



**FINANSINSPEKTIONEN**

# The Swedish Mortgage Market 2013

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**7 MARCH 2013**



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## Summary

This report is based on Finansinspektionen's (FI's) third comprehensive survey of the mortgage market, which compiled comprehensive material from the eight largest banks in Sweden.

The survey demonstrates that the mortgage cap continues to have a positive effect. Just under 11 per cent of the households in the sample have a loan-to-value ratio exceeding 85 per cent. The trend of steadily rising loan-to-value ratios has been broken, and the households' loan-to-value ratio for new loans is still around 70 per cent.

Only one out of ten households has taken an unsecured loan, and all of these households amortise. The survey also shows that close to nine out of ten households with a loan-to-value ratio exceeding 75 per cent amortise. This means that the banks currently are applying the Swedish Bankers' Association's recommendation of amortisation for all loans with a loan-to-value ratio exceeding 75 per cent.

However, the percentage of the volume of loans that are amortised in the mortgage stock as a whole is still low. In the sample of new loans only four out of ten households with a loan-to-value ratio of less than 75 per cent (bottom loan) amortise. In addition, the average actual repayment period for bottom loans that are being amortised is very long (more than 140 years). An important task, therefore, will be to follow up on the potential long-term risks of the weak willingness to amortise loans that have a loan-to-value ratio below 75 per cent. The Council for Cooperation on Macroprudential Policy has consequently decided to appoint a joint analysis group between FI and the Riksbank. The analysis group will, for example, analyse the long-term effects of households' indebtedness.

A review of the bank's calculations of discretionary income shows that the methods the banks apply differ. FI's calculations, which are based on information about amortisation, discretionary income interest rate and housing costs that the banks said they used in their own calculations, show that many households have less discretionary income than when using the banks' calculations. FI intends to follow up on this with the banks.

Just like in the 2011 sample, FI's stress test shows that households taking on new mortgages generally have good repayment ability and resilience in terms of scenarios where there is a rise in interest rates, a loss of income or a fall in housing prices. However, individual households may still experience repayment problems.

### ■ FI'S MORTGAGE SURVEY

FI has conducted its third comprehensive survey of the mortgage market. The survey is an important part of FI's work analysing risks to financial stability and consumer protection in the financial markets. The survey consists of four sections answered by the banks: a sample of more than 18,000 new loans, a form for data on an aggregate level, qualitative questions and updated panel data from last year's sample. Based on the responses from the banks, FI analysed the current status of the mortgage market and the effects of the mortgage cap and also tested the sensitivity of the households to changes in the interest rate, a loss of income and a fall in housing prices. This year's report places particular attention on how loans are amortised and the banks' discretionary income calculations.

### ■ APPENDIX OF DIAGRAMS

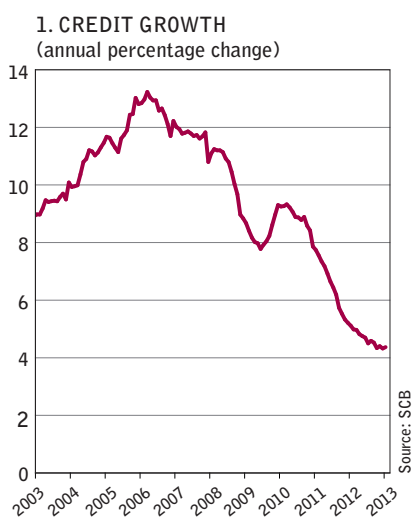
The Swedish Mortgage Market 2013 includes an appendix of diagrams that contains more diagrams than those included in the report as well as the numerical data on which the diagrams are based. This appendix can be downloaded from [www.fi.se/mortgage2013](http://www.fi.se/mortgage2013).

## Background

Finansinspektionen (FI) is conducting its third comprehensive survey of the developments on the Swedish mortgage market. The purpose of the mortgage survey is to analyse the status of the mortgage market and the risks associated with the indebtedness of households. The survey is therefore an important part of FI's work analysing risks to financial stability and promoting consumer protection in the financial markets.

Approximately two-thirds of the Swedish population live in their own house or tenant-owned housing, and housing-related loans comprise around 85 per cent of lending to households.<sup>1</sup> Between 1995 and 2007, households' indebtedness rose at approximately the same rate as housing prices. Moreover, households' loan-to-value ratios (the mortgage in relation to the market value of the home) for new loans rose during almost the entire period between 2000 and 2009. If the loan-to-value ratio is too high, borrowers become vulnerable to situations where housing prices fall at the same time as they need to sell their home. Given this background, FI decided to implement general guidelines limiting the size of loans collateralised by homes. The mortgage cap, as the general guidelines are referred to, entered into force on 1 October 2010.

The general guidelines entail that a loan collateralised by a home may not exceed 85 per cent of the market value of the home. The ultimate goal of the regulation is to ensure prudent lending practices on the mortgage market and rising loan-to-value ratios.<sup>2</sup> It is still possible to get an unsecured loan, but these are generally associated with slightly higher interest rates and stricter amortisation requirements. By limiting the possibility to borrow against the home, and since unsecured loans in general are more expensive, incentives are created for borrowers to limit their debt. Borrowers thus have a buffer in the event of a fall in housing prices. In addition, borrowers become less exposed to the effects of rising interest rates. The rate at which lending to households is increasing fell to 4.7 per cent on average in 2012, which can be compared to around 10.5 per cent on average between 2003 and 2010 (see Diagram 1).



