



Financial Stability Report 2015:2

25 January 2016

Table 3:2 contained incorrect information about tax relief on interest expenditure in Norway. The error has been corrected in this version.

The Riksbank and financial stability

- The Riksbank defines financial stability as meaning that the financial system is able to maintain its three basic functions – the mediation of payments, the conversion of savings into funding and risk management – and is also resilient to disruptions that threaten these functions.
- The financial system plays a vital role in the economy. It is necessary to have a stable and smoothly-running financial system for the economy to function and grow. A serious crisis in the financial system is liable to entail extensive economic and social costs.
- The 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 grant emergency liquidity assistance to individual institutions if problems arise that threaten financial stability. To be able to do this in an effective way, the Riksbank needs to be well prepared for crises by having an efficient crisis organisation.
- We share responsibility for promoting financial stability with Finansinspektionen (the Swedish Financial Supervisory Authority), the National Debt Office and the Ministry of Finance. The Ministry of Finance is responsible for the regulation of financial enterprises and Finansinspektionen has responsibility for microprudential and macroprudential policy. The Swedish National Debt Office is, in turn, a support and resolution authority. The interaction between the authorities is important both in the 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.

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 23 November 2015. The Report takes into account data available as of 16 November 2015. The report is available on Sveriges Riksbank's website, www.riksbank.se. It is also possible to order a printed version of the report free of charge on the website, or to download the report as a PDF.

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■ Summary

THE FINANCIAL SYSTEM IS VULNERABLE TO SHOCKS

The major Swedish banks are reporting high levels of profitability and the debt-servicing ability of their customers is good. This is contributing to the Riksbank's assessment that the financial system is currently working well. However, the Swedish banking system is also large and tightly interlinked. In addition, the major Swedish banks have a high proportion of wholesale funding, a large part of which is in foreign currency, as well as a low proportion of equity in relation to assets. This makes the banking system, and the financial system as a whole, sensitive to various shocks.

HIGH ASSET VALUATIONS COMBINED WITH HIGH INDEBTEDNESS ARE LEADING TO RISKS

According to the Riksbank's analysis, the valuations on several asset markets are high from a historical perspective. This is particularly true of the Swedish housing market. The probability of a fall in prices is therefore also elevated. This, together with increasing indebtedness in the household sector, has made both households and financial institutions more vulnerable. In the event of a serious shock, the consequences for the Swedish economy could be very great.

MEASURES ARE NEEDED TO REDUCE THE RISKS LINKED TO HOUSEHOLD INDEBTEDNESS

To reduce the risks linked to the rising housing prices and households' rising indebtedness, the Riksbank deems a combination of various measures to be necessary to both subdue new lending and have an impact on the loan stock. Measures which tackle the underlying causes of rising indebtedness are central to this, such as reforms to the housing market. By creating a better balance between supply and demand, the rise in housing prices can be slowed down, and consequently so too can indebtedness. Reforms that make households less willing to take on debt are also important, such as gradual reductions to tax relief. The Government's proposal for new legislation introducing an amortisation requirement is a step in the right direction, but more measures are needed. A potential complementary measure could be to introduce a debt-to-income limit that restricts how much a household may borrow in relation to its income. It is also of the greatest importance that the mandate for macroprudential policy of Finansinspektionen (the Swedish financial supervisory authority) is clarified as soon as possible so that efficient macroprudential policy can be conducted in Sweden.

The Riksbank's assessment is thus that several different measures are needed. Exactly which reforms are undertaken is not important, however. What is important is that the reform process gathers pace so the risks cannot increase any further. It is also important that household indebtedness is subdued in a gradual and balanced way so stability risks do not increase in the short term.

THE RESILIENCE OF THE MAJOR BANKS NEEDS TO BE STRENGTHENED

It is also important to reduce the vulnerability of the banking system. In recent years, the major Swedish banks have improved their resilience to both credit and liquidity risks. This is a positive development, but the Riksbank considers that the resilience of the major banks needs to be improved further. The capital requirements for the banks should be tightened, for example by introducing a minimum leverage-ratio requirement. The major banks should also increase their resilience to short-term liquidity risks in Swedish kronor and reduce their structural liquidity risks.

1. Assessment of current situation

On the financial markets, several years' of low interest rates have contributed towards a rise in asset prices. Equity prices have risen sharply and are currently high from a historical perspective. Since the summer, however, asset prices have periodically fallen somewhat as a result of the increased uncertainty which has characterised the financial markets. This development has not been reflected on the Swedish housing market. The prices there have instead increased continuously and at a very fast rate. Hand in hand with this, household indebtedness has also continued to increase. The Riksbank is of the opinion that this is a concerning development which entails major risks.

INCREASED VOLATILITY ON THE FINANCIAL MARKETS

Since the financial crisis of 2008, resource utilisation has been weak and inflation has been low in many countries. This has led to many central banks lowering their policy rates to historically low levels while starting to purchase different types of securities. In Sweden and a couple of other countries, policy rates are now negative. The expansionary monetary policy has contributed to a general rise in prices for financial assets. Investor demand for high-risk assets has increased, among other things. Equity prices have, for example, shown a rising trend for several years (see chart 1:1).¹

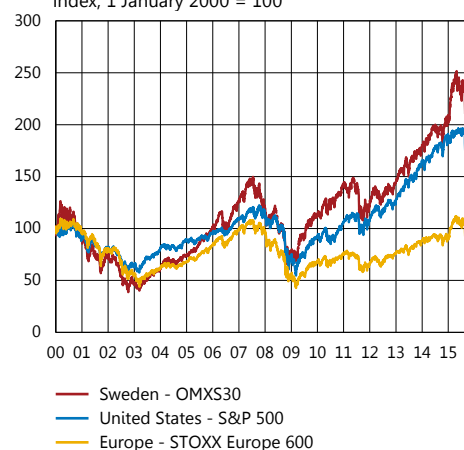
However, since the summer, demand for high-risk assets has periodically declined. This has led to lower asset prices, higher risk premiums and increased volatility. This applies in particular to the equity market, but also to the bond and foreign exchange markets. The index for financial stress has therefore also risen, on the whole, over the last six-month period (see chart 1:2). Despite the recent downturn, equity prices are still assessed to be highly valued from a historical perspective (see article Asset valuations and financial stability).

UNCERTAINTY REGARDING GLOBAL GROWTH

The main reason for the recent developments on the financial markets is the increased uncertainty over global growth prospects. This is above all due to the slowdown of the Chinese economy and several other major emerging market economies. In addition, there are signs that the macroeconomic risks have increased in these countries, among other reasons due to the increase of indebtedness in the non-financial corporate sector.

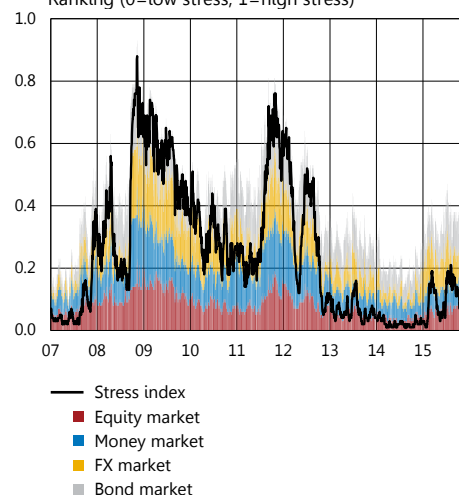
At the same time, the economic recovery in many advanced economies has continued. The US economy is developing positively and, according to the Federal Reserve's forecast, it will start to raise its policy rate in the near future. The recovery in the euro area is also continuing, albeit at a slower pace. In addition, weaknesses such as large budget deficits, high central government debts, banks with financial problems and widespread unemployment are present in several countries.

Chart 1:1 Equity markets
Index, 1 January 2000 = 100



Sources: Bloomberg and the Riksbank

Chart 1:2 Swedish stress index
Ranking (0=low stress, 1=high stress)

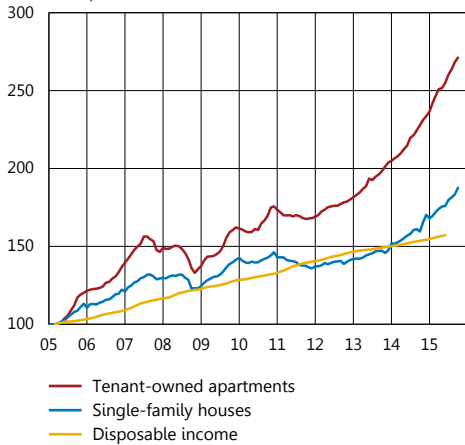


Note. The Swedish stress index has been produced by the Riksbank using a method similar to that used by the ECB for the European stress index. See Johansson, T. and Bonthron, F. (2013), Further development of the index for financial stress in Sweden, *Economic Review* 2013:1. Sveriges Riksbank.

Sources: Bloomberg and the Riksbank

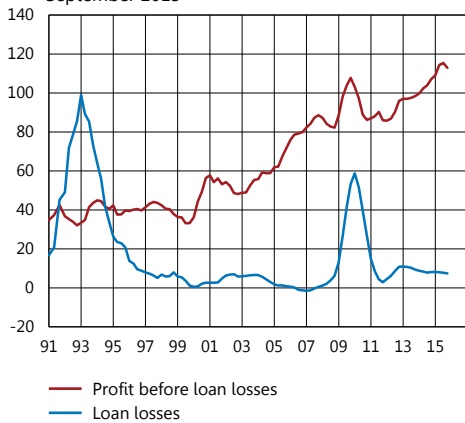
¹ See the Appendix for additional charts on developments on the financial markets, the Swedish banking groups' borrowers and the Swedish banks (www.riksbank.com).

Chart 1:3 Housing prices and households' disposable income in Sweden
Index, March 2005=100



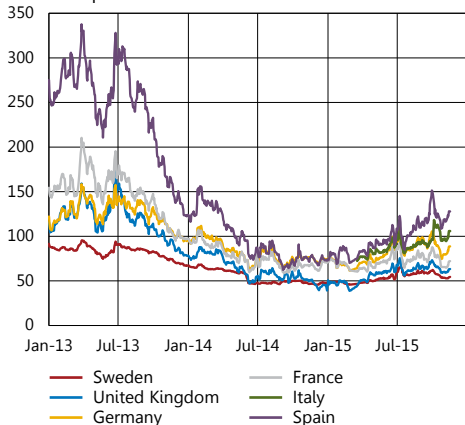
Note. Housing prices have been seasonally adjusted.
Sources: Valueguard and the Riksbank

Chart 1:4 Profits before loan losses and loan losses in the major Swedish banks
Rolling four quarters, SEK billion, fixed prices, September 2015



Sources: Bank reports and the Riksbank

Chart 1:5 Five-year CDS premiums for banks
Basis points



Note. Average of comparable major banks domiciled in each country respectively. CDS premiums indicate the banks' costs for unsecured borrowing on the bond market.

Sources: Fitch and the Riksbank

CONTINUED RISE IN HOUSING PRICES AND DEBTS

Growth in the Swedish economy is continuing to be solid. This is due among other things to the low interest rates which have increased households' capacity for consumption. Housing prices have also continued to rise at a rapid pace. The increase in prices has been on average 18 per cent during the last year. This is considerably faster than the growth rate for household incomes (see chart 1:3). Rising housing prices have also led to household debts continuing to rise. This is a concerning development which entails major risks. Prices on commercial properties have also risen slightly, but the principal increase has been in transaction volumes, as has the proportion of foreign investors.

Both households and companies in Sweden have good borrowing options.² However, the rate of increase in borrowing for companies is slower than it is for households. One explanation for this is that investments have continued to be relatively small due to the weak economic activity in many export countries. This also applies to several of the Nordic countries. In Norway, which is one of Sweden's most important export markets, economic activity has slowed down clearly this year and, in Finland, the economy has continued to shrink for the third year in a row.³

PROFITABILITY IS HIGH IN THE MAJOR SWEDISH BANKS

The major Swedish banks have continued to report low credit losses and good profits (see chart 1:4). Profitability also continues to be high. The low interest rates have resulted in the banks earning slightly less for every krona lent as the interest rates have not fallen as much for deposits as for lending. However, this has been compensated for by such things as higher lending volumes, particularly of mortgages, and by higher revenues from other business areas (see also the article Swedish financial institutions and low interest rates). The major banks have also continued to have good access to wholesale funding and low funding costs compared to other banks (see chart 1:5). The economic downturns in Norway and Finland have not yet led to higher credit losses and the major banks' borrowers, both in Sweden and overseas, are still considered to have good debt-servicing ability. Overall, the financial system is assessed to be working well at present.

OPERATIONAL RISKS IN THE INFRASTRUCTURE

The financial infrastructure in Sweden is assessed to be functioning well. However, a replacement of Euroclear Sweden's technical system for securities settlement has been initiated. Such a project is innately associated with risks. Operational risks in the infrastructure will therefore remain heightened until the system replacement has been completed.⁴

² This also applies to commercial property companies. For more about companies' borrowing options, see the *Economic Tendency Survey*, October 2015. National Institute of Economic Research.

³ *Monetary Policy Report*, October 2015. Sveriges Riksbank.

⁴ *Financial Infrastructure Report 2015*. Sveriges Riksbank.

■ 2. Vulnerabilities and risks in the financial system

The structure of the Swedish banking system makes it vulnerable to shocks. The present assessment is that shocks may most likely arise and be strengthened by the high valuations on the asset markets, above all on the Swedish housing market, as well as by Swedish households' high indebtedness. If a shock should arise in the household sector, for example due to a fall in housing prices, this may lead to weaker consumption. Such a development would not only have significant consequences for macroeconomic stability but also for financial stability. Historically, sharp falls in asset prices combined with extensive private indebtedness have contributed to deep and long-term recessions.

Vulnerabilities and risks in the banking system

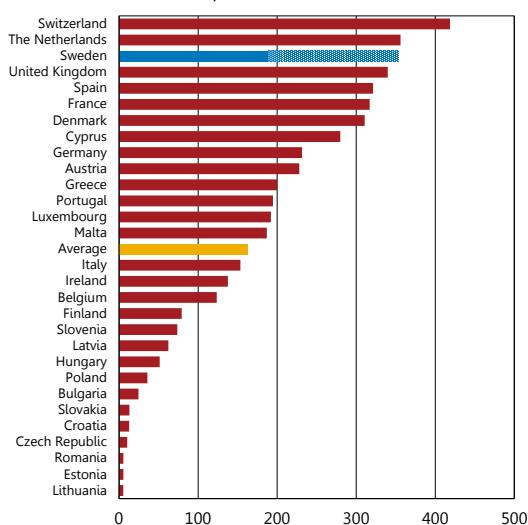
The positive development of the major Swedish banks, with good profits and low loan losses, is expected to continue in the period ahead. However, there are vulnerabilities in the structure of the Swedish banking system. These make the financial system as a whole sensitive to shocks. The present assessment is that shocks may most likely arise and be strengthened by the high valuations on the asset markets, above all on the Swedish housing market, as well as by Swedish households' high indebtedness.

STRUCTURAL VULNERABILITIES IN THE BANKING SYSTEM

In recent decades, the funding of housing purchases has, in principle, moved entirely into the banking system, in addition to which many Swedish banks have established extensive operations overseas. As a result of this, Sweden has a very large banking system at present. If the Swedish banks' domestic and foreign operations are added together, their total assets amount to a sum corresponding to just over 350 per cent of Sweden's GDP (see chart 2:1). In addition, the banking system is highly concentrated around the four major banks (Nordea, Handelsbanken, SEB and Swedbank), which are tightly interlinked with each other. Among other things, this interconnection is due to the banks having significant holdings of each other's securities. This cross-ownership amounts, at present, to a value corresponding to about 30 per cent of the total equity of the major banks (see chart 2:2). In addition, the Swedish banks are closely interlinked with other participants in the Swedish financial system, for example because Swedish insurance companies and funds hold a large part of their covered bonds (see chart 2:3).

