario

The Riksbank has defined a base scenario for a feasible crisis based on historical experiences of the in- and outflows of foreign currency and the use of liquid assets under stress. The assumptions made in the base scenario include:

- A fall in banks' deposits in foreign currency from households of 5 per cent and from companies of 25 per cent.
- The banks' lending remains unchanged, that is, there is no credit crunch for borrowers.
- The financial markets for securities funding are not available to Swedish banks.
- Only central bank money and government securities can be used to generate liquidity on capital markets; covered bonds, corporate bonds and other assets are assumed to be illiquid on private markets.
- The banks allow their liquidity buffers to fall to 75 per cent of the requirement. This means that banks do not dispose of or pledge all their most liquid assets in foreign currency to counter the currency outflows.⁸²
- The scenario runs for three months.
- Holdings of US dollars and euro can be interconverted or converted to less liquid currencies such as DKK, NOK and GBP.
- Assets in domestic currency that are funded in foreign currency in the form of currency swaps can, if necessary, be replaced by funding in domestic currency.

The requirement amounts to SEK 535 billion

With these assumptions the banking system's need for liquidity assistance from the Riksbank's foreign currency reserve can be estimated at corresponding to SEK 535 billion over a three-month period. In comparison, it can be noted that the Riksbank's actual foreign currency reserve amounted to SEK 470 billion at the start of 2017. The International Monetary Fund (IMF) has made similar calculations and come to the conclusion that Sweden's foreign currency reserve should not be less than it is today.⁸³ In its latest global stability report, the IMF also points out a growing concern about the fact that non-US banks are increasing their dependence on funding in US

⁸¹ If the major banks' foreign-owned subsidiaries are also included, foreign funding would amount to 175 per cent of GDP.

⁸² There may be several reasons why the banks either cannot or do not want to empty their own reserves before seeking assistance from the Riksbank. For one thing, collateral may be needed to implement intraday payments, and for another thing

liquidity reserves that are too low may undermine confidence that the bank can recover.

⁸³ *Article IV consultation with Sweden concluding statement of the IMF mission*, September 2016. International Monetary Fund (IMF).

dollars.⁸⁴ In the report, the IMF calls on countries with limited foreign currency reserves and a lack of swap lines with other central banks, like Sweden, to consider measures aimed at strengthening their resilience.

The above analyses consider neither the monetary policy arguments in favour of maintaining a foreign currency reserve nor the commitments made by the Riksbank in relation to the IMF and other international organisations or central banks.

Sensitivity analysis – summary

The uncertainty in these calculations is considerable and the calculations are also sensitive to different assumptions. With different assumptions, the currency need may be considerably larger or smaller. A brief sensitivity analysis is presented below.

Table A:1 and the accompanying sensitivity analysis illustrate how the amounts are affected when the assumptions change. As the banks' liabilities in foreign currency are so large, even small changes in the underlying assumptions can have a major effect on the currency requirement, both in absolute terms and in relation to the size of the currency reserve.

Some of the assumptions concern factors that neither the banks nor the financial supervisory authorities can affect (how liquid the banks' assets are under stress and the size of the outflows from households and companies). Other assumptions are mainly dependent on the banks' behaviour in times of stress (to what extent they choose to use their liquidity buffers and to what extent they renew loans that mature). But the financial supervisory authority can affect the degree of self-insurance needed in the banking system by regulation and choice of risk tolerance, which affects the potential liquidity requirement of the banking system. Swedish authorities have influenced, for instance, the Swedish banking system's potential liquidity requirement in dollars and euros as FI has made a conservative choice to introduce liquidity coverage ratios (LCR) in these currencies. At the same time, the sensitivity analysis shows that the liquidity

Table A:1 Liquidity requirement during three-months' financial stress
SEK billion

Liquidity reserve falls to	More liquid assets	10% credit crunch	Base scenario	Larger outflows: -15% household deposits	Larger outflows: -40% company deposits
75%	362	478	535	691	845
50%	189	219	263	354	489

Note. In the base scenario, the banks choose not to allow their liquidity buffers to fall below 75 per cent of the requirement. If banks allow the utilisation rate to fall to 50 per cent, the liquidity requirement decreases.

Source: The Riksbank

Sensitivity analysis - liquidity requirement

This box describes how the liquidity requirement is affected when the assumptions used in the base scenario are changed. The results are summarised in table A:1.

More liquid assets (SEK 362 billion)

In the base scenario, it is assumed that it is only the banks' central bank money and government securities that can be used to generate liquidity. But if the banks' other liquid assets (e.g. covered bonds) are also included, their liquidity requirement falls to SEK 362 billion.

10 per cent credit tightening (SEK 478 billion)

In the base scenario, it is assumed that the banks' balance sheets will be retained, that is, all new lending to the general public will stop and all existing lending will be renewed on an ongoing basis. But if only 90 per cent (instead of 100 per cent) of the loans that mature within three months are renewed, the banks' liquidity requirements will decrease by around SEK 50 billion, compared to the base scenario.

Larger outflows (SEK 691 and 845 billion respectively)

The base scenario assumes that 5 per cent of household deposits and 25 per cent of company deposits are withdrawn. If withdrawals instead amount to 15 and 40 per cent respectively, banks' liquidity requirements will increase by SEK 100–300 billion compared to the base scenario.

Convertibility (SEK 740 billion)

In the analysis, it is assumed that full convertibility prevails, i.e. that US dollars and euros can always be converted to less liquid currencies such as NOK, DKK and GBP. If convertibility does not prevail, it means that the Riksbank may need to step in and provide liquidity support in these currencies. If this were to be the case, the need for a currency reserve increases, all other factors being equal, from SEK 535 billion to SEK 740 billion (this part of the sensitivity analysis is not included in table A:1). The majority of this increase is due to the exposure to NOK, followed by DKK, while the effect of the exposure to GBP is relatively minor compared with the effect of the two Nordic currencies.

The banks allow their liquidity reserves to fall to 50 per cent of the requirement

If the banks allow their own currency buffers to be reduced to 50 per cent, instead of 75 per cent as in the base scenario, before they assess that they need central bank support, this will halve their liquidity requirement. If the market finds out that the banks' own holdings of eligible assets in foreign currency have fallen below certain levels, there will be a risk that the market will consider that the bank in question is no longer an acceptable counterparty. In addition to this, the banks will need a certain amount of eligible assets to be able to execute payments and manage intraday liquidity. It is not possible to determine in advance what is the bank's lowest critical limit for a liquidity

⁸⁴ *Global Financial Stability Report*, April 2017, International Monetary Fund (IMF).

reserve before requesting central bank liquidity. But on the basis of discussions with the banks and with the IMF, it appears reasonable to assume that the critical limit lies above 50 per cent, although it is impossible to state an exact figure. One way of ensuring that the buffers do not fall too far below the levels required by the supervisory authorities is for the banks to maintain extra buffers beyond the regulatory requirements. It can be added that, if they find themselves in a situation of liquidity-affecting stress, the banks do not need to comply with the LCR requirements. However, a bank that considers itself to be in such a situation is to immediately inform FI of this, in writing, stating the reason.

requirement increases substantially (from SEK 535 billion to SEK 740 billion, see the box) if it is not possible in a stressed situation to convert dollars or euros to the smaller currencies such as Norwegian and Danish kroner. If the banks' liquidity buffers in the smaller currencies had been larger, the liquidity requirement in this scenario would have been smaller as non-convertibility would not have been a major problem. This is thus an example of how a higher degree of self-insurance reduces the need for a large foreign currency reserve.