### DESCRIPTION OF THE SURVEY

The purpose of the mortgage survey is to analyse the status of the mortgage market, evaluate the effects of the mortgage cap and assess potential risks associated with household indebtedness. This year's report places particular attention on analysing how loans are amortised and how the banks calculate the amount that the households have left to live on after paying interest rate costs, housing costs and costs for other basic necessities (discretionary income calculations). The ability of households to repay their loans is analysed by, for example, conducting stress tests and calculating discretionary income. As part of its stress tests, FI tested the sensitivity to increases in the interest rate, loss of income due to

1 Housing-related loans include loans from credit institutions to Swedish households for single-family dwellings, tenant-owned apartments and multi-dwelling buildings. In addition, some of the loans collateralised by agricultural property are also related to housing.

2 For more information, see Finansinspektionen's general guidelines (FFFS 2010:2) regarding limitations to the size of loans collateralised by homes.

unemployment and decreases in housing prices among the households included in the sample. The households with high loan-to-value ratios, above 85 per cent, are of particular interest from a consumer protection perspective.

The survey includes data from Danske Bank, Handelsbanken, Länsförsäkringar Bank, Nordea, SBAB Bank, SEB, Skandiabanken and Swedbank. Lending for housing purposes from these eight banks represent more than 95 per cent of the entire mortgage market. The information that was compiled this year consisted of the following four parts:

- Aggregate information about the mortgage stock as a whole and new loans.<sup>3</sup> The mortgage stock includes both existing loans and new loans. The variables were pre-defined by FI and the banks have totalled the underlying data themselves and reported the results of these calculations at the aggregate level. Data from this part is therefore referred to in the report as *the banks' calculations* and includes information about, for example, lending volumes, amortisation and loan-to-value ratios for the mortgage stock and new loans. FI has gathered this type of data since 2006 with figures going back to 2002.
- A survey of the total number of new loans issued at the household level (micro data) is referred to in the report as *the sample*. The sample includes all new mortgage agreements entered into during the periods 28 August - 4 September 2012 and 26 September - 3 October 2012. In total 18,178 loans are included with information about, for example, any co-signers, the number of children at home, income, the households' total loans, loans collateralised by housing, including housing-related unsecured loans, interest rates, potential amortisation and the market value of the collateral. This is the third time FI has compiled such a comprehensive sample. The previous samples were from 2009 (the year before the mortgage cap was implemented) and 2011.
- *Qualitative information*. A number of in-depth questions address topics such as information about the banks' valuation of homes, borrower assessments and views on high loan-to-value ratios and amortisation.
- *Panel data*. Contains updated information about households included in the 2011 sample. This means that the banks updated data regarding, for example, current debt, interest rates and information about amortisation for households that were included in the 2011 sample. This is the first time that FI has had access to this type of micro data and it is now possible for FI to analyse the behaviour of and changes among borrowers over time.

The report is based on the banks' calculations, the sample and the qualitative information from the banks. Unless stated otherwise in the report, references are to new loans from the sample. The stress tests that are presented are also based on the data from the sample. The report includes an appendix of diagrams. Tables 1 and 2 provide a general overview of the borrowers in the sample.

3 The definition of new mortgages in both the banks' calculations and the sample are loans taken by strict new borrowers and existing borrowers that have increased the loan-to-value ratio on the existing collateral by more than 50 per cent. New loans resulting from changing banks cannot be separated from strict new loans and therefore are included in the sample. See also the description in the glossary.

TABLE 1. Geographic distribution of the loans in the sample

	Greater Stockholm	Greater Gothenburg	Greater Malmö	Other	Total
Share of borrowers (%)	28	11	6	55	100
Share of volume of granted loans (%)	40	13	7	40	100
Average loan size (SEK)	1 490 600	1 220 400	1 148 800	754 600	1 033 600
Average market value of the home (SEK)	3 014 600	2 494 900	2 146 600	1 432 700	2 030 400
Average disposable income (SEK)	41 050	38 300	36 900	34 050	36 650

Note: The figures refer to the average per loan, which, for example, means that the average disposable income can refer to the income of more than one person. This also means that the figures in the table cannot be used to calculate loan-to-value ratios and debt ratios.

Source: FI's sample

TABLE 2. Age distribution of the loans in the sample

	< 26	26-35	36-50	51-65	> 65
Share of borrowers (%)	9	25	33	23	10
Share of volume of granted loans (%)	7	31	38	19	6
Average loan size (SEK)	787 400	1 269 700	1 191 000	829 800	620 000
Average market value of the home (SEK)	1 092 600	1 928 500	2 350 800	2 073 700	2 002 600
Average disposable income (SEK)	26 650	35 100	42 300	37 950	27 700

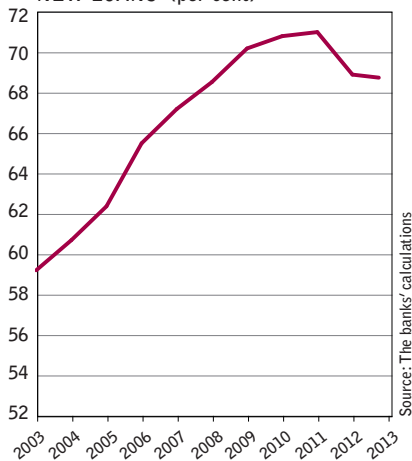
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Source: FI's sample