As the banks have so large amounts of mortgages on their balance sheets⁵, there also exists a strong connection between the banking system and the Swedish housing market. These mortgages are funded, to a great extent, using wholesale funding, above all with covered bonds, which are backed by mortgages as collateral. This means that the banks are dependent both on the markets functioning well and on there being high confidence among investors in both the Swedish banking system and the Swedish housing and mortgage market.

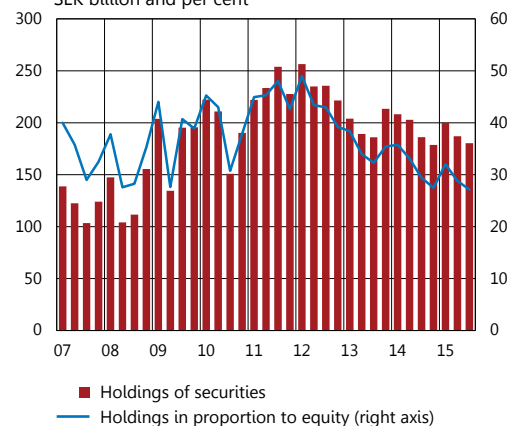
Chart 2:1 The banks' assets in relation to GDP
December 2014, per cent



Note. Banking assets includes all of the assets of the national banking groups, that is both foreign and domestic assets. The banks' insurance operations are, however, excluded. The shadowed part of the blue bar shows the four major banks' assets in foreign subsidiaries and branches in relation to Sweden's GDP.

Sources: The ECB, the European Commission, the Swiss National Bank and the Riksbank

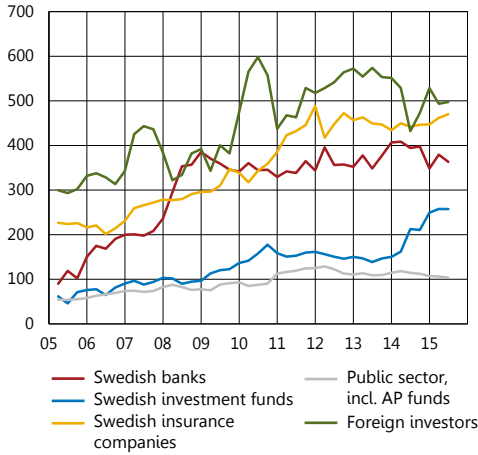
Chart 2:2 The major banks' holdings of each other's securities
SEK billion and per cent



Sources: Bank reports and the Riksbank

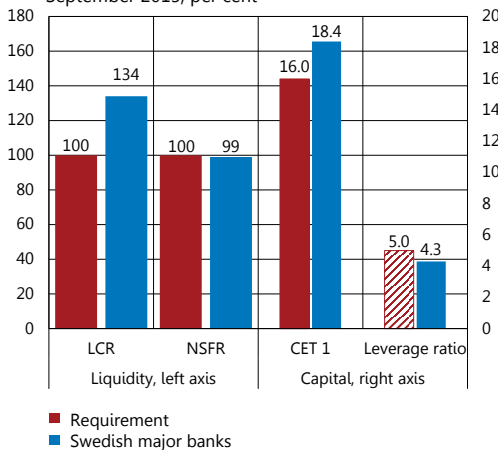
⁵ About half of the major banks' lending in Sweden consists of mortgages.

Chart 2:3 Owners of Swedish covered bonds
SEK billion



Sources: Statistics Sweden and the Riksbank

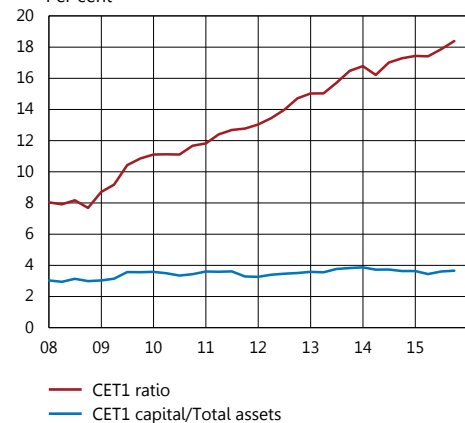
Chart 2:4 The four Basel III-measurements
September 2015, per cent



Note. Minimum leverage ratio is yet to be determined, the chart therefore shows the level that the Riksbank recommends as of 2018 (dashed bar). The minimum level for the CET 1 ratio is calculated as the average weighted total capital requirement for the major banks. The banks' capital ratios are expressed as a weighted average.

Sources: Bank reports and the Riksbank

Chart 2:5 The major banks' CET 1 capital ratios and CET 1 capital in relation to total assets
Per cent



Note. Weighted average. CET 1 capital in relation to total assets is used as a simplified estimate of the banks' leverage ratios.

Sources: Bank reports and the Riksbank

As the banking system is so concentrated and interconnected, it is likely that the entire banking system would be negatively impacted if problems were to arise in one of the major banks. In addition, the size of the banking system means that any problems in the banks may be very expensive for the government to manage. To reduce the probability of a financial crisis and also to reduce the costs for the government in the event of a crisis, it is of the greatest importance that the major banks have sufficiently high resilience. This means that the banks need to have enough capital and large enough liquidity buffers in all relevant currencies. In addition, they need to have sufficient capacity to be able to bear losses and handle recapitalisation requirements on their own in a crisis situation.⁶

Nordea's plans to change its corporate structure could entail a major change to the Swedish banking system in the period ahead. These plans involve merging the Nordic subsidiaries with the Swedish parent company to form a Swedish company with branches in the other Nordic countries.⁷ At present, about three-quarters of Nordea's total assets are in foreign operations. This kind of restructuring would lead to Nordea's Swedish operations becoming significantly larger. It would also tie Nordea's operations more closely to Sweden than at present, with main responsibility for supervision and resolution of both the Swedish and foreign operations falling on the Swedish authorities. This would involve a major structural transformation of not only the Swedish banking system but of the Nordic one too.

THE MAJOR SWEDISH BANKS HAVE LOW LEVERAGE RATIOS

Following the financial crisis, comprehensive international reform work was initiated to strengthen the resilience of the financial system. This included the new minimum requirements for capital and liquidity under the framework of the Basel III Accord. In certain areas, the resilience of the major Swedish banks has improved in recent years. The major banks have built up liquidity buffers in foreign currency and have strengthened their CET 1 capital ratios, which has resulted in them now having both liquidity cover ratios (LCRs) and CET 1 capital ratios exceeding the minimum requirements (see chart 2:4). At the same time, certain liquidity risks remain too great and the leverage ratio too low.

Although the major banks' CET 1 capital ratios have greatly increased in recent years, the leverage ratio has remained at relatively low levels (see chart 2:5). The increase of CET 1 capital ratios can primarily be explained by the banks' risk weights having fallen, rather than by capital having increased. This has happened as the banks have started to use internal models to calculate the risk weights in increasingly large parts of their loan portfolios. This is, of course, in accordance with regulations and has been approved by Finansinspektionen (FI). But, at the same time, the internal models are associated with uncertainty. One problem is that they are based on

⁶ This refers to what is known as the bail-in tool, which is part of the EU's new regulatory framework for how member states are to manage banks in crisis, the Bank Recovery and Resolution Directive.

⁷ Nordea's banking operations in the Baltic countries are already operating as branches.

historical experiences and, consequently, are not necessarily able to predict future losses. Furthermore, the models are focused on each individual bank and therefore do not capture structural vulnerabilities and risks that may exist in the banking system as a whole. All in all, this may mean that the banks are holding too little capital, which, in turn may lead to increased risks in both the individual banks and the banking system as a whole.

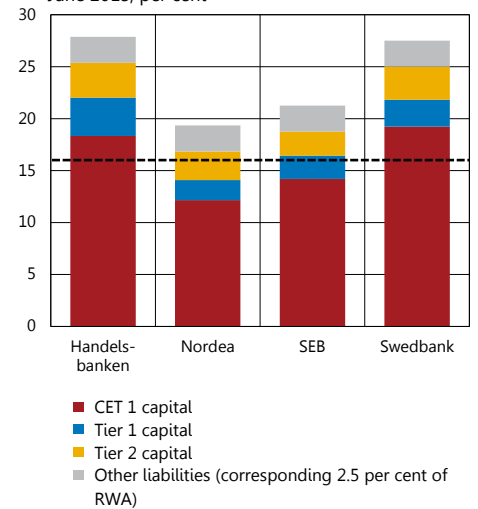
NEW REGULATIONS TO REDUCE STABILITY RISKS

Another part of the international reform work is an initiative within the Financial Stability Board (FSB) aimed at reducing stability risks and the risk that taxpayers will be impacted by costs during banking crises. Recently, it was decided that the global systemically important banks must have a Total Loss Absorbing Capacity (TLAC) corresponding to at least 16 per cent of risk-weighted assets and at least 6 per cent of total exposures⁸ as of January 2019.⁹ The capital instruments included in the Basel III Accord's capital requirements are counted as loss-absorbing, but certain other types of debt instrument with remaining times to maturity of at least one year may also be used to fulfil the requirements.¹⁰ Nordea is one of 30 banks in the world to be classed as globally systemically important. This means that Nordea will have to comply with these requirements from 2019. Whether the other major Swedish banks will be subject to the TLAC requirements depends on how they are implemented in Europe and Sweden. Nor is the exact design of the requirements within the EU clear. Banks will be able to adjust their balance sheets up to 2019, however, if the design determined by the FSB were to be binding today and were to apply to all major Swedish banks, the Riksbank's calculations show that the banks would need to have a greater loss-absorbing capacity (TLAC) to cope with both requirements (see chart 2:6 and 2:7).

LIQUIDITY RISKS REMAIN IN THE MAJOR SWEDISH BANKS

As regards the liquidity risks, certain major Swedish banks periodically have very low liquidity coverage ratios (LCRs) if the measure is considered separately in Swedish kronor (SEK). The lowest levels indicate that the liquidity buffers in kronor would not even be sufficient to manage one-quarter of the liquidity outflows expected to arise over a stress period of 30 days (see Chapter 3). The major banks are also deemed to still be exposed to large structural liquidity risks. This is partly reflected by the structural liquidity measure Net Stable Funding Ratio (NSFR), where the major Swedish banks stand out with comparatively low levels in relation to many other banks in Europe.¹¹ The imbalances in maturities between the major banks'

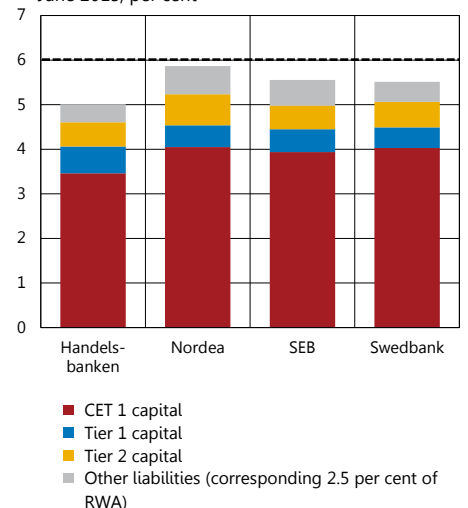
Chart 2:6 Equity and eligible liabilities (TLAC) in relation to risk-weighted assets
June 2015, per cent



Note. The capital held to meet the requirement for the Basel regulatory framework's buffers has been excluded from chart 2:6. Both chart 2:6 and chart 2:7 are based on the Riksbank's own calculations, which use public data as a base. The calculations include CET 1, Additional Tier 1 and the Tier 2 that is included in the capital base. Furthermore, unsecured debts corresponding to 2.5 per cent of RWA is included. Other subordinated liabilities are not included, which implies a potential underestimation of the total loss-absorbing capacity.

Sources: Bank reports and the Riksbank

Chart 2:7 Equity and eligible liabilities (TLAC) in relation to total exposures
June 2015, per cent



Note. See chart 2:6.

Sources: Banks reports and the Riksbank

⁸ Total exposures means the denominator in the Basel Committee's definition of the leverage ratio, which total assets plus off-balance sheet items and derivatives.

⁹ As of January 2022, the requirements will be further increased to 18 and 6.75 per cent, respectively.

¹⁰ The numerator in the TLAC definition is thus larger than in the Basel III Accord's capital requirements. Consequently, TLAC ratios are typically higher than the CET1-ratio and the leverage ratio under the Basel III Accord.

¹¹ See Gobat J., Yanase M., Maloney J. (2014), The Net Stable Funding Ratio: Impact and Issues for Consideration, *IMF Working Paper* 14/106. The International Monetary Fund

assets and liabilities are additionally larger for longer maturities than those captured by the NSFR.¹²

Even if resilience has improved in the major Swedish banks, the risks thus remain high within certain areas. Together with the structural vulnerabilities of the Swedish banking sector, this entails increased sensitivity for shocks to the financial system. The following two sections describe further factors that are deemed able to lead to and reinforce such shocks.

Vulnerabilities and risks on the financial markets

In Sweden and many other countries, the central banks have conducted an increasingly expansionary monetary policy in recent years. This has been necessary to stimulate economic growth and counter-act the risks of excessively low inflation. The low interest rates have also led to increased risk-taking among participants in the economy. Increased risk-taking may lead to increased vulnerability in the financial system. Among other things, this is connected to the possibility of assets becoming overvalued and risks incorrectly priced, with the probability of large price falls on the asset markets thereby increasing. Risk in the financial system may also increase if this leads to financial institutions having a worse financial situation or if they increase the risks in their operations. These risks are not specific to Sweden. The European Systemic Risk Board (ESRB) also emphasises that a global repricing of risk premia on the financial markets is one of the largest EU financial stability concerns. Among other things, it sees possible weakening of financial institutions' financial position.¹³

HIGH VALUATIONS INCREASE THE PROBABILITY OF PRICE FALLS

In a situation in which risk-taking is initially high, a changed view of risks in the economy or the financial markets may lead to many investors rapidly choosing to reallocate their asset portfolios and reduce their risk-taking. This could, in turn, lead to a situation with falling prices and high volatility on the financial markets.¹⁴ Even if asset prices have fallen somewhat recently, the Riksbank's analysis shows for example that the valuation of the Swedish stock market is presently high from a historical perspective. The probability of a fall in prices is thus elevated (see the article *Asset valuations and financial stability*).

In addition, there are signs that liquidity has deteriorated on certain financial markets in recent years. The causes of this development are not self-evident. But one explanation frequently proposed by market participants and other analysts is that the banks changed their behaviour following the global financial crisis and as a result of

¹² Liabilities in the NSFR are given full value as stable funding at a maturity of one year. If the banks simultaneously have assets with very long maturities, an NSFR of 100 per cent does not necessarily mean that the maturity of assets and liabilities is the same.

¹³ See the press release from the ESRB's General Board meeting of 24 September 2015.

¹⁴ See Johansson T. (2013), Search for yield in a low interest-rate environment, *Economic Commentaries*, no. 4, 2013. Sveriges Riksbank.

new regulations.¹⁵ The impaired market liquidity may strengthen the effects of a reallocation as it means that individual transactions have a greater impact on asset prices. This may result in new conditions and, in the absence of previous experience, it thus becomes uncertain how the financial markets would function under stress conditions.