Proposal to change the conditions for the foreign currency reserve

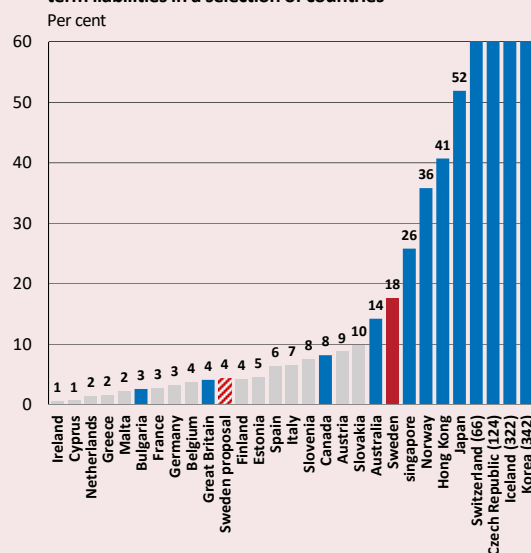
The Ministry of Finance has presented, on behalf of the Riksdag, a draft referral to the Council on Legislation regarding the Riksbank's financial independence.⁸⁵ The proposal involves significant limitations to the Riksbank's ability to fund the foreign currency reserve via loans from the Swedish National Debt Office. According to the proposal, the Riksbank shall also repay its debt, invested in the foreign currency reserve, to the Swedish National Debt Office by the end of 2017. If the Riksbank repays its loans from the Swedish National Debt Office, this may entail a reduction of the foreign currency reserve by an amount equivalent to SEK 257 billion. This means that in the short-term, it would be less than half the current size of around SEK 470 billion. According to the proposal, the Riksbank would be able to reinforce the foreign currency reserve in the future through loans from the Swedish National Debt Office of SEK 50 billion, if the Executive Board of the Riksbank considered there to be "exceptional grounds" for this. It is proposed that further reinforcement of the foreign currency reserve through the Swedish National Debt Office shall require a decision by the Riksdag and can only be done if the Riksdag considers there to be "exceptional grounds". According to the proposal,

"exceptional grounds" means that Sweden is entering a financial crisis.

The proposal was put forward at the same time as Nordea adopted a branch structure for large parts of its operations in Sweden's neighbouring countries. As was mentioned above, the transformation to a branch structure means that large volumes of foreign loans and their funding will find a legal domicile in Sweden. This will double Swedish participants' short-term funding in foreign currency. The Swedish banking system, including Nordea, accounts for more than 90 per cent of these loans while the Swedish government and Swedish non-financial corporations account for the rest. At the same time, as has been described above, legislation is being proposed that could result in the foreign currency reserve basically being halved in the short term. If the proposal is accepted, it will mean all in all that the foreign currency reserve will decline in relation to Swedish borrowers' short-term liabilities from 18 per cent in 2016 to 4 per cent at the end of 2017 (see chart A:2). All in all, this can entail increased risks in the Swedish financial system.

According to the proposal, the Riksbank shall thus repay its debt to the Swedish National Debt Office. For the Riksbank to have an appropriate composition of the currency reserve, the Riksbank would need to perform extensive transactions aimed at restoring the original composition. Such a rapid transformation is costly and risks creating market disturbances. Both the Swedish National Debt Office and FI take up the practical problems

Chart A:2 Foreign currency reserve in relation to short-term liabilities in a selection of countries



Note. Countries with grey columns are in the EMU. Sweden prior to and after Nordea's transformation into a branch structure and with Ministry of Finance proposals concerning to the foreign currency reserve.

Sources: Haver analytics, IMF and the Riksbank

⁸⁵ Draft proposal *The Riksbank's financial independence and balance sheet*, March 2017. Ministry of Finance.

and risks of substantial costs entailed in the current wording of the proposal in their consultation responses. An alternative and better way that repaying the debt directly is to allow the funds to remain in the Riksbank's balance sheet and then repay the debt when the assets mature.

Consequently, the Riksbank does not support the draft consultation response's proposal to limit the Riksbank's scope for borrowing foreign currency via the Swedish National Debt Office. Even if the Riksbank is able to fund the currency reserve in its own name, the most cost-efficient solution is for the Swedish National Debt Office to continue to borrow on behalf of the Riksbank. It is reasonable for the Riksbank not to have the right to unlimitedly and unilaterally decide on borrowing from the Swedish National Debt Office. The current arrangements, which mean that the Swedish National Debt Office must, within its mandate, make a government debt policy trade-off prior to a decision on borrowing to the Riksbank, should be clarified in the legislative text.

ARTICLE – Commercial properties and financial stability

The commercial property sector, both in Sweden and abroad, has often played a significant role in larger financial crises. This is due both to the sector being large and sensitive to business cycles and to the companies in the sector having a large proportion of borrowed capital, which makes them important for the financial system. The major Swedish banks have significant lending to commercial property companies and a large proportion of it has commercial property as collateral. In other words, the banks are affected by developments both among property companies and on the commercial property market. The strong economic development in recent years and low interest rates have helped to push up prices on the Swedish commercial property market. As property prices have risen, property companies have also increased their liabilities both via bank loans and wholesale funding. Price developments can largely be explained by fundamental factors, but the assessment is that there may be risks as these factors can change rapidly.

Why is commercial property important for financial stability?

Commercial property, both in Sweden and abroad, has often played a significant role in larger financial crises.⁸⁶ During the crisis in Sweden in the 1990s, problems in the commercial property sector contributed to major loan credit losses and difficulties for the Swedish banking system. There are also international examples of how problems associated with the commercial property market exacerbated the financial crisis of 2007–2008.⁸⁷ This was not the case in Sweden, however.

The commercial property sector is large; the value of Swedish commercial property amounts to about SEK 1,765 billion,⁸⁸ about 40 per cent of Sweden's GDP. At the same time, it is a capital-intensive industry, the companies often have a large proportion of borrowed capital, both bank loans and wholesale funding. This means that they are exposed to interest rate and refinancing risks and thus potentially sensitive to rising interest rates. Altogether, this makes the sector important for the Swedish financial system.