## Borrower analysis

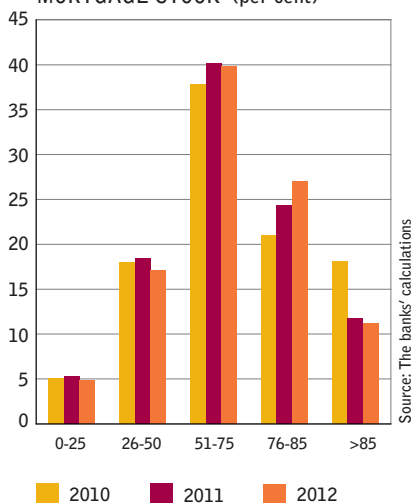
The banks are complying with the mortgage cap and the share of households with loans that have a loan-to-value ratio exceeding 85 per cent is low. As a result, the trend of steadily rising loan-to-value ratios has been broken, and the households' average loan-to-value ratio for new loans is at the same level as last year, around 70 per cent. In addition, the survey shows that a large share of households have a loan-to-value ratio of exactly 85 per cent, which indicates that the mortgage cap continues to have a normative effect. Amortisation among households with a high loan-to-value ratio has improved since the 2011 survey. Almost nine out of ten households with a loan-to-value ratio exceeding 75 per cent amortise.

2. LOAN-TO-VALUE RATIOS,  
NEW LOANS (per cent)



Note: The loan-to-value ratios are weighted by volume.

3. LOAN-TO-VALUE RATIOS,  
MORTGAGE STOCK (per cent)



Note: The loan-to-value ratios are weighted by volume.

### LOAN-TO-VALUE RATIOS

FI's mortgage survey shows that the mortgage cap is still having a positive effect and that the banks are complying with it. This can be seen in the fact that the loan-to-value ratios<sup>4</sup> for new loans are at the same level as last year, 70 per cent, in both the sample and according to the banks' calculations (see Diagram 2). This is a positive development since a loan-to-value ratio that is too high makes borrowers more vulnerable to situations where housing prices fall at the same time as the borrowers need to sell their home. Households with new loans have, on average, a 30 per cent buffer in the event of a fall in housing prices.

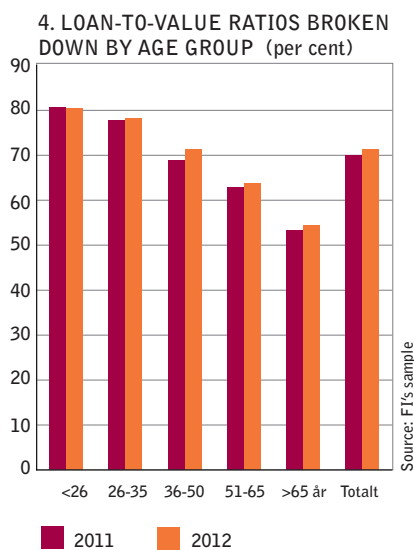
The banks' calculations show that the share of the mortgage stock that has a loan-to-value ratio exceeding 85 per cent decreased in the past two years, while the share of the mortgage stock that has a loan-to-value ratio between 76 and 85 per cent increased (see Diagram 3). Since unsecured loans are not included in the banks' calculations, this is a natural effect of the mortgage cap. The average loan-to-value ratio in the mortgage stock is around 65 per cent, which is not that far away from the average loan-to-value ratio for new loans.<sup>5</sup>

In the sample, just over 12.5 per cent of the households have a loan-to-value ratio of exactly 85 per cent. Even if this is lower than in the 2011 sample, where the share was 14 per cent, it is an indication that the mortgage cap continues to have a normative effect. In the youngest age group (<26 years old) 27 per cent have a loan-to-value ratio of exactly 85 per cent.

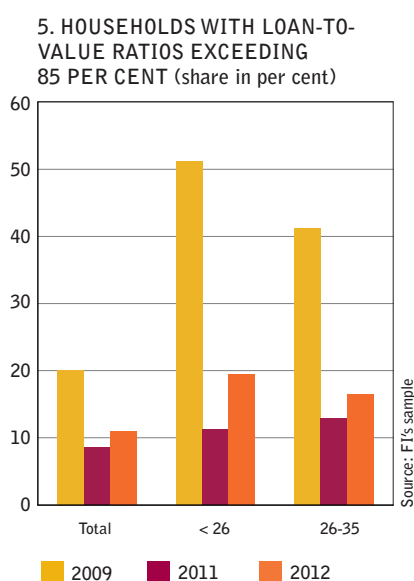
The loan-to-value ratio is relatively unchanged within the two youngest age groups when comparing the 2012 sample to the 2011 sample (see Diagram 4). However, in the three oldest age groups the loan-to-value ratio went up slightly.

4 The calculation of loan-to-value ratios differs slightly between the banks' calculations and FI's calculations from the sample. The banks calculated the loan-to-value ratio based on the loans *collateralised by homes* (bottom loan and top loan). FI also included any housing-related unsecured loans when calculating the loan-to-value ratios in the sample. For more information and a description of the calculation, please refer to the glossary.

5 The calculation of loan-to-value ratios is weighted by volume. It is calculated as a weighted average where each loan is assigned a weight based on the size (volume) of the loan. This means that the loan-to-value ratio for a large loan affects the final volume-weighted loan-to-value ratio more than a smaller loan's loan-to-value ratio does.