There are several plausible scenarios in which the vulnerabilities that have accrued on the financial markets could contribute to increased financial stress. Regardless of origin, these would be unexpected events not reflected in the present pricing or in expectations of future trends. For example, this could be a matter of growth in China (and thus world trade) being weaker than expected, more negative effects than expected arising when the US Federal Reserve starts to raise its policy rate, or Swedish housing prices falling.¹⁶

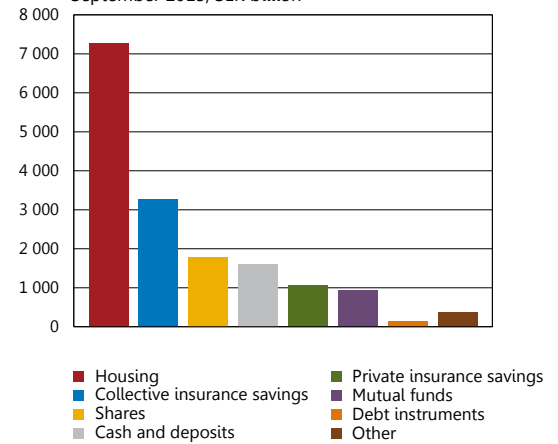
STRESS ON THE INTERNATIONAL FINANCIAL MARKETS MAY AFFECT STABILITY IN SWEDEN

The occurrence of rapid and unexpected fluctuations in asset prices, with increased stress on the international financial markets as a consequence, could impact the stability of the Swedish financial system. For example, this could take place if the banks' funding becomes more expensive or less accessible. This would be particularly true if investors simultaneously deemed that the risks in Sweden had increased, for example due to the development of the housing market. In an unfavourable scenario, this could lead to serious liquidity problems in the Swedish banking system. The recent crisis of 2008–2009 provides an example of a situation in which the Swedish banks encountered problems with liquidity. The Riksbank then had to lend both kronor and foreign currency to the banks so that the financial system could function.¹⁷

Even if the situation does not become so serious that it leads to liquidity problems for the banks, it is likely that higher funding costs would influence the interest rates paid by households and companies for their loans. As the Swedish households are highly indebted and a large part of their loans are at variable interest rates, higher interest rate increases can rapidly impact households' scope for consumption. In addition to this, a significant part of Swedish households' financial saving consists of shareholdings (see chart 2:8). If equity prices were to fall heavily, this would also thus have a direct effect on household wealth.

Increased stress on the financial markets can additionally lead to problems for non-financial companies which obtain funding for parts of their operations on the market via corporate bonds. This applies, for example, to property companies which are among the largest

Chart 2:8 Households' assets in Sweden
September 2015, SEK billion



Source: Statistics Sweden and the Riksbank

¹⁵ See *Financial Stability Report*, July 2015. Bank of England and *IMF Global Financial Stability Report*, October 2015. The International Monetary Fund.

¹⁶ Market participants also highlight such events in the Riksbank's risk survey as factors that could influence development in the future. See *Market participants' assessment of the functioning of the Swedish fixed-income and foreign exchange markets*, autumn 2015. Sveriges Riksbank.

¹⁷ See, for example, Elmér, H., Guibourg, G., Kjellberg, D. and Nessén, M. (2012), The Riksbank's monetary policy measures during the financial crisis – Evaluation and lessons learnt, *Sveriges Riksbank Economic Review* 2012:3. Sveriges Riksbank.

issuers on the Swedish corporate bond market.¹⁸ In a stress situation, these companies may find it difficult to fund their investments or to refinance their outstanding bonds once they have matured. In such a situation, it is likely that the companies would utilise their lines of credit with the banks. Those companies lacking lines of credit could possibly raise further bank loans. This could add to the negative effects for the banks' liquidity and, additionally, could affect the banks' capital adequacy negatively.

BANKS AND INSURANCE COMPANIES HAVE BECOME MORE VULNERABLE

The risks in the financial system may also increase if the low interest rates lead to financial institutions seeing their financial situations deteriorate or changing their behaviour. Among other things, the low interest rates may exert pressure on the banks' profitability and make it more difficult for life insurance companies to reach the guaranteed yields they have promised for their customers' pension savings. If interest rates remain low for a longer period, the financial institutions may therefore compensate for the effects of the low interest rates by increasing their risk-taking. For example, the banks could start lending money to higher-risk borrowers and the life insurance companies could start investing in higher-risk assets. The banks could also introduce negative deposit rates. Negative deposit rates reduce the banks' funding costs, but at the same time there is a risk of customers moving their savings or withdrawing money as cash instead. If this were to happen rapidly, it could entail risks to financial stability. For example, individual banks could then be exposed to liquidity stress, which could damage confidence in the entire Swedish banking system.¹⁹ At present, however, the banks have only chosen to introduce negative interest rates on a limited amount of their deposits.

According to the Riksbank's analysis, there are no clear indications yet that risk-taking has increased among banks or life insurance companies. However, the low interest rates have contributed towards an increase in the banks' lending for housing purchases. Consequently, the Swedish banks' exposures to the housing market, which were already large, have increased further. Insurance companies also have become more vulnerable because, all other factors being equal, their solvency ratios²⁰ are lower when interest rates are low. Additionally, their large shareholdings and the fact that the equity market is highly-valued lead to increased vulnerability (see also the article Swedish financial institutions and low interest rates).

¹⁸ See Bonthron, F. (2014), Developments on the Swedish corporate bond market, *Economic Commentaries*, no. 7, 2014. Sveriges Riksbank.

¹⁹ For further discussions see for example Alsterlind, J., Armelius, H., Forsman, D., Jönsson, B. and Wretman A.-L. (2015), How far can the repo rate be cut?, *Economic Commentaries*, no. 11, 2015. Sveriges Riksbank.

²⁰ The solvency ratio is a measure of an insurance company's financial position, see also article Swedish financial institutions and low interest rates.

NEGATIVE INTEREST RATES HAVE CERTAIN CONSEQUENCES FOR THE FUNCTIONING OF THE MARKET

Among other things, the negative levels of a number of market rates have impacted the handling of bonds with variable coupons. A variable coupon is an interest payment that is not specified in advance but is linked to some form of reference rate. When the reference rate, such as the three-month Stibor, is now negative, this coupon can also be negative. This means that the investor should pay the coupon to the issuer, instead of receiving the coupon rate as normal. Neither Swedish market practice, Euroclear Sweden's system nor most bond agreements are designed to be able to manage negative coupons. This means that this is something that could create uncertainty on the Swedish bond market. So far, this has been solved by investors not having to pay negative coupons even though the interest rate has been negative. To remove uncertainty, it is important that each participant intending to issue bonds with variable coupons explains to the other market participants how these bonds have been adapted to the negative interest rates.²¹

Finally, a majority of market participants surveyed in the Riksbank's risk survey consider that the functioning of the fixed-income market has become impaired. One of the reasons for this is considered to be the Riksbank's purchases of government bonds as these have led to a decrease of the outstanding volume of bonds available for trade on the secondary market. The market participants thereby consider that liquidity on the Swedish government bond market has deteriorated.²² It is important to carefully follow this development. So far, however, the Riksbank does not consider that the asset purchases or the negative interest rates have led to a deterioration of the financial system's functionality in such a way as to affect financial stability.

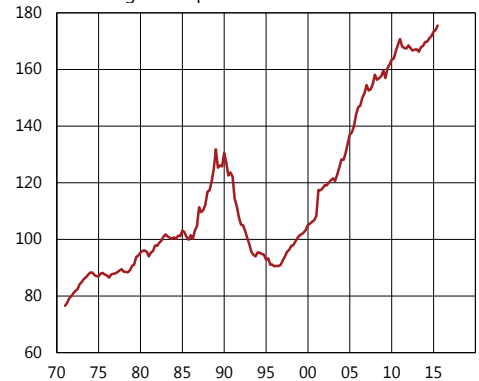
Vulnerabilities and risks linked to high housing prices and high indebtedness

The low interest rates are also contributing towards housing prices and indebtedness among households being expected to continue to rise above their already-high levels. Although household loans are now historically high in relation to incomes, their interest expenses in relation to income are the lowest in about 40 years (see chart 2:9 and 2:10). This has probably contributed towards the acceleration of prices on the housing market in recent years.

RAPIDLY INCREASING HOUSING PRICES MAY ENTAIL RISKS

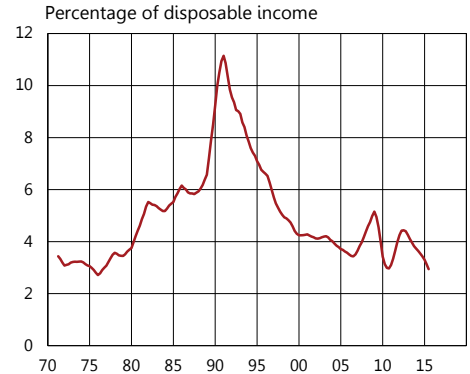
The trend of rapidly-increasing housing prices is no new phenomenon but has been underway since the mid-1990s (see chart 2:11). In addition, prices have increased rapidly in most regions of Sweden,

Chart 2:9 Households' debts in Sweden
Percentage of disposable income



Sources: Statistics Sweden and the Riksbank

Chart 2:10 Household interest expenditure in Sweden
Percentage of disposable income



Note. Interest expenditure is after tax.
Sources: Statistics Sweden and the Riksbank

Chart 2:11 Real residential real estate index
Index, firstQ1 2000 = 100



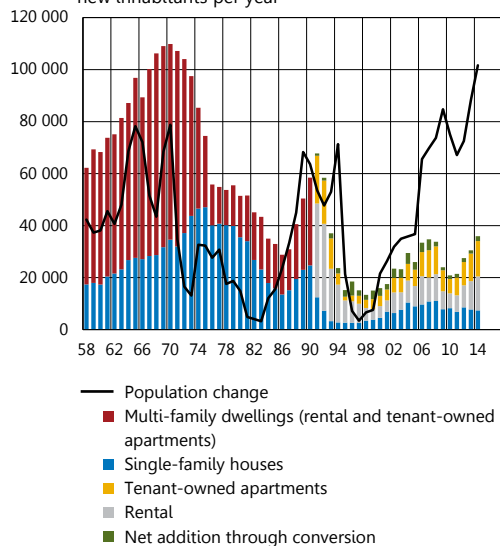
Note. Housing prices have been seasonally adjusted.
Sources: Valueguard and the Riksbank

²¹ For new bonds, issuers may also adjust the price so that the variable coupons are not likely to be negative. See also *Financial Infrastructure Report 2015*. Sveriges Riksbank.

²² *Market participants' views on risks and the functioning of the Swedish fixed-income and foreign exchange markets*, autumn 2015. Sveriges Riksbank.

Chart 2:12 Housing construction and population changes in Sweden

Number of housing units completed and number of new inhabitants per year



Sources: Statistics Sweden and the Riksbank

not just in the major cities. There are several different explanations for this price development. In addition to the ever-lower level of interest rates, households have benefited from rising incomes and changes in taxation. Prices have also been pushed up by the failure of the housing supply to increase to the same extent as demand. Housing shortages have been reported from several parts of the country. At the end of the 1990s, 11 per cent of municipalities said that there was a housing shortage, a proportion that is now over 40 per cent. In particular, there is a shortage of rental housing. In 2013, for example, 246 municipalities, or almost 85 per cent, reported a lack of rental accommodation.²³

The shortage of housing has several causes. These include the regulations for the rental market, which contribute towards existing housing not being utilised efficiently, resulting, among other consequences, in long queues for households applying for rental housing. Another reason is that housing construction in Sweden has been low in recent decades, both from a historical perspective and in relation to the requirements created by the rapidly-rising population and urbanisation.²⁴ This has meant that the housing surplus previously existing in several metropolitan regions has successively decreased in step with the increase of the population (see chart 2:12).²⁵ Housing construction has certainly increased in recent years, but the present rate is still not deemed to be sufficient to meet the future population increase in Sweden. The population is expected to increase at a brisk pace in the years ahead.²⁶ This could put extra pressure on house prices and increase indebtedness in the household sector.

This rapid price increase entails risks. One risk is that households will adjust their expectations of future interest rates and housing prices to the prevailing low interest rate situation and the price increases seen in recent years.²⁷ A situation in which interest rates rise faster and exceed household expectations may risk leading to falling housing prices. Falling house prices may, in turn, lead to expectations of further price decreases, thus fuelling an already negative development.

The overall assessment from the analysis of several different models employed by the Riksbank indicates that the Swedish housing market is highly valued at present and that there is thus an increased probability of a fall in housing prices (see the article Asset valuations and financial stability).

²³ *The Housing Market 2013–2014*, The Swedish National Board of Housing, Building and Planning.

²⁴ There are several explanations for the low level of housing construction in Sweden. These include, for example, demanding land and planning processes, the municipalities' planning monopoly, limited access to land ready for development, a lack of competition in the civil engineering and construction sectors, regulations on the rental market and current legislation which facilitates appeals and places considerable demands on the quality of the housing being built.

²⁵ See, among others, Bergendahl, P., Hjeds Löfmark, M. and Lind, H. (2015), *Bostadsmarknaden och den ekonomiska utvecklingen* (The housing market and economic development), Appendix 3 to *Långtidsutredningen* (Long-Term Survey of the Swedish Economy) 2015, SOU 2015:48, Emanuelsson, R. (2015), *Utbudet av bostäder i Sverige* (The supply of housing in Sweden), *Economic Review* 2:2015. Sveriges Riksbank. Bokriskskommittén (Housing Crisis Committee) (2014), *En fungerande bostadsmarknad – en reformagenda* (An efficient housing market – an agenda for reform), and Nybyggarkommissionen (The New Construction Commission) (2014), *En bostadspolitisk agenda för Sverige – 63 förslag för ökat byggande* ("A housing policy agenda for Sweden – 63 proposals for increased construction").

²⁶ The future population of Sweden 2015–2060, *Demographic reports* 2015:2. Statistics Sweden.

²⁷ For example, an investigation conducted by Avanza and Sifo in the autumn of 2015 indicated that 200,000 Swedes will be unable to meet the interest rate increases predicted by the Riksbank in the years ahead.

HIGH HOUSEHOLD INDEBTEDNESS IS INCREASING RISKS

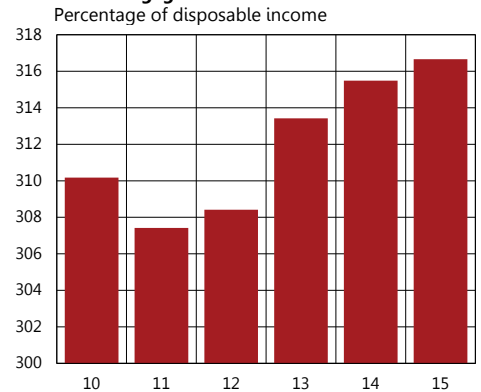
The rapidly-rising housing prices have gone hand in hand with ever-higher indebtedness in the household sector. In Sweden, the total debt-to-income ratio, which is to say debts in relation to disposable incomes, is currently at about 175 per cent, which is a high level from both historical and international perspectives. If only households with mortgages are considered, the average debt-to-income ratio amounts to 317 per cent, in addition to which the statistics indicate that 27 per cent of these households have a debt-to-income ratio exceeding 400 per cent, while 11 per cent have a debt-to-income ratio exceeding 600 per cent (see chart 2:13 and 2:14).

Households that are highly-indebted are sensitive to shocks in the economy. Such shocks can include a fall in housing prices, but may also include other events changing the cash flow, such as decreasing incomes or increasing interest payments. This may force households to cut down on consumption and saving to service their mortgages. If there arises a situation in which households cannot service their mortgages at the same time as housing prices are falling, the banks that have lent money to households may be impacted by loan losses. The high level of indebtedness may thus have direct consequences for financial stability. Historically, however, such loan losses have been very small in Sweden.

Instead, macroeconomic risks are deemed to form the greatest direct risk inherent in excessive indebtedness. If enough households reduce their consumption at the same time, the effect on overall consumption may restrain growth in the economy as a whole. In this way, high indebtedness may threaten macroeconomic stability. Examples of this could be seen in the last crisis, when consumption decreased more in countries with high levels of indebtedness than in countries with low levels of indebtedness (see chart 2:15). Historical experiences show that sharp falls in asset prices combined with extensive private indebtedness have contributed to deep and long-term recessions.