The major Swedish banks have significant lending directly to commercial property companies and thereby considerable exposure to the sector. In a situation with plunging rents and property prices, there will be a risk that property companies cannot repay their loans. This involves a credit risk for the banks. Lending for commercial property differs in this respect from lending to, for example, households for housing purposes as households are personally liable for their loans, whereas as a rule commercial property companies in the form of limited liability companies borrow for commercial property purposes. If the property company cannot pay, the bank

therefore risks not being able to recuperate the money it has lent as the company may be declared bankrupt.

Wholesale funding is also linked to financial stability. In a situation where property prices fall, it may become more expensive and more difficult to obtain funding on the market, which would have a direct impact on property companies. If securities issued by commercial property companies make up a major part of the total outstanding volumes of the certificates and bonds issued by non-financial corporations, there is also a risk that companies in other sectors may encounter funding problems.

If both property prices and property companies' debt-servicing ability were to fall, it may also affect bank lending in general and hence macroeconomic development. If, for example, banks were to have a large number of problem loans on their balance sheets, it could lead to them being more restrictive in their lending to others, which could have knock-on effects on macroeconomic development. This could exacerbate an economic downturn.

Below follows a review of the latest developments in the Swedish commercial property sector and the risks linked to it.

High level of activity on the commercial property market

Growth in the commercial property market is currently strong. Activity, measured in terms of transaction volumes, is high. The economic terms and conditions on the market are good and are contributing to the high level of activity. The development has, for example, helped to

⁸⁶ See, for example, *The Riksbank's inquiry into risks on the Swedish housing market*, April 2011. Sveriges Riksbank, and *The State was dealt a bad hand – a report on housing finance in 1985–1993*, Ds 2002:9.

⁸⁷ See for instance *Report on commercial real estate and financial stability in the EU*, December 2011. European Systemic Risk Board.

⁸⁸ This is based on Fastighetsvärlden's list of the 100 largest commercial property companies in its 2016 Property Indicator. The calculation only includes corporate ownership in Sweden. The majority of properties for own use, such as Ikea's and Volvo's properties, are excluded. Part-owned property companies are reported as independent units if the holding is less than 50 per cent.

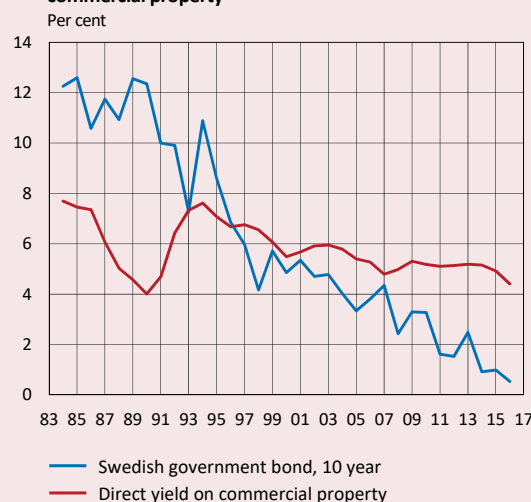
push down vacancy rates⁸⁹ and push up rents. It also means that property companies have good profitability and debt-servicing ability. At the same time, the low interest rates have led to lower funding costs and direct yield requirements (see chart A:3).⁹⁰

Together, these factors have contributed to rising commercial property prices, which are currently at levels similar to those in the run-up to the crisis of the 1990s. In real terms, i.e. excluding the direct effect of inflation, current price levels are not as high as then (see chart A:4). But they are on the same level as during the IT bubble around the turn of the millennium, and it is worth noting the development of clearly rising prices that has occurred recently. Over the last two years, property prices have grown by about 9 per cent a year and most of the market participants who took part in the Riksbank's risk surveys in 2016⁹¹ expressed unease about over-valuations on the Swedish commercial property market.

Direct yield on property investments is currently low at the same time as prices are rising, which historically has been an indicator of future price falls. The direct yield requirements of investors are affected by the risk-free interest rate, partly because it influences both how much compensation they want for investing in property, and the costs to investors of funding their investments. One explanation why direct yield requirements are currently low seen in a historical perspective is hence because the risk-free interest rate is also low. The difference between the direct yield requirements of investors on property and the risk-free interest rate, the so-called risk premium that investors want in order to invest in property instead of the risk-free alternative, is, on the other hand, high in a historical perspective (see chart A:3). This has not been the case in earlier periods of low direct yield followed by a price fall.

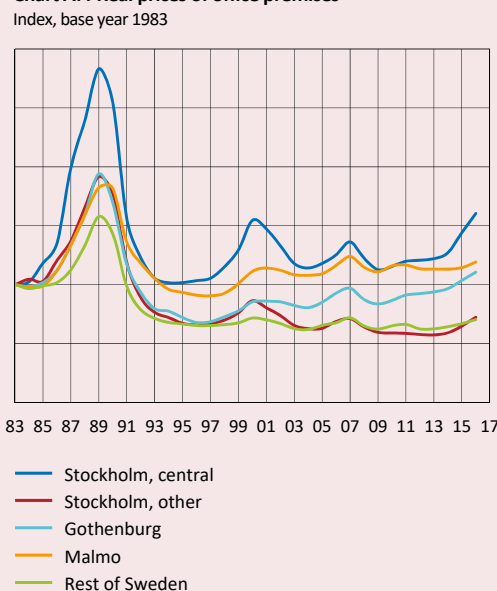
The strong economic development, together with the low interest rates, means that the currently rising commercial property prices can to a certain extent be justified based on fundamental factors such as high rent levels, low vacancy rates and low funding costs. It is important to remember, however, that such factors can change quickly. The ever-higher risk premium for investing in commercial property can, however, indicate that property companies are taking this into account to a certain extent.

Chart A:3 Risk-free interest rate and direct yield on commercial property



Source: MSCI

Chart A:4 Real prices of office premises



Note. The chart is based on a nominal price index which has been made real with the help of CPI inflation.

Sources: Statistics Sweden and the Riksbank

Capital-intensive industry with a large proportion of borrowed capital

The commercial property sector is an industry in which a lot of capital is required in order to run a business. Expressed in simplified terms, property companies can fund their business with equity capital or borrowed capital.⁹² They utilise borrowed capital to a large extent. For Swedish property companies listed on the stock ex-

⁸⁹ The vacancy rate is measured as the percentage of vacant premises in the property stock.

⁹⁰ The direct yield requirement is a measure of the returns that investors require from a property investment. For commercial property, the direct yield requirement is calculated as the difference between rental income and operating and maintenance costs for a property or property company, in relation to the price an investor has paid for the property.

⁹¹ *Market participants' views on risks and the functioning of the Swedish fixed-income and foreign exchange markets*, spring 2016 and autumn 2016. Sveriges Riksbank. The issue of how participants view the commercial property market was not included in the spring 2017 risk survey.