Note: The loan-to-value ratios are weighted by volume.



Note: Loan-to-value ratios exceeding 85 per cent in total and for the two youngest age groups.

In the 2009 sample, before the mortgage cap was implemented, 20 per cent of the households had a loan-to-value ratio exceeding 85 per cent (see Diagram 5).<sup>6</sup> In the 2012 sample 11 per cent of the households had a loan-to-value ratio exceeding 85 per cent (see Diagrams 5 and 6). Even if this is a slight increase compared to the 2011 sample, where the corresponding share was 9 per cent, the results indicate that the mortgage cap still exercises a clear restraint on households' indebtedness. In the youngest age group, 19 per cent have a loan-to-value ratio exceeding 85 per cent, which can be compared to 51 per cent before the introduction of the mortgage cap (see Diagram 5). This share also increased compared to last year's sample.

In the 2012 sample, only one out of ten households took an unsecured loan.<sup>7</sup> The survey shows that there has been a small increase in unsecured lending since 2011. Unsecured lending represents just over one per cent of total lending in the sample, compared to the 2011 sample where it represented just under one per cent. This small increase is also reflected in the banks' qualitative answers where they state that unsecured lending has become more common than in 2011. FI will follow the development of unsecured lending, but can state that there is a significantly lower percentage of new borrowers with high loan-to-value ratios today than before the mortgage cap was implemented. In the youngest age group two out of ten households have taken an unsecured loan.

A small increase in unsecured loans for housing purposes is a natural consequence of the mortgage cap, since the cap means that it is no longer possible to pledge more than 85 per cent of the home's market value. FI assumed before the mortgage cap was implemented that such an increase would occur. FI also assumed that, due to the higher cost of unsecured loans, borrowers would repay these loans as quickly as possible and thereby decrease their exposure to a downturn in the housing market.

In the 2012 sample, borrowers with an unsecured loan on average had a loan-to-value ratio of 93 per cent and the unsecured loan on average totals SEK 140,000. The average interest rate for an unsecured loan is 5.5 per cent (see Table 3), which is just over two percentage points higher than the average rate for a bottom loan. The interest rates on unsecured loans vary significantly, which to a large extent can be explained by the fact that the ability to repay varies among households. If the bank makes the assessment that the risk of the household having repayment problems is low, the household is offered a lower interest rate than if the risk was considered to be higher.

TABLE 3. Average interest rate levels in the sample (per cent)

	2011	2012
Average interest rate, bottom loan	3,6	3,2
Average interest rate, top loan	4,6	4,2
Average interest rate, unsecured loan	5,4	5,5

Note: The interest rates are weighted by volume.

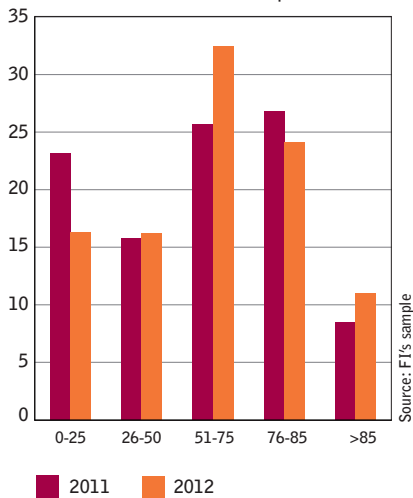
Source: FI's sample

<sup>6</sup> Before the mortgage cap was implemented it was possible to get a loan that was collateralised by more than 85 per cent of the loan-to-value ratio of the home.

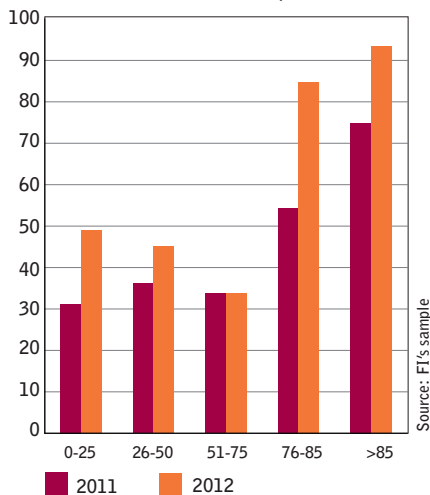
<sup>7</sup> The difference between 11 per cent with a loan-to-value ratio exceeding 85 per cent and 10 per cent that had received a housing-related unsecured loan can be explained by the fact that some households have changed banks and moved a loan that was received before the mortgage cap entered into force. These are not covered by the mortgage cap.



6. SHARE OF HOUSEHOLDS IN EACH LOAN-TO-VALUE RATIO (per cent)



7. AMORTISATION PER LOAN-TO-VALUE RATIO (share in per cent)



Note: Corresponds to the number of amortising households in each loan-to-value ratio interval as a share of the total number of households in each loan-to-value ratio interval. The sample also includes households that have changed banks and are not subject to the mortgage cap, which explains why there are households that exceed the 85 per cent loan-to-value ratio but do not amortise.