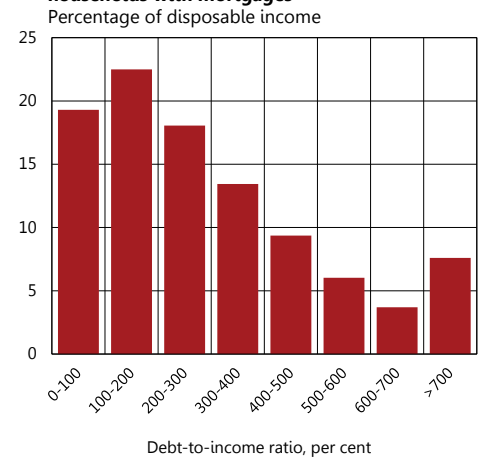
Financial stability can also be indirectly affected. If household consumption decreases substantially, it is likely that the profitability of the corporate sector will also decrease. This may, in turn, entail more bankruptcies and increased loan losses on the banks' lending to companies. In addition, a deterioration in economic prospects may lead to decreasing confidence in the Swedish banks. This could lead to the banks finding it more difficult to obtain funding on the market. Mere fears of falling housing prices, for example, can lead to the banks' access to funding becoming impaired. The risk of this would probably increase with higher indebtedness. High indebtedness can thus impact financial stability both directly and indirectly. As the Swedish banks' exposures to the housing market are large, the increased risks on the housing market and in the household sector also lead to increased risks for the banks. The high level of debt among households in Sweden, combined with highly-valued asset prices, mean there is a high level of vulnerability for both households and

Chart 2:13 Average debt for Swedish households with mortgages



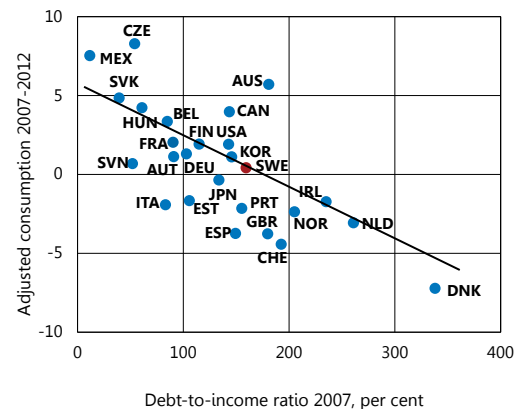
Note. Mean value for indebted households in July each year
Source: The Riksbank

Chart 2:14 Distribution of debt for Swedish households with mortgages



Source: The Riksbank

Chart 2:15 Relationship between debt-to-income ratio and consumption growth between 2007 and 2012



Note. Adjusted consumption growth has been calculated as actual consumption growth minus contributions from growth in debt ratio, current account and consumption. For further information, see Flodén, M. (2014), Did household debt matter in the Great Recession?
Sources: The OECD and the Riksbank.

the banking system. A fall in housing prices could therefore have significant consequences for both financial stability and the real economy.

■ 3. Recommendations

Rising housing prices and ever higher household indebtedness are contributing to increasingly greater risks to both financial and macroeconomic stability, while vulnerabilities also remain in the banking system. It is therefore becoming increasingly urgent to take measures to mitigate these risks. Measures that tackle the underlying causes of increased indebtedness are required, such as reforms to boost the supply of housing and reduced tax relief on interest expenditure. Another possible measure that can reduce the risks of household indebtedness is the introduction of a debt-to-income limit. It is also of the utmost importance that the Government and the Riksdag clarify Finansinspektionen's mandate and tools for macroprudential policy as soon as possible. It is important that the necessary measures can be implemented. In addition to this, capital requirements need to be tightened in order to strengthen the resilience of Swedish banks. The major banks should also continue to reduce their liquidity risks.

The Riksbank's assessment is that there are vulnerabilities in the financial system that are making it sensitive to various shocks (see Chapter 2). The present assessment is that these shocks may primarily arise and be amplified by high valuations on asset markets, especially on the Swedish housing market, as well as by Swedish households' high indebtedness. This chapter describes the measures that the Riksbank currently considers to be key to reducing the vulnerabilities and risks (see table 3:1).²⁸

To reduce the risks of high household indebtedness and rising housing prices, the Riksbank deems a number of different measures necessary. Actions are needed that tackle the underlying causes of increased indebtedness. For example, measures are needed that target the housing market in order to create a better balance between supply and demand. This would slow down the increase in housing prices and thereby reduce indebtedness. Reforms that make households less willing to take on debt are also important, such as a gradual reduction of the tax relief on interest expenditure. The responsibility for such reforms lies with the Riksdag and the Government. It is also of the utmost importance that the Government and the Riksdag bring clarification to FI's mandate for macroprudential policy. FI should be independently able to decide on macroprudential policy issues. This is a pre-condition for FI to be able to pursue an effective macroprudential policy. Regarding the need for macroprudential policy measures, the Riksbank feels that an amortisation requirement is a step in the right direction. However, additional measures are needed to tackle the risks associated with household indebtedness. A case in point is the introduction of a debt-to-income limit.

The Riksbank also considers it necessary for the capital levels in the banking system to increase. That would strengthen the resilience of the banks and reduce their sensitivity to shocks. In addition, it is important that the banks reduce both their liquidity risks in SEK and their structural liquidity risks.

²⁸ For recommendations that have been fulfilled, see table 3:4.

If no measures are taken, this, in combination with the low level of interest rates, will further increase the risks, which may potentially lead to economic imbalances and in the long term be very costly for the national economy.

Table 3:1 The Riksbank's current recommendations

<i>The mandate for macroprudential policy</i>	Issued
The Government and the Riksdag should promptly clarify Finansinspektionen's mandate and instruments for macroprudential policy.	Financial Stability Report 2015:1
Household indebtedness	
The Government and responsible authorities should take further measures as soon as possible to reduce the risks in the household sector. These measures should affect both the existing loan stock and new loans. Examples of measures include a reduction in the tax relief on interest expenditure and the introduction of a debt-to-income limit. A central component is also action to improve the functioning of the housing market.	Financial Stability Report 2015:2
The Government and the Riksdag should also, as soon as possible, work to enable the introduction of an amortisation requirement for new mortgages.	Financial Stability Report 2015:1
Finansinspektionen should ensure that sound minimum levels are introduced for the standard values that the banks use in their discretionary income calculations.	Financial Stability Report 2014:1
The banks' capital levels	
Finansinspektionen should introduce as soon as possible a leverage ratio requirement for major Swedish banks at the group level of 4 per cent. The requirement should be set at 5 per cent from January 2018.	Financial Stability Report 2014:2
Finansinspektionen should set the countercyclical capital buffer value at 2.5 per cent with the aim of increasing the banks' resilience.	Financial Stability Report 2014:1
The major banks' liquidity risks	
Finansinspektionen should extend requirements for the Liquidity Coverage Ratio (LCR) to also cover Swedish kronor (SEK). The requirement should be set at 60 per cent.	Financial Stability Report 2014:1
The major Swedish banks should reduce their structural liquidity risks and meet the minimum level of 100 per cent in the Net Stable Funding Ratio (NSFR).	Financial Stability Report 2011:2
The major Swedish banks should report their LCR in SEK at least once a quarter.	Financial Stability Report 2013:2
The major Swedish banks should report their NSFR at least once a quarter.	Financial Stability Report 2013:1

RECOMMENDATION REGARDING THE MANDATE FOR MACROPRUDENTIAL POLICY

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

In Sweden, the Government has allocated the main responsibility for macroprudential policy to FI.²⁹ It has become evident, however, that the regulations do not give FI a sufficiently clear assignment to take measures to counteract financial imbalances. This lack of clarity is delaying and obstructing the introduction of necessary measures to manage the risks posed by household indebtedness. It is therefore of the utmost importance that FI's mission and instruments for macroprudential policy are clarified and set out in law. The mandate should also make it clear that FI has a mandate to take measures to counteract financial imbalances even when there are no immediate

²⁹ See, for example, Finansinspektionen's instructions (SFS 2013:1111) (In Swedish only) and DN Debatt "Tuffare regler för bankerna krävs för finansiell stabilitet" [Tougher rules for banks required for financial stability] (In Swedish only), Dagens Nyheter, 26 August 2013.

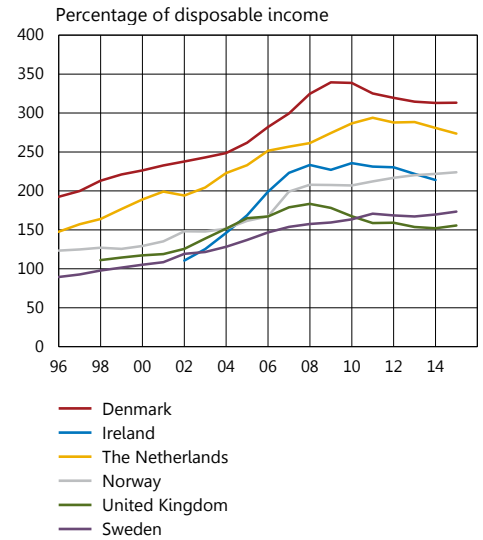
risks to financial stability, but rather risks to macroeconomic development. FI should be independently able to decide on macroprudential policy issues. This is a pre-condition for pursuing effective macroprudential policy in Sweden.³⁰

RECOMMENDATION REGARDING MEASURES TO REDUCE RISKS LINKED TO HOUSEHOLD INDEBTEDNESS

The Government and responsible authorities should take further measures as soon as possible to reduce the risks in the household sector. These measures should affect both the existing loan stock and new loans. Examples of measures include a reduction in the tax relief on interest expenditure and the introduction of a debt-to-income limit. A central component is also action to improve the functioning of the housing market.

High and increasing indebtedness poses risks to both individual households and the economy as a whole. Other countries with similar problems have taken a range of measures to mitigate the risks associated with rising housing prices and debts in the household sector (see table 3:2 and chart 3:1). Measures to dampen household demand for loans are common. Examples include abolishing or reducing tax relief on interest expenditure and introducing loan-to-value and debt-to-income limits. Measures to strengthen banks' resilience have also been taken, including raising risk weights for mortgages.

Chart 3:1 Households' debts in a sample of other countries



Sources: The OECD

Table 3:2 Measures that have been taken since the financial crisis in a sample of other countries

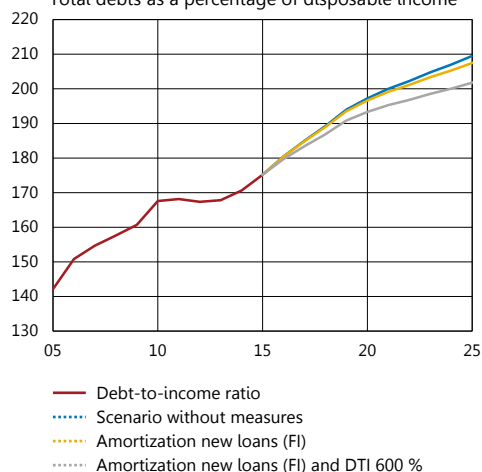
	<i>Risk weights</i>	<i>Loan-to-value limit</i>	<i>Debt-to-income limit</i>	<i>Reduced tax relief on interest expenditure</i>
Denmark		95 %.		1 % reduction per year until 2019 from 33 % to 25 %.
Ireland		90 % for first time buyers, 80 % for others.	Max 20 % of new mortgage may have a debt-to-income ratio over 350 %.**	
Netherlands		1 percentage point reduction per year to 100 % in 2018.		0.5 percentage point reduction per year from 52 % to 38 % in 2042 and an amortisation requirement in order to receive the tax relief.***
Norway	Regulatory floors for LGD* of 20 %.	85 %.		Reduction in the general tax rate from 28% in 2014 to 25 % in 2016.****
United Kingdom			Max 15 % of new mortgage may have a debt-to-income ratio over 450 %.**	

Note. *LGD (Loss Given Default) is a risk parameter in the calculation of risk-weighted assets and specifies the loss given a default by a counterparty. **The debts are set in relation to gross income. ***In contrast to Sweden, the interest rate deduction in the Netherlands means that mortgage interest payments are subtracted from the taxable income. ****The reduction in the general tax rate entails cutting tax deductions for interest expenditure to a corresponding degree. Sources: National central banks, the ESRB and the ECB

³⁰ See also the Riksbank's consultation response to the Amortisation Requirement Memorandum, October 2015, Sveriges Riksbank. And Recommendation of the European Systemic Risk Board of 22 December 2011 on the macroprudential mandate of national authorities (ESRB/2011/3).

Chart 3:2 Scenarios of how the aggregated debt-to-income ratio may develop with and without macroprudential measures

Total debts as a percentage of disposable income



Note. DTI is an abbreviation for Debt-To-Income ratio.

Sources: Statistics Sweden and the Riksbank

In Sweden, FI has taken certain measures such as the introduction of a loan-to-value limit and risk-weight floors for mortgages. These measures are a step in the right direction but developments show that they are insufficient. This is why additional measures are needed within several different policy areas. An important starting point in this work is to tackle the underlying causes of increased indebtedness. It could, however, take time to implement and see the effects of some of these measures, including reforms of the housing market. It is therefore essential that reform work be accelerated and that other measures are also taken to mitigate the risks in the short term.

A poorly functioning housing market is one factor that has contributed to the build-up of risk. To reduce the risks of household indebtedness, it is necessary to implement reforms on the housing market to increase supply, and thereby create a better balance between supply and demand. Such reforms would slow down the increase in housing prices and thereby reduce indebtedness. Measures that increase housing supply should therefore be allocated priority. It may, for example, be a question of reforming the rent-setting system and of improving competition in the construction and civil engineering sector. In addition, municipal planning and building rules may need to be reviewed. In Sweden, for example, the municipal monopoly on planning also means that the municipalities themselves determine how land should be used and developed. This may mean that the supply of land does not increase enough from a broader socioeconomic perspective.³¹ It would also be desirable to conduct a review of property taxation, for example to reduce lock-in effects.

Favourable tax regulations for homeowners, for example tax relief on interest expenditure and property tax cuts, have also contributed to the build-up of debt. These tax rules should therefore also be reviewed. For example, a gradual reduction of the tax relief on interest expenditure would help to dampen household demand for loans and thus indebtedness. The advantage of such a measure is that it also affects the existing stock of mortgages, since a lower tax relief on interest expenditure provides an incentive to increase mortgage repayments.

Other measures are needed however to prevent indebtedness from continuing to rise. How great this need is depends on the extent to which the underlying causes of the increased risks are tackled and how quickly this takes place. The Riksbank considers an amortisation requirement to be a step in the right direction, and welcomes the Government's proposal for new legislation (see below). However, other measures are also needed since the amortisation requirement presentation by FI this spring is only having marginal effects (see chart 3:2).³² One could, for example, put limits on what proportion of banks' loan portfolios may consist of highly indebted households. One way of doing this is to introduce a debt-to-income

³¹ Emanuelsson, R (2015), Supply of housing in Sweden, *Economic Review* 2015:2. Sveriges Riksbank.

³² See Proposal for new rules on an amortisation requirement for mortgages, *consultation memorandum*, FI Dnr 14-16628, March 2015. Finansinspektionen.

limit that restricts how much a household may borrow in relation to its income. This is a good complement to the existing loan-to-value limit and the proposed amortisation requirement, as it is not directly affected by rising housing prices. An upward spiral, in which higher housing prices lead to larger loans which in turn enable even higher housing prices, can thus be avoided.

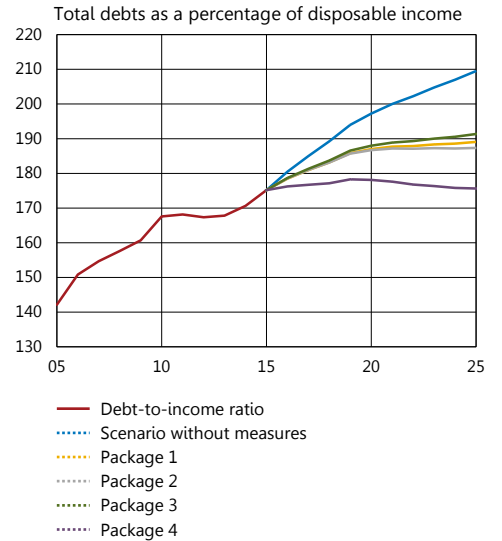
Other feasible reforms are the reduction in the loan-to-value limit and the requirement for households to have more of a financial buffer when they are granted mortgages (see more below in the Riksbank's recommendation for the banks' credit assessments). Another option is to increase the risk-weight floor for mortgages. A risk-weight floor of, for example, 35 per cent 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 for the calculation of risk weights for mortgages.