⁹² Commercial property companies with links to central government, municipalities and pension or life insurance companies are largely excluded from this analysis as their funding structure often differs from that of privately operated companies.

change⁹³, equity capital makes up just over 35 per cent of the funding while borrowed capital makes up 65 per cent. Other types of company listed on Nasdaq OMX generally have the converse ratio, i.e. 65 per cent equity capital and 35 per cent borrowed capital.

Whereas the balance sheet items borrowed capital, equity capital and assets have increased proportionally in recent years, the ratios of equity capital and borrowed capital in relation to assets have been relatively constant (see chart A:5). One explanation for the increase in all balance sheet items is a rise in the number of listed companies on the stock market in Sweden, although there are several other reasons as well. The fact that assets have increased is due, for example, to the value of the other companies' assets having risen at pace with nominal commercial property prices.

The fact that equity capital has increased is partly due to profitability among commercial property companies, measured as return on equity, having risen in recent years to levels that are high in a historical perspective and that many companies have chosen not to distribute all the profit to shareholders. In addition, some companies have carried out new share issue aimed at increasing equity capital. Their borrowed capital has increased at the same time.

As regards borrowed capital, a review of the largest commercial property companies' annual reports performed by the Riksbank shows that it consists of both bank loans and wholesale funding to a varying degree.⁹⁴ On average, however, bank loans and wholesale funding are more or less equally common. In recent years, companies have both borrowed more from banks and increased their wholesale funding.

The fact that property companies have a larger share of borrowed capital than companies in many other sectors is not unusual since, when taking bank loans, property companies often leave property as collateral for the loan which reduces the risks for the bank compared to loans without collateral. The large proportion of borrowed capital, however, means that the commercial property sector is interconnected with the financial system and, from a financial stability perspective, it is therefore important to understand this interconnection and how it has developed. Therefore, a review of property companies' borrowed capital follows below.

Loans from banks increasing

In the autumn of 2016, the Riksbank conducted a survey aimed at obtaining more information about commercial property companies' bank loans. Questions were put to the four major Swedish banks. The survey showed that their lending to Swedish commercial property companies has increased by almost SEK 100 billion since 2010 and now amounts to SEK 456 billion (see chart A:6 and table A:3).⁹⁵ The rate of increase is approximately in line with the banks' total lending. This lending is hence responsible for just over a third of banks' lending to Swedish non-financial corporations.

In addition to actual lending, the banks also have pledged unutilised loan limits or loan commitments to commercial companies for an additional SEK 87 billion, which is almost 20 per cent of the existing lending to these companies. Furthermore, property companies often have unutilised credit and liquidity facilities at the banks that are earmarked for covering the funding of their outstanding certificates.

Property companies have also increased their wholesale funding

Since 2013, property companies have increased their wholesale funding by issuing more bonds and certificates. The outstanding volumes have more than doubled over the last four years, from SEK 112 billion in early 2013 to SEK 267 billion today, broken down into SEK 192 billion in bonds and SEK 75 billion in certificates (see table A:3). This is not only because the companies have increased their borrowing but also because the number of property companies that use this type of funding has also risen. But other non-financial corporations have not increased their use of this type of funding to the same extent. This has resulted in commercial companies' share of total outstanding volumes having increased: from 18 per cent in March 2013 to 31 per cent at the start of 2017.

There are no specific statistics on which agents invest in the wholesale funding of property companies. Statistics Sweden does, however, compile statistics on which agents invest in the funding of non-financial corporations and because property companies are responsible for just over a third of the outstanding volumes within this category, the statistics can give a rough picture of who the investors in property companies are. The statistics show that just over half the investments come from abroad (52 per cent). Among Swedish investors, investment funds

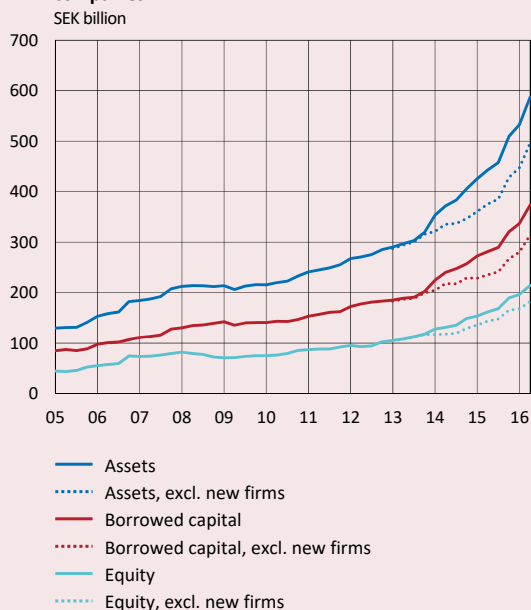
⁹³ The listed companies in the sample have assets amounting to SEK 610 billion. This is equal to just over a third of the commercial property sector's total assets based on the 100 largest companies from the Fastighetsvärlden list in the 2016 Property Indicator.

⁹⁴ The borrowed capital also consists to a certain extent of other types of funding such as internal loans, accounts payable and deferred tax liabilities. These have been excluded in the review. As regards tax liabilities, the Ministry of Finance is currently

investigating certain issues in the property and stamp tax area. Depending on whether and how a change is made within these areas, it may affect property companies and possibly the commercial property market, see *Vissa frågor inom fastighets- och stämpelskatteområdet* [Certain issues in the property and stamp duty area], SOU 2017:27. Swedish Government Official Reports.

⁹⁵ Refers to the banks' lending to commercial property companies excluding housing properties.

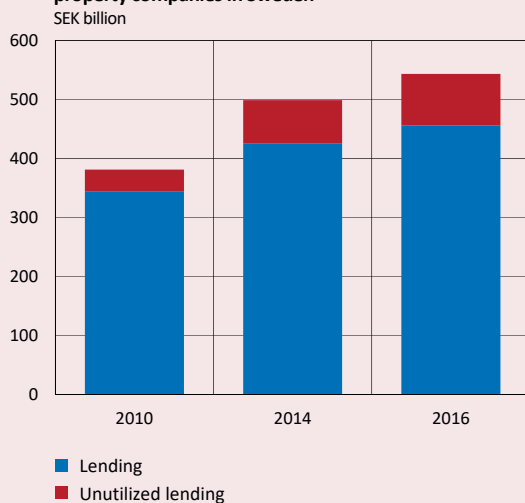
Chart A:5 Real balance sheet items for listed property companies
SEK billion



Note. The chart is based on a nominal data which has been made real with the help of CPIF inflation.

Sources: Bloomberg and the Riksbank

Chart A:6 Major Swedish banks' lending to commercial property companies in Sweden
SEK billion



Note. Refers to the banks' lending to commercial property companies excluding housing properties.

Source: The Riksbank's survey

constitute the single largest investor category (13 per cent) followed by pension and insurance companies (9 per cent).

No marked change in interest rate and refinancing risks...