The banks state that the most common form of funding for the 15 per cent downpayment is to use savings or the surplus from a previous sale of a home. The banks also state that it is common for parents to help out, either through saved funds or by pledging their own property as collateral (the borrower then has supplemental collateral). The results from the 2012 sample show that, of the households with a loan-to-value ratio exceeding 85 per cent, approximately one out of ten in the two youngest age groups either have a co-signer outside of the household (for example, a parent) or supplemental collateral (for example, a parent's home). Only one out of the eight banks states that it has observed an increase in co-signers outside of the household, and then primarily in the major cities. Another bank states that it had already started offering its customers, before the implementation of the mortgage cap, a financing option where parents are co-signers for first-time buyers up to the age of 28. In total in the sample, however, only just over four per cent have a co-signer or supplemental collateral. Among those that have a co-signer outside of the household, 14 per cent have a loan-to-value ratio exceeding 85 per cent.

AMORTISATION SCHEDULES AND UNAMORTISED LOANS

The survey shows that amortisation behaviour has changed among Swedish households since the last survey. Of the more than 18,000 households in the sample, 57 per cent amortise at least one of their mortgages. This represents an increase compared to the 2011 sample where 43 per cent amortised. The most clear shift occurred among households with a loan-to-value ratio exceeding 75 per cent (see Diagram 7). All of the households in the survey that have taken an unsecured loan, i.e. those with a loan-to-value ratio exceeding 85 per cent, amortise.

All of the banks state in their qualitative answers that they apply the Swedish Bankers' Association's recommendation of amortisation for all loans with loan-to-value ratios exceeding 75 per cent. This is to a large extent confirmed by the analysis of the sample of new loans. Of the households with a loan-to-value ratio exceeding 75 per cent, 88 per cent amortise their mortgages (see Diagram 7). This is an improvement compared to the 2011 sample, where 59 per cent of the households with a loan-to-value ratio exceeding 75 per cent amortised their mortgages. The sample also shows an improved willingness to amortise among households with loan-to-value ratios below 50 per cent.

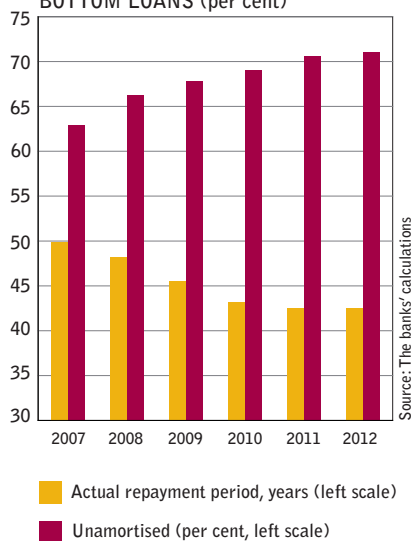
The amortisation schedule for households with high loan-to-value ratios has also decreased. The banks state that loans with a loan-to-value ratio of more than 75 per cent but less than 85 per cent must be paid down to 75 per cent within an average of 14 years. They also state that loans with a loan-to-value ratio of more than 85 per cent must be paid down to 85 per cent within an average of 10 years. This is confirmed by the analysis of both the sample and the banks' calculations, both of which show that the actual repayment period for these types of loans are around the stated levels (see Table 4).

TABLE 4. Actual repayment periods for mortgages by loan-to-value ratio (years)

	The banks' calculations	Sample
Loans up to 75%	148	140
Loans between 76% and 85%	13	12,5
Loans above 85%	8	9,5

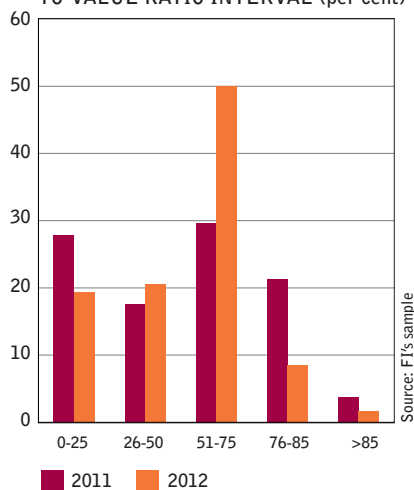
Sources: The banks' calculations and FI's sample

8. ACTUAL REPAYMENT PERIODS AND THE SHARE OF UNAMORTISED BOTTOM LOANS (per cent)



Source: The banks' calculations

9. UNAMORTISED LOANS PER LOAN-TO-VALUE RATIO INTERVAL (per cent)



Source: FI's sample

Note: Corresponds to the number of non-amortising households in each loan-to-value ratio interval as a share of the total number of non-amortising households in the sample. The sample also includes households that have changed banks and are not subject to the mortgage cap, which explains why there are households that exceed the 85 per cent loan-to-value ratio but do not amortise.

In the mortgage stock as a whole and for loans with loan-to-value ratios below 75 per cent, the positive effects are not visible in the form of improved amortisation behaviour and shorter actual repayment periods (see Table 4 and Diagram 8). The share of amortised bottom loans in the mortgage stock has decreased in recent years.<sup>8</sup> The actual repayment period for the bottom loans in the mortgage stock that are actually being amortised fell from 50 years in 2007 to 43 years in 2012, while the portion of loans that are unamortised increased during the same period from 63 to 71 per cent. If the households' unamortised loans are included and the assumption is made that borrowers amortise the same volume in SEK per year on these loans as they actually amortise on the other loans, this would represent an actual repayment period of 148 years.

The analysis of the sample of new loans shows that 40 per cent of the households with a loan-to-value ratio of less than 75 per cent amortise. This is a slightly larger percentage than in the mortgage stock as a whole. The sample shows that the households that have unamortised loans have approximately as strong a repayment ability as the sample as a whole. The sample also shows that many of the unamortised loans are in the 51–75 per cent loan-to-value interval (see Diagram 9).