Arithmetical calculations of different combinations of measures

In order to dampen the increase in debt and reduce the risks in the household sector in a gradual and balanced way, the Riksbank's assessment is therefore that several different measures are needed, which impact both new loans and the existing loan stock. To give an idea of the size of measures that may be needed, scenarios are shown in chart 3:2 and 3:3 for how households' aggregated debt-to-income ratio may develop up until 2025 if no other measures are taken, and how it may develop if individual or different packages of measures are taken (see table 3:3).³³ It is important to emphasise in this context that the calculations that stretch such a long time into the future are very uncertain. The calculations are also based on a number of assumptions and simplifications. The analysis is also partial, which means that there is not feedback between, for example, the effect on debts and household income.

According to chart 3:3, several of the packages of measures are leading to debts in relation to disposable income rising considerably more slowly than when no measures are taken. Three of the packages dampen the increase in the aggregated debt-to-income ratio in approximately the same way. The arithmetical examples illustrate therefore that different measures are interchangeable. In this context, it is important to emphasise that there is also interchangeability between macroprudential measures and reforms on the housing market. The example where tax relief on interest expenditure is totally abolished, without any gradual reduction, has the greatest effect on the debt-to-income ratio. In this case, the debt-to-income ratio is stabilised at its current level. Achieving this requires the

Chart 3:3 Proposals for different packages of measures to stabilise the development of the debt-to-income ratio



Note. The chart shows the scenarios described in table 3:3. Sources: Statistics Sweden and the Riksbank

Table 3:3 Proposals for different packages of measures

	<i>Amortisation requirement</i>	<i>Tax relief on interest expenditure</i>	<i>Debt-to-income limit</i>
Package 1	According to FI's proposal	Reduction to 15 per cent over 15 years	500 per cent, 15 per cent of the loan volume to be exempt
Package 2	40 years on new mortgages	Reduction to 15 per cent over 15 years	600 per cent
Package 3	According to FI's proposal	Reduction to 20 per cent over 10 years	500 per cent, 15 per cent of the loan volume to be exempt
Package 4	According to FI's proposal	Abolished	600 per cent

Note. Debt-to-income limit refers to a limitation to how much households may borrow in relation to their disposable income. Under the exemption, banks can choose to allow 15 per cent of new lending to have a debt-to-income ratio over a certain level.

³³ The long-term scenario is based on the forecast which was published in the October 2015 Monetary Policy Report, and assumes that GDP and consumption after 2018 will rise at a normal pace, and that CPI inflation is close to 2 per cent. The repo rate will start to be raised during the first half of 2017 and will then rise towards a long-term level of close to 4 per cent. The rising interest rate is subduing the development in households' disposable income, housing prices and debts. The increase in the debt-to-income ratio will therefore be slightly slower from 2018 onwards than in previous years, and will reach a level of around 210 per cent.

introduction of both the FI's amortisation requirement and a debt-to-income limit of 600 per cent and the total abolition of the tax relief on interest expenditure, without any gradual reduction.

These measures aim to dampen indebtedness and reduce the risks in the economy. But at the same time, they will also dampen economic activity in the short term, since households are expected to reduce their consumption somewhat. The effect on the economy can be mitigated, however, by feeding back the economic resources released by the reduction in the tax relief to households. If these resources are fed back to high-consumption households, the reduction in consumption can be significantly mollified.

All in all, the Riksbank considers the implementation of further measures to reduce the risks of household debt to be of the utmost importance as these can result in large-scale costs for the economy should they materialise. Exactly what measures are taken is not the determining factor as long as they reduce the risks of high household indebtedness. It is important that the measures are not delayed and that they are implemented in a way that the stability risks do not increase in the short term.

The Government and the Riksdag should urgently work to make it possible to introduce an amortisation requirement for new mortgages.

In its previous stability report, the Riksbank recommended that the Government and the Riksdag should urgently work to enable the introduction of an amortisation requirement into Swedish law. Since this previous report was published, the Government has presented a proposal for new legislation on an amortisation requirement. It is proposed that the bill enter into force on 1 May 2016. It may take some time, however, before FI's amortisation requirement provisions are in place. The Riksbank's recommendation therefore remains. Meanwhile, the banks should ensure that households amortise their mortgages, at least in accordance with the amortisation requirement proposal presented by FI in 2014.³⁴

Finansinspektionen should ensure that sound minimum levels are introduced for the standard values that banks use in their discretionary income calculations.

Banks are 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. There are currently major differences, however, in the standard values banks use in these calculations.³⁵ This means that different banks assess borrowers'

³⁴ See FI's view on an amortisation requirement in a memorandum presented in connection with the meeting of the Financial Stability Council on 11 November 2014. See *Financial Stability Report 2014:2*. Sveriges Riksbank. And the Riksbank's consultation response to the Amortisation Requirement Memorandum, 21 October 2015. Sveriges Riksbank.

³⁵ There are significant differences in the standard values that banks use in their discretionary income calculations. For example, the cost of capital that banks require borrowers to cope with varies. There is also considerable variation in both the principal repayment and the cost of living to be adopted for different types of households.

economic margins in different ways. Stipulating minimum levels for the standard values in the discretionary income calculations could ensure that borrowers will at least be able to cope with certain levels of lending rates, amortisation rates and living costs, regardless of which bank issues the loan. Establishing minimum levels could also help to strengthen households' resilience by creating larger financial buffers and subduing loan growth.

RECOMMENDATIONS REGARDING BANKS' CAPITAL LEVELS

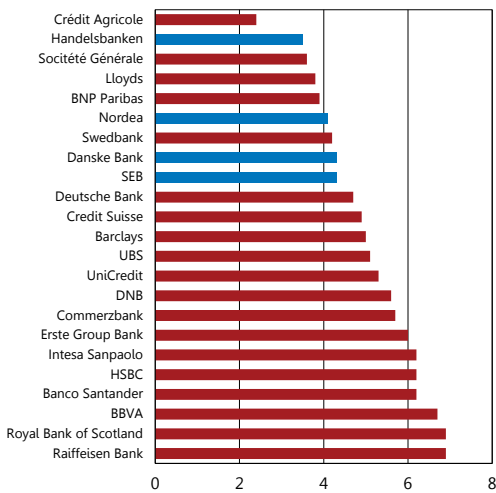
Finansinspektionen should introduce, as soon as possible, a leverage ratio requirement for major Swedish banks at the group level of 4 per cent. The requirement should be set at 5 per cent from January 2018.

As was made clear in Chapter 2, there are a number of risks and vulnerabilities in the Swedish banking system. The banks' capital levels need to increase for them to be resilient enough to withstand these. A bank's capital strength can be measured in different ways. A risk-based capital measure is often used. One problem is however that the banks' risk exposure amount and the risk weights used to calculate this amount do not always reflect the actual risks in a satisfactory manner. Major differences have also been shown to exist in the banks' risk weights even for identical portfolios, which means that capital ratios are not entirely comparable between different banks.³⁶ It has therefore become increasingly common to focus more on capital measures that are not risk-based. The leverage ratio, which is part of the framework of Basel III, is one such measure. The leverage ratio puts the banks' capital in relation to their total assets. By placing a minimum leverage ratio requirement, a limit is created for how much the banks can expand their balance sheets. Furthermore, it can help to reduce uncertainty as regards whether the banks' risk weights do in fact reflect the actual risks. A leverage ratio requirement can also reduce incentives that can ultimately lead to systemic risks. Banks strive to maximise their shareholders' returns. It gives them an incentive to attempt to reduce their risk weights, since this gives a lower capital requirement. This, in turn, can lead to banks holding too little capital. Many banks acting in the same way could cause a build-up of significant systemic risks.

The Basel Committee has introduced a minimum international leverage ratio requirement. The level is to be determined in 2016 and the requirement will come into force in 2018. The EU is expected to introduce the requirement in the form of a binding rule. A number of countries, including the United Kingdom, Switzerland and the United States, have already implemented, or will soon implement, leverage ratio requirements. In international contexts, it is also being discussed whether banks need to have more capital so that they can cope with losses and whether their risk-weights need to be reviewed.

³⁶ See, for example, the study *Analysis of risk-weighted assets for credit risk in the banking book*, July 2013. Basel Committee.

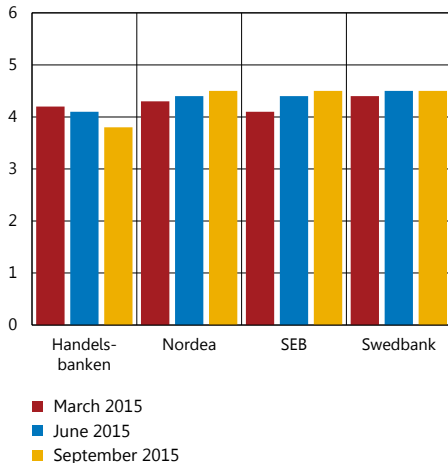
Chart 3:4 Capital in relation to total assets
September 2015, per cent



Note. The measure has been defined by SNL Financial as an estimate of banks' leverage ratio and refers to Tier 1 capital in relation to total assets, excluding derivatives.

Sources: SNL Financial and the Riksbank

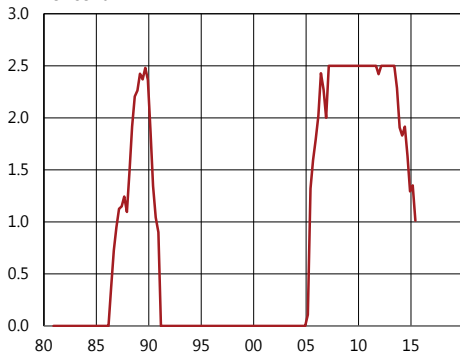
Chart 3:5 Reported leverage ratio
Per cent



Note. According to the CRR.

Sources: Bank reports

Chart 3:6 The countercyclical buffer rate according to the Basel Committee's standard method
Per cent



Note. The countercyclical buffer value for exposures in Sweden is based on a mechanical application of the credit gap according to the BIS standard method. The credit gap shows how much the credit-to-GDP ratio deviates from its statistical trend.

Source: The Riksbank

Among other things, the Basel Committee is currently working on a proposal to limit the scope of banks to use internal models for certain types of portfolios and on designing rules that set a floor for how low banks' risk weights can be. This is to ensure that banks have sufficient capital and that variations in banks' risk weights do not become too large.

The major Swedish banks are well capitalised in relation to the risk-based capital adequacy requirement but their leverage ratio is relatively low compared with many other European banks (see chart 3:4). To increase the resilience of Swedish banks, it would therefore be justifiable to move forward the introduction of a Swedish leverage ratio requirement as a complement to the risk-based capital requirements.

The requirement should as soon as possible be set at four per cent and then to five per cent from 2018.³⁷ Three of the four major banks are currently at four per cent or just above (see chart 3:5). To meet a requirement of five per cent, all major banks will need to strengthen their balance sheets, for example by increasing their capital with retained profits. The Riksbank's calculations show that the major banks will be able to distribute 60 per cent of their forecast profits and still have a leverage ratio around or over five per cent in 2018.

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

The countercyclical capital buffer aims to strengthen the resilience of Swedish banks when systemic risks accumulate but before they materialise. At present, the countercyclical buffer guideline value according to the Basel Committee's standard method indicates that the Swedish countercyclical capital buffer should be 1.0 per cent (see chart 3:6). FI has proposed that the buffer shall be set at 1.5 per cent from 27 June 2016. However, the Riksbank assesses that the countercyclical capital buffer should instead be set at 2.5 per cent. The Riksbank's assessment is based on the fact that the method which sets the guideline value does not fully capture the current risks in the Swedish financial system. The standard method used to calculate the buffer guideline value has a number of known shortcomings. For example, it is underestimated for countries that have experienced rapid credit growth over a longer period.³⁸ This is because the credit gap, i.e. the difference between actual lending and its trend, is used as a reference point for calculating the guideline value. If the credit-to-GDP ratio has increased substantially over a long period, this will also lead to a higher trend and a narrower credit gap due to the method of calculation (see chart 3:7).³⁹

The reason why the Riksbank thinks that the buffer should be higher than 1.0 per cent is that the systemic risks in Sweden are

³⁷ According to the Basel Committee definition.

³⁸ See the consultation response to *Proposed amendments to Finansinspektionen's regulations on countercyclical capital buffer value*, June 2015. Sveriges Riksbank.

³⁹ The countercyclical capital buffer. *Financial Stability Report 2014:1*. Sveriges Riksbank.

currently high and are also showing signs of continuing to rise. The rate at which both housing prices and lending to households are rising has continued to increase in the past twelve months. At the same time, the expectations are that housing prices will continue to rise in the period ahead.⁴⁰

Raising the Swedish countercyclical capital buffer to 2.5 per cent would have only a marginal effect on the major banks' capital requirements at group level. In relation to total assets, it is a question of only a few tenths of a percentage point. On the other hand, increasing the capital requirements sends an important signal and helps to maintain confidence in the Swedish banking system.

RECOMMENDATIONS REGARDING THE MAJOR BANKS' LIQUIDITY RISKS

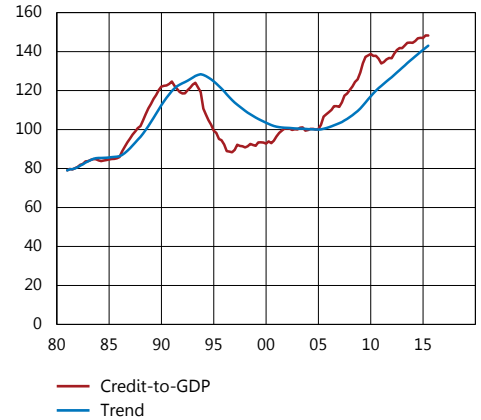
Finansinspektionen should extend requirements for the Liquidity Coverage Ratio (LCR) to also cover Swedish kronor (SEK). The requirement should be set at 60 per cent.

The major Swedish banks have relatively small liquidity buffers in SEK. To avoid situations whereby large outflows of SEK lead to unnecessary liquidity risks, it is important to ensure that the banks have a certain minimum level of liquid assets in SEK. The Riksbank therefore recommends that FI extend the current LCR requirements to also include a requirement in SEK. The background to this recommendation is that the major Swedish banks' LCRs in SEK have been low, and sometimes extremely low. This indicates that the buffers the banks have to be able to cope with unexpected cash outflows in SEK are too small.

Since the Riksbank issued this recommendation, the major banks' LCRs in SEK have indeed improved and, on average, are above the recommended minimum level of 60 per cent. It is important, however, that the LCRs in SEK, as for the other currencies for which there are requirements at present, are met at every point in time, that is daily. Today, the LCRs in SEK of certain banks are periodically far below 60 per cent (see chart 3:8).

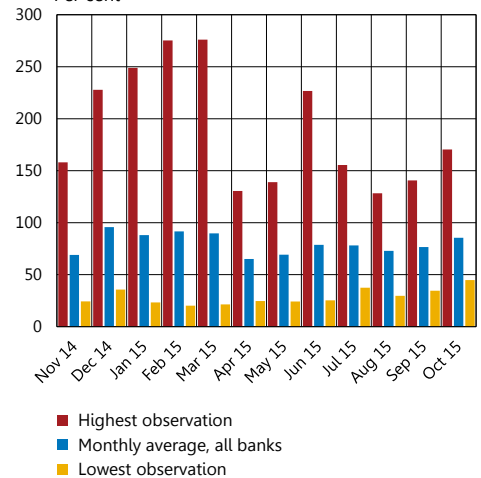
The Riksbank therefore considers that there are still reasons for FI to extend the current LCR requirements to also include a requirement in SEK. The recent general improvement in the major banks' LCRs in SEK also indicates that there are no significant obstacles on the financial markets to introducing a requirement of at least 60 per cent.