As property companies have a significant share of bank loans and wholesale funding, they can be exposed to interest rate and refinancing risks.⁹⁶ However, it is unclear

exactly how great these risks are. Normally, property companies borrow at variable interest rates. At the same time, they often enter into derivative agreements, which convert the variable interest expenditure to a fixed rate, in order to reduce the effects that changed market rates may have on their funding costs. This is also something that three out of the four banks in the survey require the companies to do to a certain extent in order to be able to borrow. The proportion of bonds issued at a variable interest rate has decreased in recent years, however, and the banks also say that they have noted that companies choose to take an increasingly large share of their funding at a fixed rate. This suggests that the interest rate risk on the liabilities has decreased slightly.

The average maturity for the companies' outstanding bonds is about four years and has not changed in recent years. Other non-financial corporations have had an average maturity of about six years in recent years. As regards bank loans, two out of four banks state that the maturity for property companies' loans has been decreasing since 2010, while the other two banks say it is un-changed. It is difficult to say anything about the refinancing risk with any certainty based only on this information, but it suggests that the risk has more or less remained unchanged in recent years.

... but companies' profitability is sensitive to interest rate changes

Even if the interest rate risk is deemed to have decreased slightly for property companies, their increased liabilities mean that they are still markedly exposed to rising interest rates. One way of studying companies' sensitivity to interest rates is to analyse their interest coverage ratios, which show how the revenue of large companies is in relation to their interest expenditure. For property companies, the average interest coverage ratio is currently around three, which means that their revenue is three times greater than their interest expenditure.

Such a low ratio as three can pose a risk as interest rates are currently at historically low levels. Unless something else happens, the interest coverage ratio will fall when interest rates rise and vice versa. In a stress test, the Riksbank has studied how property companies can be affected by sharply rising interest rates. This could happen if, for example, confidence in the entire commercial property sector were to wane. This could also happen if the Swedish economy were to be hit by sharply rising inflation. In the test, it is assumed that the variable rates for commercial property companies funding rise from 1.7 to 5.0 per cent in the short term. In addition, various assumptions are made as to how much of the rate in-

⁹⁶ Interest rate risk is the risk of the value of financial assets and liabilities changing when market rates rise or fall. Refinancing risk is the risk of funding opportunities

being restricted when loans are to be converted and of payment commitments not being fulfilled as a consequence of inadequate liquidity.

crease has an impact on the companies' funding costs and whether revenue is also affected and if so, to what extent (see table A:2).

Table A:2 Stress test of property companies' interest coverage ratios

Scenario	Impact from rate rise	Change revenue	Interest coverage ratio
Current situation	-	-	3.33
Scenario 1	50%	-	1.89
Scenario 2	50%	-25%	1.42
Scenario 3	100%	-	1.32
Scenario 4	100%	-25%	0.99

Note. The calculations in the stress test are based on data for Swedish commercial property companies listed on the stock exchange.

Sources: Bloomberg and the Riksbank

The results of the stress test show that the interest coverage ratio falls towards a value of one in all scenarios, albeit to a varying extent. This implies that the size of the companies' revenues approaches the size of their interest expenditure, which, all other factors being equal, means that their profitability gradually deteriorates. In scenario 4, it is assumed that the entire rate increase has an impact on all the property companies' funding and that revenues fall by 25 per cent at the same time. In this scenario, the interest coverage ratio falls below one, which means that interest expenditure exceeds revenue. This means that the companies make a loss, unless property values increase to exceed the deficit that arises as a result of interest expenditure being greater than revenue. If property companies start to make a loss, it may also affect banks' and investors' willingness to lend money to them, both in the form of equity capital and debt financing.

The stress test is based on the assumption that the variable interest rate for the commercial property companies' funding rises sharply in the near term. If the corresponding rate rise were instead to occur gradually over a number of years, the effect on property companies' interest coverage ratios might be entirely different. This may happen if the economy strengthens gradually. The impact from the rate rise on property companies' funding costs will then gradually increase as they have to renew the outstanding debt that matures with new funding at a higher interest rate, and the rate rise would gradually have a full impact on the companies' funding costs.

At the same time, it is reasonable to assume that the rental income of the property companies would also gradually increase in this scenario. The interest coverage ratio will thereby be less affected. Furthermore, their scope for obtaining new loans should not be affected to any great extent.

Problems in the property sector may have tangible effects on banks

As described earlier, Swedish banks are exposed to commercial property companies in different ways. The main exposure comes from the considerable amount of money banks lend to them. Most of this lending is secured and for the majority of it property mortgage deeds have been submitted as collateral.

In the Riksbank's survey, the banks state that they changed their credit policies in the wake of the crisis in the 1990s and started focusing on cashflows and direct yield requirement instead of the market value of the property, which was the case previously. By doing this, they consider themselves less vulnerable to changes in the market value of the loan collateral, i.e. the properties. The value of the property is still an important factor when it comes to lending, however; the most common so-called "covenant", a type of condition that is to be fulfilled during the loan's maturity, is, for example, a maximum loan-to-value ratio that sets the loan in relation to the value of the property.

As previously mentioned, bank lending to property companies amounts to SEK 456 billion. This can be put in relation to banks' Common Equity Tier 1 capital⁹⁷ of SEK 555 billion and shows that lending to property companies amounts to 82 per cent of the banks' capital. It is true that banks often have collateral for the loans, but the size of their exposure to property companies nevertheless indicates that they may be very negatively affected in the event of extensive losses on loans to commercial property companies.

Table A:3 Commercial property companies' funding

Commercial property company	SEK billion
Bank loans	455.9
(Unutilised loan limits)	(87.5)
Certificates outstanding	74.9
Bonds outstanding	191.9
Maturing certificates 1 month	18.9
Maturing certificates 3 month	58.0

Note. Any loans that Swedish commercial property companies have from foreign banks are not included in the statistics.

Sources: Macrobond, the Riksbank's bank survey, Statistics Sweden and the Riksbank.

In a situation where, for example, commercial property prices fall, it may be difficult for the banks to reduce their exposure to the sector, on the contrary, they may instead risk being even more exposed. If the property companies start to contravene the banks' covenants, or if the banks suspect that they are about to do so, they can take various measures depending on the circumstances. The measures can be anything from the banks demanding the terms of the loans be renegotiated or demanding

⁹⁷ Common Equity Tier 1 is 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).

additional collateral, to them requesting the loan be repaid prematurely.

If the property company cannot pay, the bank therefore risks not being able to recuperate the money and may instead have to sell the property that has been left as collateral for the loan.

In the worst-case scenario, the value of the property is less than the loan amount, which leads to a credit loss for the bank. If, in such a situation, the bank forces properties on to the market for sale, it may create a negative spiral of further falling property prices and even larger loan credit losses. If the banks instead choose not to force-sell the property and instead take a different measure, they may be able to dampen the negative price development on the property market.