The actual repayment period for the households with loan-to-value ratios of less than 75 per cent that actually amortise their mortgages is 140 years. This is in line with the total actual repayment period for the bottom loans in the mortgage stock, which is 148 years according to the banks' calculations.

The banks also answered a question about what they consider to be an acceptable loan-to-value ratio from a long-term perspective. Most of the banks say that 75 per cent of the value of the collateral is their limit. One bank says that 70 per cent is an acceptable level. The high share of unamortised loans and the long actual repayment periods are important issues that will continue to be investigated. More in-depth analysis is required to be able to see what the long-term effects of households' indebtedness are and the impact that these effects could eventually have on financial stability. This will be investigated by FI and the Riksbank's joint analysis group that was appointed by the Council for Cooperation on Macroprudential Policy.

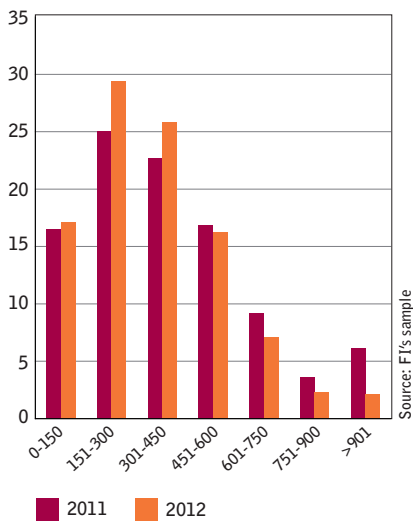
## DEBT RATIO AND INTEREST RATE RATIO

The share of households in the 2012 sample that have very high debt ratios decreased compared to the 2011 sample (see Diagram 10). In the 2012 sample, 21 per cent of the households have a debt ratio that is more than five times their disposable income. In the 2011 sample, this figure was 27 per cent. The debt ratio, calculated here as the household's total loans divided by its annual disposable income, has decreased since the mortgage cap was introduced.<sup>9</sup> The average debt ratio for households in

<sup>8</sup> In the 2012 survey FI requested time series from 2007 at an aggregate level in accordance with a new definition of actual repayment periods and unamortised loans. The banks were asked to report average (volume-weighted) actual repayment periods for the portion of the mortgage stock and new loans that are amortised. It is now possible to see what portion of the mortgage stock that is not amortised at all. This explains the major difference in actual repayment periods in this year's report compared to earlier reports.

<sup>9</sup> The regular definition of households' debt ratio corresponds to households' total liabilities (including, for example, debts in other countries) divided by their disposable income.

10. HOUSEHOLD DEBT RATIO  
(share of households, per cent)

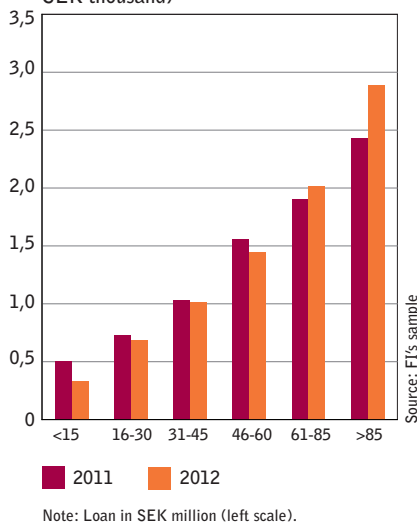


this year's sample was just over 350 per cent. Before the mortgage cap was introduced, it was around 370 per cent.

The analysis of the 2012 sample also shows, as in previous surveys conducted by both FI and other parties, that the households with the largest income have taken the largest loans (see Diagram 11). This fact combined with an improved distribution of the debt ratios, i.e. that the share of households with very high debt ratios decreased, indicates that households have an improved repayment ability.

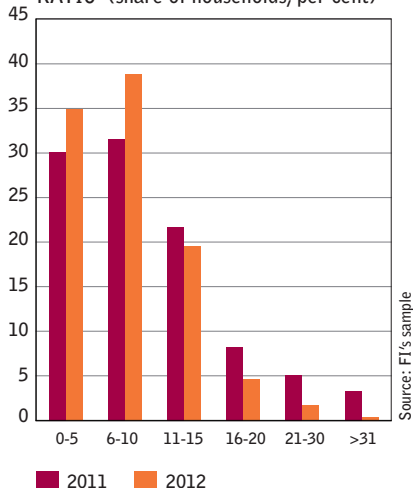
Four banks state that they use an income-based loan limit to measure the borrower's indebtedness and repayment ability. One of these banks said that it limits the loan amount to 500 per cent of the gross income, and another says that the requirements in its credit assessment, i.e. the discretionary income calculation, correspond to a loan limit of 400 per cent of gross income. The other two banks say that they check indebtedness, but make their assessments on a case-by-case basis rather than explicitly stating a limit. A fifth bank says that it will introduce a limit for this ratio in 2013. A sixth bank says that it checks that the borrower's housing costs are not too high in relation to their income.