Chart 3:7 The credit-to-GDP ratio and statistical trend according to the Basel Committee's standard method
Per cent



Note. Credit is defined as monetary financial institutions' lending to the private non-financial sector and the outstanding stock of certificates and bonds issued by the Swedish private non-financial sector. GDP is in nominal terms and is defined as the sum of GDP for the four last quarters. The statistical trend is calculated using a one-sided HP filter with the smoothing parameter equal to 400,000.
Source: The Riksbank

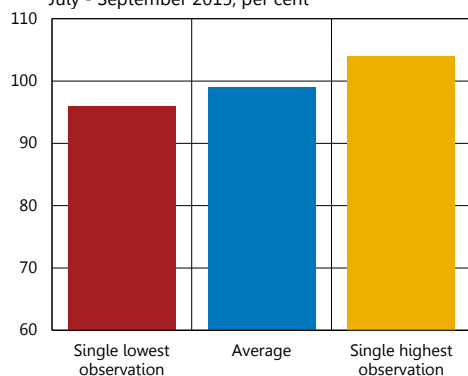
Chart 3:8 The major Swedish banks' daily LCRs in SEK
Per cent



Note. The major Swedish banks' average daily LCR in SEK per month, and the single highest and lowest observations each month.
Source: The Riksbank

⁴⁰ According to SEB's housing price indicator, the majority of households asked believe that housing prices will continue to rise over the coming year, see *Housing Price Indicator*, October 2015. SEB.

Chart 3:9 The major Swedish banks' lowest, average and highest monthly NSFRs
July - September 2015, per cent



Note. Every month the Riksbank collects the major banks' NSFRs in accordance with the Basel Committee's final definition. The chart shows both the average and the highest and lowest observations for the third quarter of 2015.

Source: The Riksbank

The major Swedish banks should report their Liquidity Coverage Ratios (LCR) in SEK at least once a quarter.

The major Swedish banks already report the LCR of all currencies together and separately in euros and US dollars. By supplementing the present reporting with a separate report of the LCR in SEK, the banks could provide a better picture of their liquidity risks in different currencies. At present, only Swedbank reports its LCR in SEK every quarter. These reports say nothing about whether the LCR has varied during the quarter, however; they only state the value that applied on the last day of the quarter. As the major Swedish banks periodically have an LCR which is below 60 per cent (see chart 3:8), the reported value may overestimate the bank's ability to cope with short-term liquidity stress. For the report to be appropriate and give an accurate picture of a bank's liquidity risk, it is important that the quarterly report makes it clear that the bank has achieved an LCR of 60 per cent each day.

The major Swedish banks should reduce their structural liquidity risks and meet the minimum level of 100 per cent in the Net Stable Funding Ratio (NSFR).

The NSFR is an internationally agreed measure that makes it possible to monitor the development of structural liquidity risks over time and between banks. The structural liquidity risks of the four major banks are relatively high in an international perspective. During the third quarter of 2015, the major Swedish banks had an average NSFR of 99 per cent. The lowest and highest observations during the period were 96 and 104 per cent respectively (see chart 3:9). According to the Basel Committee's timetable, banks have to meet a minimum NSFR level of 100 per cent from 2018. However, many banks in Europe are already slightly above a level of 100 per cent and the comparatively low levels of the major Swedish banks currently stand out.

It is reasonable to expect banks with a large share of wholesale funding, such as the Swedish banks, to ensure that they fulfil this requirement as soon as possible. Additionally, the potential for the major banks to improve their NSFRs is favourable at present as they can get low-cost funding at long maturities. The major banks should therefore continue to reduce their structural liquidity risks and reach the minimum NSFR level of 100 per cent as soon as possible.

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

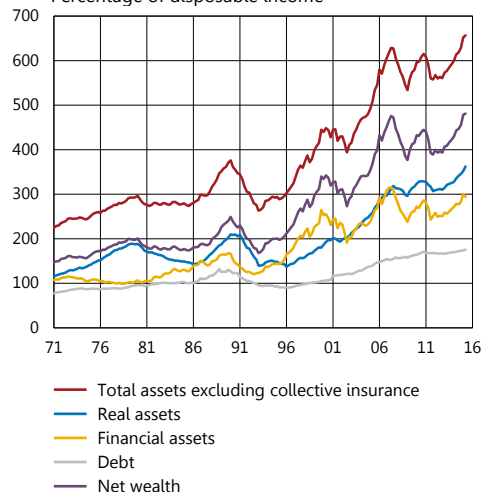
At present, Swedbank is the only one of the four major banks that publishes its NSFR. If the major banks consider that other measures better illuminate the structural liquidity risks they are taking, the Riksbank urges them to report these measures together with the NSFR.

Table 3:4 Recommendations that have been fulfilled

Recommendations	Issued	Observed
The major Swedish banks should report their leverage ratios at least once a quarter.	Financial Stability Report 2013:2	Financial Stability Report 2015:1
The risk weight floor for Swedish mortgages should be raised.	Financial Stability Report 2013:2	Financial Stability Report 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.	Financial Stability Report 2012:1	Financial Stability Report 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.	Financial Stability Report 2012:2	Financial Stability Report 2013:2
The major Swedish banks should improve the transparency of their public reporting as regards information on asset encumbrance.	Financial Stability Report 2012:2	Financial Stability Report 2013:1
The major Swedish banks should report comparable key ratios in the form of the subcomponents of the Liquidity Coverage Ratio (LCR).	Financial Stability Report 2011:2	Financial Stability Report 2013:1
The major Swedish banks' Liquidity Coverage Ratios (LCR) should amount to at least 100 per cent.	Financial Stability Report 2011:2	Financial Stability Report 2012:2
The major Swedish banks' Liquidity Coverage Ratios (LCR) should amount to at least 100 per cent in euro and US dollars respectively.	Financial Stability Report 2011:2	Financial Stability Report 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.	Financial Stability Report 2011:1	Financial Stability Report 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.	Financial Stability Report 2011:1	Financial Stability Report 2012:2

Asset valuations and financial stability

Chart A3:1 Household assets and debts
Percentage of disposable income



Sources: Statistics Sweden and the Riksbank

Like many other countries, the Swedish economy is currently in a period of low inflation. For this reason, monetary policy is currently expansionary and interest rates are low. Low interest rates can contribute to imbalances on various asset markets if they lead to assets being overvalued or different types of risk not being priced in full. This, in turn, could lead to increased vulnerability in the financial system. Against this background, this article investigates whether the current market valuations of equities, bonds and housing are high in relation to historical levels, and whether this could represent a threat to financial stability. The key indicators and assessments this article reviews indicate that both equities and housing are highly valued from a historical perspective and that the likelihood of falling prices is heightened. This represents a risk to financial and macroeconomic stability.⁴¹

Historically, economic crises caused by problems on the financial markets have been both deeper and longer than normal recessions.⁴² Problems on the financial markets are often linked to overvalued asset prices or risks not having been priced in full. This leads to a risk of rapid and unexpected price movements, which, in turn, could lead to stress on the financial markets, thereby also affecting financial stability. High asset prices, however, do not necessarily mean that prices will fall, but they do lead to greater risks and vulnerabilities in the economy.

The economic effects of falling asset prices differ among different types of asset. Sharply falling equity prices can weaken companies' and households' finances, and thereby affect financial and macroeconomic stability. However, a downturn on the equity market does not usually have as much of an effect in itself as, for example, falling housing prices, since equity holdings are normally less funded by loans than housing is. The sharp falls on the equity market which occurred in connection with the so-called "IT crash" at the beginning of the 2000s certainly affected household wealth (see chart A3:1), but had a limited effect on the rest of the Swedish economy. Research shows, however, that falling equity prices combined with high indebtedness can cause considerable problems. This will likely be the case to an even greater extent if the fall occurs at the same time as prices on the housing market fall.⁴³ The high indebtedness among households, principally in the form of mortgages, indicates that the high housing prices represent a clear risk. Prices on the bond market have a more direct effect on

⁴¹ This article is based upon Giordani, P., Grodecka, A., Kwan, S., Morales, P., Ölcer, D. and Spector, E. (2015), Asset valuation and financial stability, *Economic Commentaries*, no. 15, 2015. Sveriges Riksbank.

⁴² Reinhart C.M. and Rogoff K.S. (2009), *This Time is Different: Eight Centuries of Financial Follies*, Princeton University Press.

⁴³ See for example Brunnermeier, M.K., and Schnabel, I. (2015), Bubbles and Central Banks: Historical Perspectives, *CEPR working paper*.

companies' and banks' funding capabilities. The bond market is therefore also significant for financial stability in Sweden.

A fall in asset prices could occur for several reasons, but with the current low interest rates it is of particular interest to analyse how asset prices can react to a normalisation of the interest rate level.

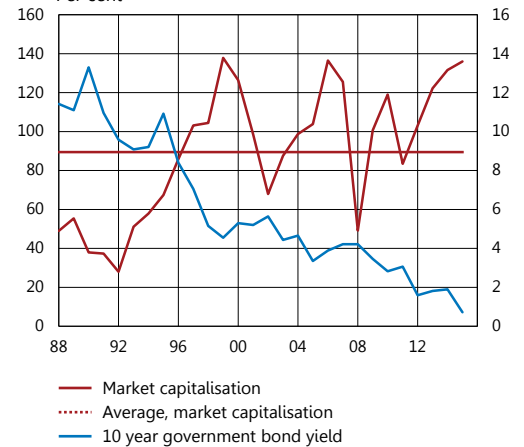
High equity market valuations

Both Swedish and international equity prices have risen rapidly over the past few years (see chart 1:1).⁴⁴ The question is whether this upturn can be considered justified and what the recent development means for future prices. In order to study the valuations of the equity market, it is normal to use various key indicators. Research shows that key indicators such as equity price in relation to profit and equity price and market value in relation to GDP are measures that can be used to predict the future returns of an asset in the medium to long term. The valuation of a stock should reflect investors' expectations of the future development of real stock dividends. Research indicates however that highly valued equities have lower future returns on average rather than higher growth in real dividends.⁴⁵ This indicates that the price is more affected by the discounting than by expectations of future dividends. The discounting can, in turn, be due to the real interest rate and risk premiums. This implies that a high valuation can to a certain extent be due to a low expected real interest rate. A risk in this context is that future real interest rates will be higher than expected. There is also research indicating that the valuation of equities is influenced by nominal interest rates, which is difficult to justify theoretically.⁴⁶

The valuation of the Swedish equity market, both in terms of equity prices in relation to GDP and market capitalisation in relation to GDP, is high from a historical perspective (see chart A3:2).⁴⁷ The valuation is currently around the same level as before the 2008 crisis and at the level reached in 1999 when the IT bubble was at its peak. Even though there has recently been a slight correction in Swedish equity prices, the valuation of the Swedish equity market remains high.

In conclusion, there are signs indicating that the equity market in Sweden are highly valued in a historical perspective and that returns can be expected to be lower in the future. Furthermore, there is reason to believe that an adjustment in equity prices could occur in relation to a normalisation of the interest rate level.

Chart A3:2 Market capitalisation in relation to GDP, Sweden
Per cent



Note. The chart is based on annual data (observed in September). Market capitalisation data after 2012 is based on the Riksbank's own estimates.

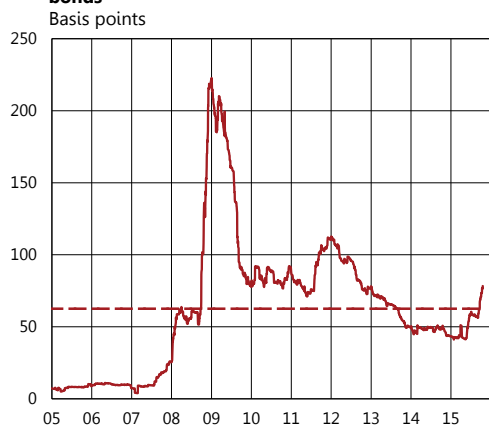
Sources: World Bank, Bloomberg and the Riksbank

⁴⁴ For an analysis of development and risks on international asset markets, See *IMF Global Financial Stability Report*, October 2015. International Monetary Fund

⁴⁵ See for example Campbell, J.Y. and Shiller, R.J. (1988), Stock prices, earnings and expected dividends. *Journal of Finance* 43, and Ilmanen, A. (2011), Expected Returns, *Wiley Finance*.

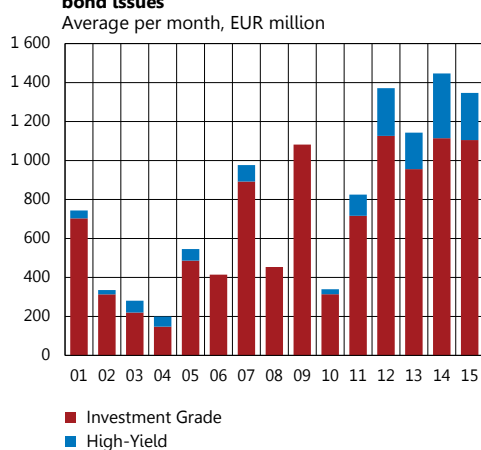
⁴⁶ Asness, C.S. (2003), Fight the Fed model: The relationship between stock market yields, bond market yields and future returns, *Journal of Portfolio Management* 30(1).

⁴⁷ In this article market value in relation to the GDP is shown instead of price in relation to earnings (P/E ratio). This is because time series on profits for Swedish companies are relatively short. If a ten-year moving average is used for this series, as in Shiller's cyclically adjusted P/E ratio (CAPE), the historical average will not be useful. For US data, market value to GDP has shown to be better on predicting future performance than the P/E ratio. See Ilmanen, A. (2011), Expected returns, *Wiley Finance*.

Chart A3:3 Risk premiums for Swedish corporate bonds

Note. The risk premium is expressed as the difference between the average interest rate from a representative sample of Swedish corporate bonds issued in SEK and the risk-free interest rate (swap rate).

Sources: Nasdaq and Bloomberg

Chart A3:4 Swedish non-financial corporations bond issues

Note. Some bonds have no credit rating from a credit institution and for these bonds the allocation between Investment Grade and High Yield is based on the banks' credit assessments of the companies.

Source: Dealogic

Difficult to assess the risks on the bond market

As monetary policy has become more and more expansionary, yields on covered bonds and corporate bonds have fallen over a longer period. However, as with the equity market, there has recently been a price correction and bond yields have risen to some extent. One way of analysing the valuation of bond market is to study the risk premium linked to different types of bond. The risk premium is the compensation required for an investor to take the risk linked to owning a bond compared with a risk-free asset.

The average risk premium for Swedish corporate bonds has decreased since 2012. Recently, however, the trend has turned and premiums are now above the average of the last ten years (see chart A3:3). It is not clear though how this should be interpreted, as the average is brought down by the very low level observed before the financial crisis. The recent upturn in risk premiums could be due to the assessment that uncertainty has increased, but also to investors being less likely to take risks. All things considered, it is difficult to make a comment about risk-taking on the Swedish corporate bond market and hence about the valuation.

Recently Swedish companies have issued an increasingly large amount of bonds (see chart A3:4). This also applies to companies with poorer credit quality⁴⁸. This could indicate a growing demand for high-risk assets among those investing in bonds, but an important explanation is probably that the Swedish bond market has gone through some changes over the same time period. Improved statistics, new market places and trustees representing investors have made it easier for Swedish companies to obtain funding on the financial markets, which has contributed to an increase in the volume of issued corporate bonds.⁴⁹

The difference between the risk-free interest rate and bond yields on the covered bonds market has been on a downward trend since 2012, even if this too has seen a slight increase more recently. As shown by chart A3:5, the turbulence on the international financial markets in 2008-2009 led to a sharp increase in covered bond yields compared with the risk-free alternative, which made it more difficult for Swedish banks to obtain funding. This scenario could be repeated if the appetite for risk were to change, with negative consequences as a result (see also Chapter 2).

On the government bond market, the term premium, or the yield risk premium on long-term bonds, is close to zero. This shows that the compensation incentive for investors to take this risk is low. This is a direct effect of the Riksbank's expansionary monetary policy, including the purchases of government bonds.⁵⁰ It is hard to say how

⁴⁸ To compensate for this risk, these companies issue bonds with a higher return, often called "high-yield" bonds.

⁴⁹ For a more detailed discussion about the increase in market funding among Swedish companies, see Bonthron F. (2014), Developments on the Swedish corporate bond market, *Economic Commentaries*, no. 7, 2014. Sveriges Riksbank.

⁵⁰ For a more detailed discussion about the effects of the Riksbank's purchase of government bonds, see De Rezende R., Kjellberg, D. and Tysklind, O. (2015), Effects of the Riksbank's government bond purchases on financial prices, *Economic Commentaries*, no. 13, 2015. Sveriges Riksbank.

the term premium will normalise going forward and what consequences it will have, as there is little experience of this situation both domestically and internationally. A rapid increase in term premiums could, however, lead to greater volatility and general unease on the financial markets.