In addition to direct loans, banks are also exposed to property companies in that they provide them with so-called credit or liquidity facilities as a kind of guarantee in certain cases when the companies cannot renew their outstanding certificates on the market.⁹⁸ Currently, property companies have certificate funding that matures within one month to a value of SEK 19 billion and within three months to a value of SEK 58 billion (see table A:3).

The banks do say that the companies cannot borrow unconditionally via the credit and liquidity facilities, but depending on the reason why the property companies has difficulty renewing outstanding certificate funding, the facilities can nevertheless increase the banks' exposure to the property companies. Many property companies demand that the size of these facilities at any given time be equal to the size of their certificate funding, which has increased significantly in recent years.

In a situation where property companies themselves have problems, it is doubtful whether they fulfil the conditions that give them access to credit and liquidity facilities.

In conjunction with the financial crisis, both the Riksbank and the Federal Reserve took measures to improve liquidity on the certificates market for non-financial corporations. This was done because the companies were finding it difficult to renew outstanding certificate funding that matured.⁹⁹ It is not certain that property companies' credit and liquidity facilities are sufficient to enable them to avoid possible funding problems.

Even in a situation where the property companies may not utilise the credit facilities, despite them having difficulty renewing outstanding funding, the banks can be affected by indirect exposures. As previously mentioned,

the property companies' total outstanding volume of wholesale funding amounts to SEK 267 billion. If the banks already have ordinary lending to property companies, they may have to choose between lending more to cover such wholesale funding which the companies cannot renew, or not doing so and instead risking loan credit losses on their existing lending. Depending on how the bank chooses to act in a stressed scenario, its exposure to the property companies can therefore increase.

Strong link between the commercial property sector and the financial system

Rising commercial property prices can increase the risks to financial stability in Sweden. The current price development seems to a large extent to be justified based on fundamental factors such as high rent levels, low vacancy rates and low funding costs. This suggests that the risks associated with the upturn in prices are lower than if they had been driven by speculation about further price increases. It is important to be aware that these factors can change, however.

To a certain extent, property companies seem to be allowing for this by not reducing direct yield requirements at par with the low risk-free interest rate. As the companies have also maintained a more or less unchanged share of equity capital as a proportion of total funding, they also have an unchanged capital buffer, which makes it possible for them to cope with a fall in commercial property prices to a certain extent.

At the same time, the property companies operate in a capital-intensive industry and are dependent to a high degree on borrowed capital. Even if the refinancing and interest rate risk for the companies does not seem to have increased in recent years, they are more sensitive than many other companies to rising interest rates and the link between the companies and the financial system is also stronger, due partly to the higher share of loan financing. A situation where property prices fall or interest expenditure rises sharply could therefore have an impact on financial stability in Sweden.

The banks' exposure to commercial property companies, compared with other lending, has not increased over the last six years, although their exposure has increased in terms of volume. Their lending to property companies is very extensive. It made up just over a third of their lending to non-financial corporations in Sweden, and amounts to 82 per cent of their Common Equity Tier 1 capital.

⁹⁸ As previously mentioned, property companies also have unutilised loan limits at banks totalling SEK 87 billion. In the Riksbank's survey, however, the banks state that these are, for a variety of reasons, difficult for the property companies to utilise in a stressed situation.

⁹⁹ The Riksbank offered loans to Swedish banks in exchange for them submitting non-financial corporation certificates as collateral for the loans. The Federal Reserve chose instead to lend money directly to the companies.

In addition to direct lending to property companies and the unutilised loan limits, banks also have indirect exposures via property companies' wholesale funding. This is not only because banks to a certain extent provide property companies with credit and liquidity facilities that are to cover their certificate funding, but also because they may have further additional exposure from property companies' other wholesale funding.

If problems were to arise on the commercial property market, the major Swedish banks risk being hit by wide-spread credit losses. In light of the development on the commercial property market and the market's importance for the financial system, it is therefore important to keep track of developments going forward in order to identify any changes that may increase the risks to financial stability.

ARTICLE – FinTech – increasingly rapid interaction between financial operations and technological innovation

FinTech – financial services combined with new technological innovations – have received considerable attention in recent years. New technological innovations have the potential to make the financial system more efficient, for instance, by substantially reducing transaction costs. At the same time, there is a risk that faster and more decentralised transactions, combined with increased IT dependence, can have a destabilising effect. Government agencies and international standard-setting organisations have therefore begun analysing FinTech and its effects on the financial system. This article provides a historical retrospective of the interplay between technological innovation and financial services, followed by a discussion of potential effects on financial stability.

FinTech – a broad phenomenon

FinTech is a collective term for the ongoing interaction between financial businesses and technical innovation. FinTech includes both new services that are based entirely on technical innovation, for example payments with virtual currency with the help of blockchain technology,¹⁰⁰ and traditional services that have been streamlined with the help of technical innovation. FinTech is a very broad phenomenon that can in principle affect all parts of the financial system, which opens up for a spectrum of risks and opportunities. In this article, FinTech refers to both the technology used by traditional agents on the financial market and technology used by new agents.

The telegraph was the start of globalisation

To put the current FinTech developments in context, it is important to see them in a historical perspective. Current developments are a continuation of a long, ongoing trend of interaction between technological advances and financial businesses. The difference now is that it is going considerably faster.

The introduction of the telegraph in the early 19th century can be regarded as a linchpin of financial globalisation. When a telegraph cable linked together financial centres in London and New York in 1866, it created the conditions for a rapid transfer of information on transactions over long distances. Towards the end of the 19th century, the telephone began to be used on a larger scale. This allowed greater centralisation in the banking system, as local offices could now coordinate their activities. Customers were communicating with the banks by telephone as early as 1890.

When the size of the banks' transactions grew, greater capacity for information processing was required. In the 1930s punch card machines (a precursor to today's computers) was used to an increasing extent. During the decades following the Second World War, the banks also started to use computers to an increasing degree.

Development of payment forms

One important technological innovation was the ATM, which was introduced in the United Kingdom and in Sweden in 1967. Now customers had access to cash 24 hours a day.

Credit cards were introduced in the United States at the beginning of the 1950s. The possibilities to pay by transferring money between bank accounts increased when debit cards were introduced in the mid-1970s. However, conflicts between banks and businesses led to the technology being implemented at a slow pace.

It is important to also draw attention to technology that did not make an impact. Videotex, which was introduced at the end of the 1970s, was a form of communication technology that used existing telephony networks. This technology made it possible to conduct banking errands at home via a terminal. During the 1980s, several attempts were made to introduce Videotex, but this technology never really caught on. The Cash Card is another example of technical innovation that never had an impact. The Cash Card was launched by Swedish banks in the late 1990s as a replacement for cash. The system allowed smaller amounts to be transferred from bank accounts to a special card.

¹⁰⁰ Segendorf, B. (2014). Has virtual currencies affected the retail payment markets? *Economic Commentary* No. 2 2014. Sveriges Riksbank.