11. AVERAGE LOAN PER INCOME GROUP (disposable income, SEK thousand)



Households' interest rate ratios, which measure how much disposable income goes to interest payments after tax, decreased in the 2012 sample compared to the 2011 sample (see Diagram 12). The average interest rate ratio is now 8 per cent, which can be compared to 10 per cent in 2011. The interest rate ratio decreased as a result of the generally low interest rate levels for mortgages during 2012. Households therefore have lower interest expenses on their mortgages, which means that they should be able to amortise these loans. This would allow households to increase their buffer against a potential fall in prices in the housing market. The lower interest rate level can also be part of the explanation behind the improved amortisation behaviour FI observed in the 2012 survey.

12. HOUSEHOLD INTEREST RATE RATIO (share of households, per cent)



## Borrowers' repayment ability

A review of the banks' calculations of discretionary income shows that their assumptions differ quite considerably. FI's calculations, which are based on the amortisation schedules, discretionary income interest rates and costs the banks say that they use, show that a larger share of households have less discretionary income than what the banks' own calculations show. This means that the banks do not appear to follow their own guidelines, which is something that FI will follow up on with the banks.

In order to assess the households' repayment ability, all of the banks use a discretionary income calculation. This calculation allows the banks to see how much of a household's disposable income is left after paying for housing costs and costs for other basic necessities. When applying for a loan, the customer provides information about income and any other debt. The bank confirms this information by performing a credit check. Taxes and costs associated with housing, i.e. interest rates, amortisation and maintenance costs, are deducted from the income (see Table 5).

The banks' calculations from the sample are presented in the section "Banks' calculation of discretionary income", which is then followed by a section where FI, based on the banks' qualitative answers, has compiled its own discretionary income calculations using the requirements on amortisation, discretionary income interest rate and housing costs provided by each bank. FI also used the Swedish Consumer Agency's estimates of subsistence costs.

TABLE 5. Banks' standardised costs when calculating discretionary income

Discretionary income interest rate (%)	7.0
Amortisation, bottom loan (years)	63
Amortisation, top loan (years)	14
Amortisation, unsecured loan (years)	10
Maintenance cost, house (SEK)	3,800
Maintenance cost, holiday home (SEK)	1,500
Maintenance cost, tenant-owned apartment (SEK)	600
Fee, tenant-owned apartment (SEK)	2,550

Note: Refers to average figures.

Source: The banks' calculations

### BANKS' CALCULATIONS OF DISCRETIONARY INCOME

It is apparent when reviewing these calculations that the banks' assumptions for calculating housing costs differ. The interest rate that the banks require households to be able to handle varies from, for example, 5.7 to 8.0 per cent.<sup>10</sup> For a mortgage of SEK 1 million, this corresponds to a difference of SEK 1,350 per month after tax. In addition, the amortisation schedules required by the banks in their calculations differ significantly. One bank does not have any requirement in its calculation that households must be able to amortise their bottom loan, while another bank

<sup>10</sup> Interest rates on mortgages vary over time and therefore banks must take into consideration higher interest rates when calculating discretionary income. The banks do this by using a so-called discretionary income interest rate that is higher than the current mortgage rates. The average discretionary income interest rate according to the banks was 7.0 per cent.

requires that households be able to amortise their bottom loan in 40 years. On average the banks' calculations require that households can amortise their bottom loan in 63 years. The banks also state that top loans must be amortised between 10 and 30 years, and unsecured loans between 5 and 12 years.<sup>11</sup>

In order to calculate a household's discretionary income, the banks use a number of standardised costs to represent the households' subsistence costs, which are then deducted from the income. The assumptions for the borrowers that are used here also differ between the banks. The banks have stated which standardised costs they would use to calculate the discretionary income for a family of two adults and two children and this cost varies from SEK 14,000 to SEK 22,000. The majority of the items that are included in the banks' calculation of subsistence costs are also included in the Swedish Consumer Agency's estimate of the costs a household has. In the banks' calculation, additional costs include, for example, car-related expenses, lunch and child care. There are also major differences here between the banks in terms of both amounts and items that are included.

A comparison between the average of the banks' calculations of subsistence costs and the Swedish Consumer Agency's calculation of subsistence costs shows that there is a relatively small difference between the two. Both banks and borrowers, however, should keep in mind that the Swedish Consumer Agency's estimate includes costs that are necessary for daily life, regardless of income, but it is not unusual for consumption patterns to vary depending on a person's income level. It is therefore important for households to understand that, even if the banks include certain expenses, this does not include precautionary savings or other consumption, such as entertainment or holiday travel.

In FI's view the banks in general take higher interest rates into consideration and make sure that households are able to amortise their mortgages. This means that the banks in general ensure that households have a satisfactory repayment ability and resilience to any adverse events. FI therefore assesses the risk of direct credit losses for the banks to be small.

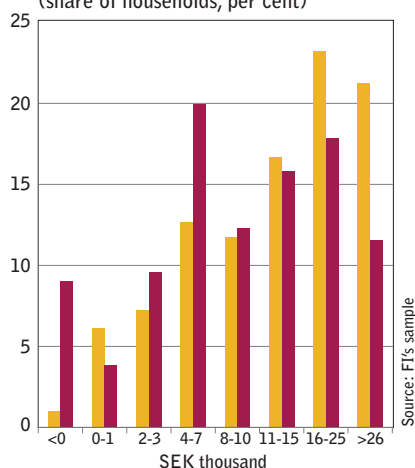
### FI'S CALCULATION OF DISCRETIONARY INCOME

FI's calculation is based on each bank's qualitative answers about its requirements on amortisation, discretionary income interest rate and housing costs. The discretionary income interest rate is applied to the households' total debt.<sup>12</sup> FI also assumed that households in the sample amortise the portion of the mortgage that has the highest loan-to-value ratio in accordance with the requirements on amortisation schedules applied by each bank. This means that if a household has unsecured loans, top loans and bottom loans, it is assumed that the household will amortise the unsecured loan first, followed by the top loan and, finally, the bottom loan (on the condition that the bank requires amortisation of the bottom loan).