Housing is highly valued

Prices on the Swedish housing market have risen over a long period, and have increased over the past year by 18 per cent on average. At the same time, household indebtedness is at a historically high level (see Chapter 2). A common way of analysing housing prices is to compare them with corresponding rents. However, rental market regulations in Sweden make this type of analysis less reliable, and there is a risk of overestimating the valuation of the housing market. Instead, the Riksbank has chosen, among other measures, to analyse housing prices in relation to disposable income. To ensure price developments on the housing market are sustainable, the price in relation to disposable income should not demonstrate a long-term rising trend. Seen over very long periods, this ratio has actually fallen in countries and cities with available data (including Sweden), even in attractive and densely populated areas. In Sweden's case however, this ratio has shown an upward trend over the last twenty years. Tenant-owned apartment prices in particular have risen rapidly in relation to levels of disposable income. Since 2002 alone, tenant-owned apartment prices have increased more than twice as fast as disposable income (see chart A3:6).

As well as this metric, three different empirical models have been used to make estimates. These analyse single-family house prices in different ways, based on underlying fundamental variables such as disposable income, wealth, supply on the housing market and interest rates.^{51 52} The results obtained from the models paint a somewhat scattered picture of the valuation of the Swedish housing market. The results indicate that the price developments can partly be explained by fundamental factors but also point to the fact that recent sharp price increases will decline. The results also indicate that the recent increase in housing construction has not yet had a major effect on the housing stock and hence no effect on housing prices.

The overall picture painted by the models is that the housing market is highly valued and that the growth in housing prices seen over the past few years probably will decline. A normalisation of the interest rate level would also contribute to this. However, a major fall in housing prices cannot be ruled out. Although falling housing

Chart A3:5 Difference between the yield on Swedish covered bonds and risk-free interest rate
Basis points



Note. The risk-free interest rate refers to the swap rate and the covered bonds are issued in SEK.
Source: Macrobond

Chart A3:6 Swedish housing prices in relation to disposable income
Index, 2002 = 100



Sources: Statistics Sweden, Valueguard and Mäklarstatistik

⁵¹ The econometric models used are a BVAR model, an error correction model and an equation model inspired by the field of behavioural science. These models are explained and discussed in the Economic Commentary Giordani, P., Grodecka, A., Kwan, S., Morales, P., Olcer, D. and Spector, E. (2015), Asset valuation and financial stability, *Economic Commentaries*, no. 15, 2015. Sveriges Riksbank.

⁵² The models only analyse single-family houses due to limited historical data on tenant-owned housing prices. But since single-family houses constitute a larger share of the market and tenant-owned housing prices have risen to an even greater extent than single-family house prices, the model results are to be seen as a cautious housing price estimate.

prices do not necessarily lead to direct credit losses for banks, they could, in combination with high indebtedness among Swedish households, have a significant impact on the real economy as a result of reduced private consumption.

Conclusion

The overall assessment is that particularly housing, but also equities, are highly valued in a historical perspective. Government bonds are highly valued as a direct consequence of the Riksbank's purchases of securities, while the price of corporate bonds and covered bonds has recently fallen somewhat. In a historical perspective, therefore, the valuation is harder to interpret.

A high valuation does not necessarily mean that asset prices will fall in the future. On the other hand, the highly-valued assets imply that the likelihood of a price fall is increased, which in turn implies a heightened risk to financial stability. Furthermore, all three asset classes are likely to be sensitive to interest rate increases.

Historically, sharp falls in asset prices combined with extensive private indebtedness have contributed to deep and long-term recessions. The high indebtedness among households in Sweden, combined with highly-valued asset prices, mean there is a high level of vulnerability for both households and the banking system. A fall in housing prices could therefore have significant consequences for both financial stability and the real economy.

Swedish financial institutions and low interest rates

This article analyses how Swedish banks, insurance companies and investment funds are affected by the current low interest rate level, as well as the impact this can have on financial stability in Sweden. The conclusion is that vulnerabilities in financial institutions and in the financial system have increased. If interest rates remain low for a long time, this can lead to greater risk-taking and hence to financial institutions becoming even more vulnerable to, for example, a fall in asset prices.⁵³

The recent years' low inflation and the resulting historically low interest rates can affect the financial situation for Swedish financial institutions, and make them more vulnerable to shocks. The low interest rate may also lead to institutions changing their behaviour in a way that makes them even more vulnerable to shocks. They may, for example, start investing more in riskier assets, thereby increasing their risk-taking. If the risk-taking becomes excessive, it could impact financial stability. Excessive risk-taking occurs when an institution's risks exceed its capacity to manage potential losses or other unfavourable situations. However, it is difficult to assess when risk-taking becomes excessive, for example since it can differ between individual institutions.

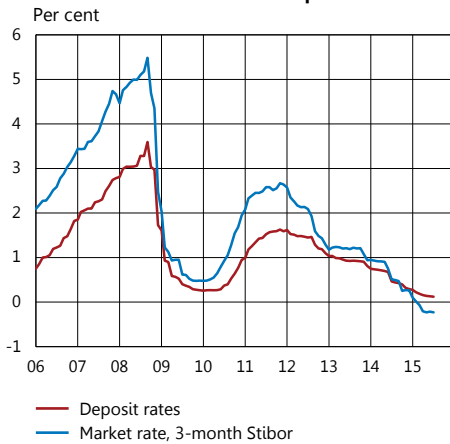
Low interest rates can affect financial institutions in different ways. The three types of financial institutions – banks, insurance companies and investment funds – are therefore analysed separately in this article. Nevertheless, the fact that the institutions are linked together means that problems for one institution can spread to the others (see Chapter 2). If one institution becomes more vulnerable, it means increased vulnerability of the whole system – in other words, systemic risk increases.

Banks' earnings are affected via different channels

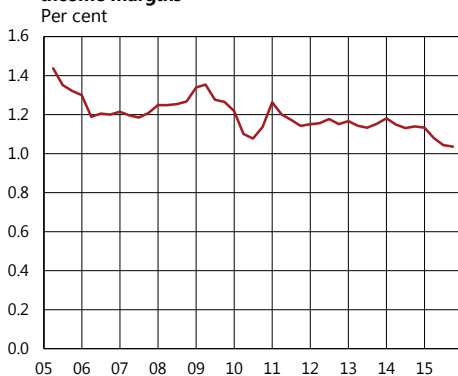
When the general interest rate level changes, it can affect banks in different ways. The overall effect on banks depends on several factors, such as the macroeconomic environment, banks' business models and the competition they face. How the major Swedish banks have so far been affected by the low interest rate level is analysed below.

Banks' lending rates usually decrease when interest rates fall, which reduces their interest income. The interest rates that banks pay to fund themselves also fall, but not always as much as lending rates. This is due to the fact that the banks obtain funding both on the market and via deposits from the customers. Interest rate costs for wholesale funding are directly affected by low interest rates. However, in a situation where deposit rates are already zero in

⁵³ This article is based upon Gibas, N., Juks, R. and Söderberg, J. (2015), Swedish financial institution and low interest rates, *Economic Commentaries*, no. 16, 2015. Sveriges Riksbank.

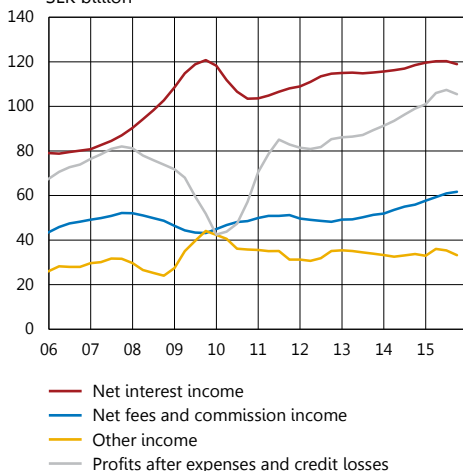
Chart A3:7 Market rates and deposit rates

Source: Statistics Sweden

Chart A3:8 The major Swedish banks' net interest income margins

Note. Net interest income margin is the relationship between net interest income and interest-bearing assets. Interest-bearing assets include lending to the public and credit institutions as well as interest-bearing securities. Balances at central banks have also been included.

Sources: Bank reports and the Riksbank

Chart A3:9 Major Swedish banks' profits

Note. Rolling four quarters. Other income includes income from market-valued financial instruments.

Sources: Bank reports and the Riksbank

principle, the banks' costs for this funding cannot fall any lower unless they introduce negative interest rates. Chart A3:7 shows that Swedish banks' aggregate deposit rates are just above zero while market rates have turned negative.

As far as the major Swedish banks are concerned, this has led to a situation where the interest income from one krona of lending has fallen more than the interest expense associated with funding one krona of lending. This is reflected by the fact that the so-called net interest income margin has declined somewhat (see chart A3:8). The fact that the net interest income margin has nevertheless not fallen to any great extent is largely due to the banks' wholesale funding costs falling at the same time.

Simultaneously, low interest rates have stimulated the demand for loans, which has above all resulted in banks' increased mortgage lending. As a result, banks' earnings from lending activities, their net interest income in monetary terms, has only decreased marginally despite somewhat lower margins (see chart A3:9).

Banks' profits have also been sustained by a rapid increase in income from other activities such as fund management and advisory services, known as fees and net interest income margin (chart A3:9). This is partially due to the fact that the low interest rate level has increased inflow to banks' investment funds, thereby boosting their management income. In addition, activity on the Swedish corporate bond market has benefited, increasing the banks' income from advisory services. Banks' credit losses have also been low, which may be partially due to the low interest rate level.

How have banks' risk-taking and vulnerability changed?

Banks, like many other institutions, always have to consider how much risk they are willing to take to obtain a certain expected profitability. A prolonged period of low interest rates could put pressure on Swedish banks' results and thereby on their profitability. In such a scenario, banks can either accept that this is happening or decide to increase their risk-taking to maintain their profitability.

Banks can increase their risk-taking by lending more to higher-risk borrowers or by introducing negative deposit rates. Negative deposit rates reduce the banks' funding costs, but they may also lead to deposit outflow or cash withdrawals. At present, however, banks have only chosen to introduce negative deposit rates on a limited amount of their deposits. Neither are there any clear signs of banks having otherwise increased their risks in relation to their capital and liquidity reserves.

So far, the low interest rates have elevated the risks for banks primarily via increased mortgage lending. A rapid growth in mortgages leads to higher concentration risks for Swedish banks as they are already highly exposed to this sector. As highlighted in the article "Asset valuations and financial stability" in this report, the housing market can be considered to be highly valued in a historical perspective, which increases the likelihood of prices falling. This, in turn, may increase the likelihood of Swedish households reducing their consumption and higher funding costs or poorer access to funding for banks. Vulnerability among Swedish banks can therefore be said to have increased recently. It is therefore important to continue monitoring changes in the banks' behaviour and to ensure that their resilience is seen in relation to the risks in the banking sector.

Swedish life insurance companies are sensitive to low interest rates due to high guaranteed returns

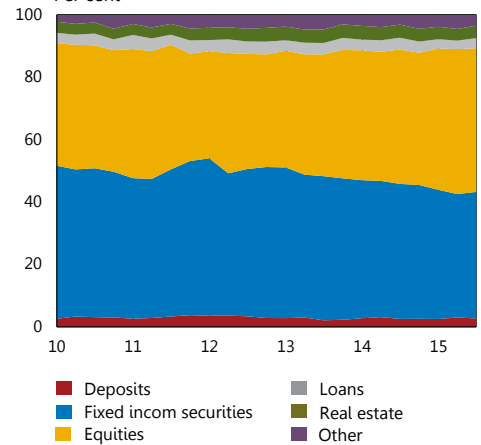
In addition to the banks, Swedish life insurance companies are also affected by low interest rates. This is mainly due to the fact that they have long-term financial obligations in the form of guaranteed returns on pension savers' capital. In order to meet these obligations, they invest in financial assets, in particular equities and bonds (see chart A3:10). If the insurance company's assets consist of bonds with the same maturity as their obligations, the company is not affected by interest rate changes. However, if the maturity of the obligation is longer than the bonds, the company must reinvest in new bonds as the previous holdings mature. If the guaranteed return is higher than the prevailing interest rate, there is a risk that companies will not be able to meet their future obligations.

The greater the difference in maturity between the companies' assets and their obligations to policyholders, the greater this risk becomes. EIOPA's stress test for insurance companies in 2014 showed that this difference in maturity is large among Swedish insurance companies compared with many other European insurance companies (see chart A3:11).⁵⁴ This means that Swedish companies can encounter greater problems than many other insurance companies when interest rates are low.

Life insurance companies' solvency ratios are lower when interest rates are low

The extent to which the imbalance in maturities will lead to problems for insurance companies hence depends on the obligations that have been promised. However, it also depends on how large the companies' assets are in relation to their debts, which mainly consist

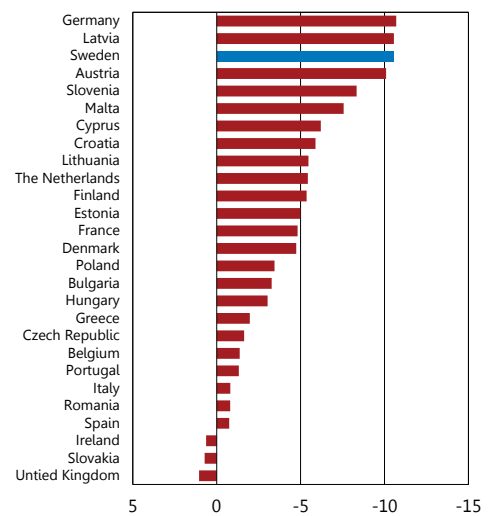
Chart A3:10 Swedish life insurance companies' assets as a proportion of total assets
Per cent



Note. "Fixed income securities" include both bonds and certificates. "Equities" also include mutual fund, except for unit linked insurance. "Real Estate" refers to buildings and land as well as stock in wholly owned property companies. "Other" refers to repos, derivatives and accrued interest income.

Source: Statistics Sweden

Chart A3:11 Difference in maturity between assets and debts for life insurance companies in the EU
Year

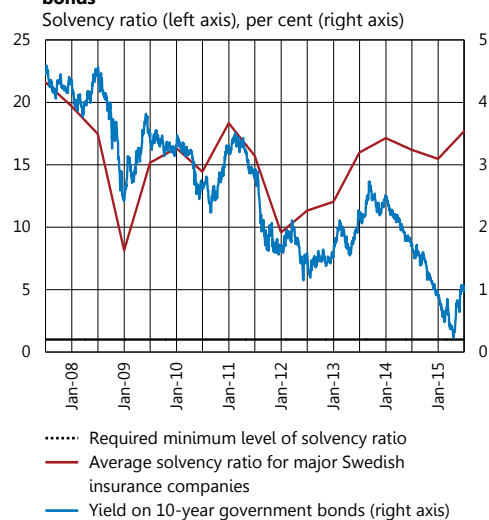


Note. Based on EIOPA's 2014 stress test of insurance companies in the EU. The figure refers to the duration of assets and debts.

Source: IMF Global Financial Stability Report, April 2015. The International Monetary Fund.

⁵⁴ EIOPA (European Insurance and Occupational Pensions Authority) is the European supervisory authority for insurance companies.

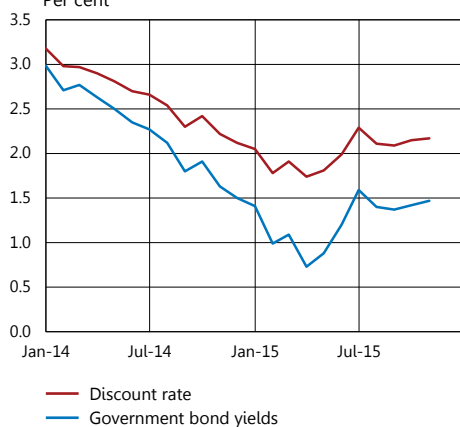
Chart A3:12 Solvency ratios of major Swedish life insurance companies and yield on government bonds



Note. The solvency ratio refers to companies who are classified as mutual life insurance companies by Finansinspektionen. Solvency ratio reported every six months for the last day of the period.