The Internet entailed a breakthrough for conducting banking errands at home

The breakthrough of the Internet in the 1990s entailed a new opportunity to carry out banking errands at home. In Sweden, the first on-line bank was established in 1996, and in 1999 Swedish on-line banking was considered the best in the world, according to an international study. However, it took longer to establish than forecast. There were problems with slow bit rates and unreliable connections. Many potential customers were also suspicious with regard to the safety of on-line banking services. In the year 2000, *The Economist* declared that on-line banking services were a failure.¹⁰¹ Better bit rates, safer connections and a growing number of home computers meant that online banking services became increasingly common. When mobile phones, and in particular smart phones, entered the scene, the establishment of on-line banking services made more rapid progress.

New opportunities for making payments

The area where FinTech developments are perhaps most visible for consumers is payments. Many new opportunities to make payments, in addition to cards and cash, have emerged in recent years. Initially, these involved changes in the form of new, relatively simple methods of, for instance, storing credit card data for payments over the Internet. This development has then moved over from the computer to today's smart phones. Combined with new digital methods of identification, such as BankID, this development has led to several new methods of payment that do not require card terminals or cash handling – all that is needed is a telephone connected to the Internet. Simple and fast payments between private individuals and business operators can be made in principle anywhere, as the technology is not based on any fixed infrastructure. The mobile payment service Swish is a good example of one such innovation that is based on solutions created in cooperation between the Riksbank and the commercial banks.¹⁰² Although these payment solutions can have major advantages in the form of efficiency, they do not essentially change the stability of the financial system or the way it functions, as the solutions are still based on moving money between bank accounts.

Customer relations – centralisation versus diversification

The Swedish financial system is currently dominated by the four major banks, which offer a wealth of products – wage and savings accounts, asset management, mortgages and so on. To a large extent, customers tend to use

the same bank for several different services, partly because bank prices are often designed to encourage customers to choose more services. The development of FinTech can contribute to this concentrated form of offering services instead being diversified, so that customers choose different suppliers of different financial services. New technology and new regulation has made it possible for financial companies to obtain easier access to all of a customer's financial data, given that the customer approves this. In this way, financial actors can more easily and cheaply form a clear impression of a customer's entire private finances without the customer having to take any action. This also creates opportunities for companies to offer customers to automatically change between different savings accounts or mutual funds to attain the best return without the customer needing to ascertain who offers the best interest rate on savings.

Such a development can lead to increased competition and efficiency. But the development can also undermine stability, as customers are no longer as loyal when they can easily and quickly change from one company to another. Ultimately, this can mean that, for instance, deposits will be more volatile, which could lead to greater liquidity risks for companies who finance themselves in this way. This development can also lead to fragmentation of the market with a large number of newly formed and potentially less robust agents with different technical solutions that are less compatible with each other. Yet another risk is larger short-term price changes on various types of funds and financial instruments, as customers may be more inclined to move their savings, especially if they do not need to actively take any such decisions themselves, but it occurs automatically.

New forms of saving and loans

In recent years, an increasing number of types of internet-based platforms have been established, matching customers wanting to save money with those wanting to borrow. The platforms do not usually take any credit risk, but contribute information in the form of a credit assessment of the borrowers and help to mediate money from savers to borrowers. Although these platforms do not take credit risks, they, like other financial market actors, are exposed to operational risks and it is therefore important that they allocate sufficient resources to prevent them. Similarly, this type of business can give rise to risks for borrowers and lenders. The risks for the lender may be that he or she lacks adequate knowledge or skills to be able to assess the borrower's creditworthiness, or has no knowledge of who the borrower is. The risks for the borrower may be that

¹⁰¹ The Hollow promise of Internet banking, November 2000. *The Economist*.

¹⁰² Payments in real time make it possible to use the mobile payment service Swish. Article in *Financial Infrastructure Report 2013*. Sveriges Riksbank.

credit is granted on the wrong grounds due to a lack of credit assessment, which can result in increased lending to individuals with a poor ability to repay.¹⁰³ While these operations have grown rapidly, the loan volumes are yet very limited. For some segments, such as very small companies, this form of lending has become relatively important on certain European markets. Given the strong growth rate of these platforms, there is thus reason to continue examining this development.

New type of trading on the financial markets

Trade in financial instruments has changed in that electronic trading has become increasingly common and some types of intermediary have declined in significance. Today it is rather hedge funds and actors specialising in computerised trading, often in the form of so-called high frequency trading, which accounts for the largest part of the turnover on many markets.¹⁰⁴ This has contributed to faster transactions and lower transaction costs, but at the same time the rapid and automatic trade is linked to instability on the market as a result of technical errors or operational risks. In recent years, situations have arisen where the prices of a number of different financial instruments have fallen very rapidly in a very short period of time, and have then quickly recovered again. Opinion is divided as to the cause of these “flash crashes”, but some say that more automatic trading is at least part of the explanation.¹⁰⁵

Infrastructure for trade and payments may face decentralisation

The possibility to make large payments or to buy and sell large volumes of financial instruments, such as equity and bonds, is currently based on the existence of a central actor. This central actor ensures that the money from those who, for instance, buy a share is transferred to the seller and that the share is then transferred from the seller to the buyer.

New technologies such as blockchains and “distributed ledgers” are instead based on a decentralised technique that means a central actor is no longer needed to the same extent.¹⁰⁶ Instead, the transfer of securities, for instance, can be carried out directly between buyers and sellers. This development could lead to reduced risks and to lower costs when buying and selling financial instruments. The development can also mean that it becomes more difficult for authorities to gain knowledge of financial transactions that no longer go through a central agent even though the business is still under the

supervision of the authorities. However, the technology is new and it remains to be seen how far it will be possible to decentralise the financial infrastructure in a safe and efficient manner.

Cyber threats and RegTech – problems and possibilities

Increased digitalisation of the financial sector, combined with fragmentation and outsourcing of IT services could lead to new risks and vulnerabilities, so called cyber risks. It is becoming increasingly important to be aware of cyber risks as the financial sector becomes more dependent on interconnected IT systems.¹⁰⁷ As information on individuals and companies is stored and spread in the financial system, the need to manage this information in a safe way increases. If the information leaks to unauthorised parties, there is a risk that this will affect not only the people concerned, but also confidence in the financial system as such.

The risk of unsound or illegal activities such as money laundering and financing of terrorism could also increase if financial transactions are moved from central actors as public authorities opportunities to gain insight into the transactions deteriorates. At the same time, this development actually offers increased opportunities to automatically check customers’ transactions and behaviour. Some of these opportunities are sometimes known as “RegTech” (regulatory technology). In simple terms, it is about making it easier and less costly for financial agents to follow applicable laws and regulations as a result of increased automation and computer use. One example is automated review of data reported from financial institutions to government agencies.