Sources: Finansinspektionen and Macrobond

Chart A3:13 Different yields in Sweden with maturities of 20 years
Per cent



Sources: Finansinspektionen and Bloomberg

of their total obligations. Insurance companies' solvency ratios relate the size of the companies' assets to their debts, and are to act as a measure of their financial strength. A low solvency ratio is a sign that the companies risk not being able to meet their obligations in the long term. The solvency ratios of the major Swedish life insurance companies are currently above one, which is the statutory minimum level (see chart A3:12).⁵⁵

A low interest rate affects solvency ratios as the discount rate used to calculate insurance companies' debts is based on market rates. When the discount rate decreases, the value of companies' debts rises and solvency ratios consequently decrease.⁵⁶ This is because a low interest rate means that companies need to have more assets today in order to be sure of meeting their obligations in the future. Since 2014, however, solvency ratios have not decreased to the same extent as interest rates. This is partially due to companies' assets having increased in value, mostly as a result of price increases on equity markets.

Another explanation for why solvency ratios have not fallen further is that FI changed the method used to calculate the discount rate in early 2014. The new discount rate is not linked to market rates to the same extent as previously (see chart A3:13).⁵⁷ For this reason, companies' debts do not increase as much when interest rates fall as under the previous discount rate design. This in turn leads to solvency ratios being higher than previously at the same interest rate level (see chart A3:12). This can lead to an overestimation of companies' financial strength and an underestimation of the risk of them not being able to meet their obligations in the long term. There is hence a risk with today's low interest rate levels that the current discount rate will lead to the protection of policyholders being undermined. It is therefore important to regularly re-evaluate the design of the discount rate.⁵⁸

Life insurance companies are vulnerable to falls in equity prices

All things being equal, low interest rates therefore mean that the value of life insurance companies' debts increases in relation to their assets, and that the solvency ratio falls. This means that their vulnerability to a fall in the value of their assets increases. In the event of a major fall in equity prices, certain companies may find it difficult to achieve the statutory minimum solvency ratio.⁵⁹ This is

⁵⁵In January 2016, the new EU directive for insurance companies, Solvency II, will take effect. The directive includes a major change to the solvency requirement. This article, however, is based on the current regulations. Swedish insurance companies' operations that are linked to occupational pensions can be exempted from Solvency II for four years. As a majority of life insurance companies' assets are linked to occupational pensions, it is relevant to use the current regulations as a basis. The discount rate will, however, be basically the same under Solvency II as it is discussed here.

⁵⁶Companies' bond holdings also increase in value when interest rates fall. Debts, on the other hand, increase considerably due to the difference in maturity as shown by Chart A3:13.

⁵⁷Chart A3:13 uses yields with maturities of 20 years. The reason for this is because the duration of Swedish life insurance companies' debts is approximately 20 years according to the EIOPA stress test.

⁵⁸The Riksbank highlighted the importance of the discount rate being regularly evaluated in its consultation response to the new discount rate, see DNR 2013-416-STA.

⁵⁹As a complement to the requirement on companies' solvency ratios, there is also the traffic light system, which is used as a supervisory tool. With the traffic light system, risks present in companies' holdings of

because around half of the companies' assets consist of equities. The fact that equity prices are highly valued historically also increases the risks of a price fall occurring (see article "Asset valuations and financial stability").

If the solvency ratio falls below the statutory level, FI can intervene and, as a last resort, either sell the company to another insurance company or close it to new policyholders (known as a "run-off"). If this kind of intervention took place at a single company, it would be unlikely to have any major impact on the financial system. However, it is possible that the company might not be able to meet its obligations and that pension payments would turn out lower than expected.

If companies' solvency ratios decline as a result of falling equity prices and begin to approach the statutory minimum level, one option could also be that they choose to sell their high-risk assets, mainly equities, and instead purchase less risky assets, mainly bonds. The reason for doing this would be to reduce the risk of an even lower solvency ratio. Since Swedish life insurance companies are among the largest investors on the Swedish equity market, they could exacerbate the fall in equity prices through this behavior. This can in turn lead to even lower solvency ratios and to companies thereby selling even more equities. A vicious circle could therefore be triggered among life insurance companies, resulting in equity prices and solvency ratios falling further.

Low interest rates can lead to life insurance companies increasing their risk-taking

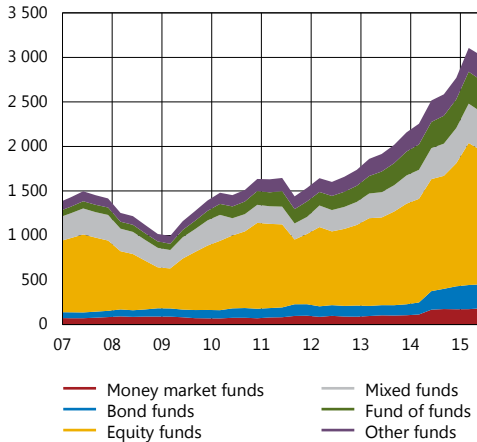
In order to compensate for the low interest rates, life insurance companies can increase their risk-taking and invest more in high-risk assets – such as equities – in the hope of increased returns. At an aggregated level, there are currently no clear signs of any increased risk-taking among Swedish life insurance companies (see chart A3:10).⁶⁰ It cannot be ruled out, however, that single companies have increased their investment in high-risk assets.

Swedish life insurance companies are already vulnerable as a result of the difference in maturity between their assets and liabilities and their large equity holdings. Increasing their risk-taking by investing more in equities will make the companies even more vulnerable to a fall in equity prices. This heightens the risk of them encountering solvency problems and being forced to sell equities. It also increases the risk of them not being able to meet their obligations and of pension payments being lower than expected.

financial assets are taken into account by testing a scenario which includes a fall in equity prices of 40 per cent. All companies currently meet the requirements of the traffic light system.

⁶⁰ The fact that the proportion of equities has risen slightly in relation to interest-bearing securities over the last twelve months in chart A3:10 is considered to be mainly due to the equity holdings rising in value rather than to increased risk-taking.

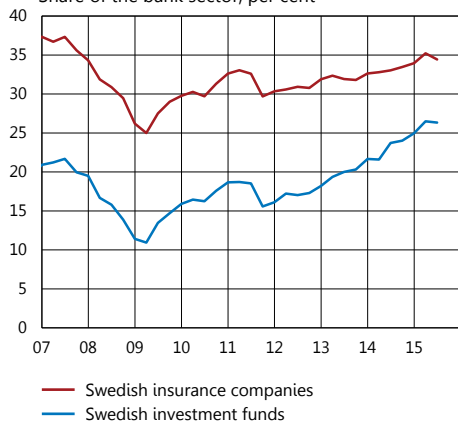
Chart A3:14 Size of Swedish funds
SEK billion



Note. Money market funds are those classified by Statistics Sweden as short-term fixed income funds, while bond funds are those classified as long-term fixed income funds.

Source: Statistics Sweden

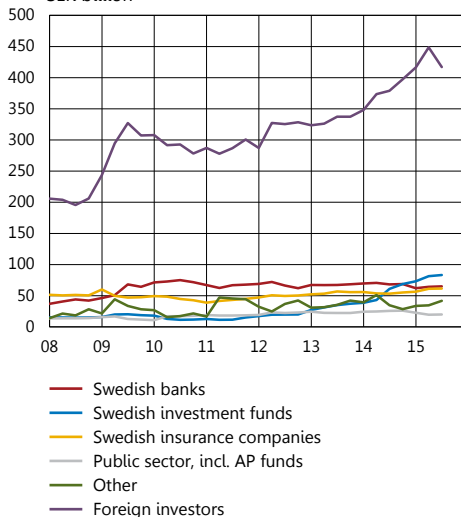
Chart A3:15 Assets in investment funds and insurance companies in relation to assets in banks
Share of the bank sector, per cent



Note. Does not include Swedish banks' foreign operations. Insurance companies also include pension funds excluding premium pensions.

Source: Statistics Sweden

Chart A3:16 Swedish corporate bond holders
SEK billion



Source: Statistics Sweden

The size of investment funds has increased when interest rates have been low

For Swedish investment funds, such as equity funds, bond funds and money market funds, the low interest rates have principally led to a substantial increase in their size over the past few years (see chart A3:14 and A3:15). This increase has been partially driven by households and companies choosing to reduce their savings in secure and low-return assets in order to invest to a greater extent in riskier assets with higher expected returns, for example higher-risk investment funds. Other factors behind the increase are first and foremost an increase in the value of funds' assets and the design of the Swedish pension system.⁶¹

In Sweden, funds that invest in Swedish and foreign equity have grown the most in recent years. Fixed income funds, that is money market funds and bond funds, have also increased in size during this period.⁶² Swedish fixed income funds own an increasing share of Swedish covered bonds (see chart 2:3) and are the largest domestic investor in Swedish corporate bonds (see chart A3:16). From a financial stability perspective, the increase in fixed income funds is therefore of greatest interest.⁶³

The expansion of fixed income funds can increase vulnerabilities

The fact that investment funds have grown can be positive for the financial system, and make it more efficient. For example, investment funds enable households to spread their savings among several financial assets. Furthermore, the growth in funds may allow companies to diversify their financing and thereby be less dependent on bank funding.

At the same time, this growth can lead to vulnerabilities in the financial system, something which has been discussed by the IMF and BIS, among others.⁶⁴ These vulnerabilities are mainly caused by savings in investment funds being relatively volatile since investors can sell their fund units at any time, even if investment funds invest in less liquid assets such as corporate bonds.⁶⁵ Investors selling their fund units causes an outflow from the investment funds. The funds must then, to the same degree, sell their holdings of financial assets, such as bonds. A large outflow from fixed income funds can therefore

⁶¹ Roughly half of the increase since 2009 is a result of an inflow to investment funds, the rest can be linked to an increased value of their assets. The fact that investment funds are growing as a result of the design of the pension system is partly due to the premium pension - for more discussion see, for example, Nilsson C., Söderberg, J., and Vredin, A. (2014), The significance of collective pension saving for the Swedish financial system, *Economic Commentaries*, no. 3, 2014. Sveriges Riksbank.

⁶² Mixed funds also invest in certificates and bonds, as well as in equities. Corporate bond funds are included in the bond fund category. Much of the increase in the size of fixed income funds in 2014 is due to funds previously registered in Luxembourg being registered in Sweden.

⁶³ From a financial stability perspective, there is no difference between directly owning equities and doing it via an equity fund. Furthermore, the equity market affects the funding of banks and companies to a lesser extent than the bond market.

⁶⁴ IMF *Global Financial Stability Report*, April 2015. International Monetary Fund. And *BIS 85th Annual Report*, 2015. Bank for International Settlements.

⁶⁵ See also Bonthron F. (2014), Developments on the Swedish corporate bond market, *Economic Commentaries*, no. 7, 2014. Sveriges Riksbank.

have consequences for banks and companies that obtain funding via certificates and bonds. The consequences of a fund outflow will probably be greater for markets and assets that are less liquid and where assets are thereby more difficult to sell, since the price of the assets typically falls more on such markets when a sales pressure builds up. The Swedish bond market, and the corporate bond market in particular, can therefore be vulnerable to an outflow from Swedish fixed income funds.

What consequences an outflow has for the Swedish bond market depends on various factors, including how large the outflow is, what proportion of the bonds are held by investment funds and how other investors act. The Swedish bond holdings of Swedish fixed income funds are, however, spread among several investment funds which are intrinsically different in terms of, for example, the type of assets they invest in. This reduces the risk of a fund outflow being of such a magnitude as to have a major impact on the Swedish bond market. There are also other participants on these markets who influence how extensive the impact will be. For example, foreign investors own more than 50 per cent of Swedish corporate bonds.

The increase in the size of Swedish fixed income funds has thereby had positive effects on the financial system while, at the same time, exacerbating its vulnerabilities. If Swedish fixed income funds were to further increase in size, the Swedish corporate bond market would be even more vulnerable to an outflow from these funds.

Vulnerabilities have increased in financial institutions

From a financial stability perspective, the main effect of the low interest rate on Swedish financial institutions has been increased vulnerability to shocks.⁶⁶ For example, banks have become more exposed to the mortgage market, which has expanded as a result of the low interest rates. Insurance companies, in turn, have become more vulnerable because, all other factors being equal, their solvency ratios are lower when interest rates are low. Furthermore, their large equity holdings and the fact that the equity market is highly valued also leads to increased vulnerability.

The vulnerabilities are to a certain extent a consequence of the business models and previous decisions of insurance companies and banks. Life insurance companies would, for example, have been less affected by low interest rates if the level of their issued guaranteed returns had been lower. Whether banks allow profitability to decrease when interest rates fall is an important factor influencing whether they change their behaviour in a way that makes them more vulnerable, for example by increasing their risk-taking.

⁶⁶ This article does not look into how the so-called shadow banking sector is affected by low interest rates, although much of this sector in Sweden is made up of the funds discussed here. For more discussion of the Swedish shadow banking sector, see Hansson D., Oscarus L. and Söderberg, J. (2014), Shadow banks from a Swedish perspective, *Economic Review 2014:3*. Sveriges Riksbank.

If interest rates remain low for a long time, it can lead to financial institutions increasing their risk-taking, thereby becoming even more vulnerable to, for example, a fall in asset prices. Both banks and insurance companies may for instance choose to invest more in risky assets to compensate for low interest rates. In addition, households and companies invest more in funds when interest rates are low, leading to a possible increase in the size of fixed income funds. This can in turn increase the vulnerability of, for example, the Swedish corporate bond market. More vulnerable financial institutions also increase the systemic risk. It is therefore important to continue to monitor financial institutions to see whether their behaviour becomes riskier if interest rates remain low.

Glossary

Basel III: International regulations for the bank's capital adequacy and liquidity. The Basel III Accord will be progressively phased in by 2019.

CET 1: Common Equity Tier 1. A definition of a bank's capital in accordance with the Basel III Accord.

Core Tier 1 capital: 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).

Core Tier 1 capital ratio: Core Tier 1 capital in relation to risk exposure amount.

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

Credit gap: The deviation from the trend in lending by monetary financial institutions to companies and households in relation to GDP.

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

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

Currency swap: An agreement to buy or sell a currency at the daily rate and then sell or buy.

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

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

ESRB, European Systemic Risk Board: The European Systemic Risk Board which is responsible for the macroprudential policy of the financial system within the EU.

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

Interest rate swap: A bilateral agreement to exchange a specific interest rate in return for another interest rate for a predetermined period according to specific conditions.

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

Key policy rate: Interest rate that a central bank sets for monetary policy purposes. In Sweden, they are the repo rate and the deposit and lending rates to the banking system. The repo rate is the Riksbank's most important policy rate.

LCR, Liquidity Coverage 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. Can also describe how quickly it is possible to convert an asset into money without the price varying to any greater extent.

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

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

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

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

Market liquidity: Market liquidity refers to the possibility to sell a financial instrument immediately or without any significant movements in the market price.

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

NSFR, Net Stable Funding Ratio or the structural liquidity ratio: Liquidity measurement defined by the Basel Committee. The measurement puts a bank's stable funding in relation to its illiquid assets in a stress scenario that covers a period of one year.

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 II and Basel III).

Solvency ratio: A measure of an insurance company's financial position calculated by dividing the company's capital base by the solvency margin. The capital base is the difference between assets and liabilities. The solvency margin is the minimum level for the size of the capital base and is calculated based on the company's size and the types of insurance it provides.

Term premium: The compensating premium an investor receives for taking on extra risk when investing in long-term interest-bearing assets.

Tier 1 capital: Equity and possibly some debt instruments, minus proposed dividends, deferred tax assets and immaterial assets (such as goodwill).

TLAC, Total Loss-Absorbing capacity: Rules for global systemically important banks to ensure that they have enough equity and eligible liabilities. The rules will be implemented in 2019 and the aim is to reduce stability risks and the risk that taxpayers will be impacted by costs during banking crises.

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