Regulation and FinTech

Agents active in FinTech and conducting financial operations come under the same applicable legislation as other agents on the market. This means that the business may require a license if the agents conduct activities in payment mediation, lending, deposits or trade in financial instruments. These agents then come under the supervision of Finansinspektionen (FI). In many cases, however, the agents are newly started, which means that they only have a small number of employees and a very limited turnover. The legislation can therefore contain special regulations exempting the agents from the same level of supervision as larger, established agents. An example of this is the Payment Services Act, which contains provisions on agents with a turnover of less than certain threshold

¹⁰³ *Gräsrotsfinansiering i Sverige – en kartläggning*, 2015 [Grassroots funding in Sweden – an analysis, 2015]. Finansinspektionen.

¹⁰⁴ Bergsten, M. and Forss Sandahl, J. (2013). Algorithmic trading in the foreign exchange market, *Sveriges Riksbank Economic Review* 2013:1. Sveriges Riksbank.

¹⁰⁵ See, for instance, The Sterling ‘flash event’ of 7 October 2016, January 2017. BIS.

¹⁰⁶ The block chain – a potentially important innovation, article in *Financial Infrastructure Report 2016*. Sveriges Riksbank.

¹⁰⁷ Cyber threats in the financial system. Article in the *Financial Stability Report* 2016:1. Sveriges Riksbank.

values only having to register their business operations with FI.¹⁰⁸

In other cases, businesses run by FinTech agents can include new services not previously offered on the financial market. An example of this is agents who take on the role of intermediary and offer various types of technical platform aimed at matching borrowers and lenders. In many cases, the intermediary is not a contracting party but only supplies administrative and technical support in order to match borrowers and lenders. The boundary between licensed and non-licensed operations can be difficult to determine in these cases. Depending on which services are offered by the intermediary, the business may be covered by legislation on banks and financing businesses, payment services or consumer credit.

At the same time, regulation surrounding the financial market can make it difficult for new agents to establish themselves as complying with the requirements in the regulation can require significant resources. In this context, the regulation can constitute an obstacle to competition on the financial market. In recent years, however, lawmakers have tried to use regulation as a means of making it easier for new agents to establish themselves on the financial market. An example is the new payment services directive, which makes it possible for new agents, with the consent of the customer, to collect and present information about accounts from banks and to make payments on the bank account.¹⁰⁹

FinTech and financial stability

FinTech can be positive for the financial system in that it enables faster and more cost-effective financial transactions, increases the supply of financial services and automates reporting between financial institutions and authorities. This can promote an efficient payments system.

At the same time, the development can pose risks to financial stability. One such risk is increasingly flexible financial transaction flows, which can pose liquidity risks for agents who obtain funding via new financial services. Rapid and automated movement of capital can also create risks with large and unexpected price movements on stock exchanges and in financial instruments. The trend of financial transactions being moved from central agents can also make it more difficult for authorities to gain knowledge of financial transactions, which in turn could make it more difficult to uncover unsound or illegal activities such as money laundering and the funding of terrorism.

Historical developments have shown that it can be difficult to predict how new technology may affect the

financial sector, which services customers will choose and what risks the development may entail. The origin of the financial crisis of 2007–2008 is an example of how a lack of knowledge about the risks associated with complicated new instruments and innovative business models had major consequences for the global economy. This does not mean that FinTech necessarily poses this type of risk, but it is a development that can entail both new opportunities and new and poorly understood risks.

An important challenge is therefore to consider the interaction between technical development, technological innovations and its effect on the financial market.

International work to ensure stability

Global standard-setting bodies such as the Financial Stability Board (FSB), the Basel Committee for Banking Supervision (BCBS), the Committee on Payment and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO) are working on analysing FinTech from different perspectives, including what effect it might have on financial stability. However, as yet there are no standards that are solely aimed at FinTech. Instead, the purpose of the work at this stage is mainly to gather information and analyse which opportunities and risks the new technology can entail.

The Riksbank and FI are taking part in and influencing this international work. Sweden also has a prominent role in that the Swedish financial system is already digitalised to a large extent, the use of cash is very low and the use of smart phones is widespread. This has also contributed to a widespread emergence of FinTech companies in Sweden, primarily within different forms of digital payments. The reduction in cash use has also prompted the Riksbank to appoint an inquiry into the possibilities of continuing to offer households the option of holding a claim against the Riksbank by issuing digital money, e-kronor, in the future.¹¹⁰ In some countries, also the financial supervisory authorities and central banks have adopted a more active role for the purpose of supporting innovation and technological advances by offering, for instance, various forms of test environment that private companies can use to test new solutions, while they receive information on existing regulations - known as regulatory sandboxing.

¹⁰⁸ The Payment Services Act (2010:751).

¹⁰⁹ *Financial Infrastructure 2016*, Sveriges Riksbank.

¹¹⁰ The Riksbank's e-krona, *project plan*, March 2017. Sveriges Riksbank.

ANNEX

Table A:4 Recommendations that have been fulfilled

Recommendations	Introduced in the report	Fulfilled in the report
The government and the Riksdag should urgently work to make it possible to introduce an amortisation requirement for new mortgages.	2015:1	2016:1
The major Swedish banks should report their leverage ratios at least once a quarter.	2013:2	2015:1
The risk weight floor for Swedish mortgages should be raised.	2013:2	2014:2
The major Swedish banks should ensure that they have a CET 1 capital ratio of at least 12 per cent on 1 January 2015.	2012:1	2013:2
The framework for the reference rate Stibor should be reformed through the establishment of clear responsibility, clear governance and control, better transparency, the possibility of verification and an obligation for banks to conduct transactions at their stated bids on request.	2012:2	2013:2
The major Swedish banks should improve the transparency of their public reporting as regards information on asset encumbrance.	2012:2	2013:1
The major Swedish banks should report comparable key ratios in the form of the subcomponents of the Liquidity Coverage Ratio (LCR).	2011:2	2013:1
The major Swedish banks' Liquidity Coverage Ratios (LCR) should amount to at least 100 per cent.	2011:2	2012:2
The major Swedish banks' Liquidity Coverage Ratios (LCR) should amount to at least 100 per cent in euro and US dollars respectively.	2011:2	2012:2
The major Swedish banks should report their Liquidity Coverage Ratio (LCR) at least once a quarter beginning no later than the interim report published after 1 July 2012.	2011:1	2012:2
The major Swedish banks should improve the transparency of their public reporting by reporting maturity information per asset and liability type, broken down per currency.	2011:1	2012:2

GLOSSARY

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

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.

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.

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

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.

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

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.

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.

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).

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

LCR, Liquidity Coverage Ratio or liquidity ratio: Liquidity measurement defined by the Basel Committee that measures a bank's ability to deal with a stressed net outflow of liquidity for 30 days. In simple terms, an LCR of 100 per cent means that a bank's liquidity reserves are adequate to enable the bank to manage an unexpected liquidity outflow for 30 days.

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.

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.

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.

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.

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

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

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

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.

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.

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.



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