11 Bottom loan usually refers to up to a 75 per cent loan-to-value ratio, top loan to a 76-85 per cent loan-to-value ratio and unsecured loan to a loan-to-value ratio exceeding 85 per cent. However, some banks do not offer top loans but rather offer bottom loans up to a loan-to-value ratio of 85 per cent and thereafter unsecured loans.

12 The households' total lending also includes, in addition to all housing-related loans, other loans the household has taken.

### 13. DISCRETIONARY INCOME (share of households, per cent)



■ Banks discretionary income  
■ FI's discretionary income

Note: The banks' data refers to the discretionary income calculations the banks provided in the sample. FI's calculation includes amortisation based on the customer's loan-to-value ratio and each bank's amortisation requirement, if one exists, as well as the bank's discretionary income, interest rate and the household's total loans.

FI based its estimate on the data from the Swedish Consumer Agency but also included an average of the banks' data on costs for a car, lunch and child care. According to this calculation, the subsistence cost for a family of two adults and two children is SEK 20,050 (see Table 6). This result is marginally higher than the average for the banks' subsistence cost, which is SEK 19,350. FI's subsistence costs also do not include anything other than necessary consumption.

TABLE 6. Subsistence costs (SEK)

1 adult	7,800
1 adult, 1 child	11,200
2 adults	14,200
2 adults, 2 children	20,050

Sources: FI's calculations and the Swedish Consumer Agency

There is a large difference between FI's discretionary income calculation and the banks' calculation in the sample (see Diagram 13). It appears that the banks do not really follow their own guidelines. FI will be further investigating this matter and following up with the banks.

According to FI's calculation, nine per cent of the households have a monthly deficit in their discretionary income, and more than one-fifth of the households have SEK 3,000 or less on which to live. This can be compared to the banks' calculation, which shows that just under one per cent has a deficit and one out of ten households has SEK 3,000 or less on which to live. The share of these households that amortise is lower than in the sample as a whole. The loan-to-value ratio among these households is also marginally higher than in the sample as a whole. The age groups "under 25" and "over 65" have the largest share of the households with SEK 3,000 or less on which to live each month.

## FINANCIAL POSITION OF TENANT-OWNER ASSOCIATIONS

In the qualitative part of the survey, FI asked the banks to answer questions about tenant-owner associations since the financial position of these associations is an aspect that banks should take into consideration when assessing the credit risk for a loan to purchase a tenant-owned apartment. Even if the members in a tenant-owner association legally are not personally responsible for paying the association's debt, the association's indebtedness affects the households' finances.

If interest rates rise, individual households are not only affected via higher interest rate costs on their own mortgage, but monthly fees may increase if the tenant-owner association does not have a buffer for higher interest rate costs. Given that the tenant-owner association is indebted, this would mean that a tenant-owned apartment owner in general can be considered to be more sensitive to changes in the interest rate.

The tenant-owner associations' liabilities total SEK 337 billion, and if these were included in the calculation of the households' debt ratio, households' debts on an aggregated level would be more than 190 per cent of disposable income, rather than around 170 per cent.<sup>13</sup>

In addition, tenant-owned apartment owners are on average more

13 When the households' debt ratio is calculated at the aggregate level, disposable income from all of the households, including those that have no debt, are included. This means that the debt ratio at the aggregate level is lower than, for example, FI's sample, where only indebted households are included.

indebted than owners of single-family dwellings. According to the banks' calculations, the loan-to-value ratio for both the mortgage stock and new loans is around four percentage points higher for tenant-owned apartment owners than for owners of single-family dwellings. The share of tenant-owned apartment owners in the mortgage stock with a loan-to-value ratio exceeding 85 per cent is also larger.<sup>14</sup> The banks' calculations also show that the amortisation schedule for new loans with a loan-to-value ratio of less than 75 per cent is 10 years longer for tenant-owned apartment owners. One probable explanation for this is that single-family dwelling owners amortise more in order to have a buffer for additional loans to complete necessary repairs. There is also a higher share of unamortised loans among tenant-owned apartment owners.

Most of the banks state that they analyse the tenant-owner association's finances and take into consideration future renovation needs. The banks also state that they analyse if there are events that could have financial consequences for the borrower, and if the borrower's repayment ability would be able to handle a higher monthly fee. Even if the households' share of the tenant-owner association's debts are not included in the mortgage cap, this is an issue that FI will be monitoring.

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<sup>14</sup> Before the mortgage cap was implemented, it was possible to take a loan for more than 85 per cent of the value of the home.

## Stress tests

FI's stress tests show that households that have been granted a new mortgage have good repayment ability and in general have good resilience in scenarios where the interest rates have risen, there is a loss of income and housing prices have fallen. However, loss of income due to unemployment would result in around four per cent of the sample having a deficit in their discretionary income. Even if the households that are affected by the loss of income will be forced to make adjustments, it is FI's assessment that financial stability currently would not be threatened by direct loan losses on mortgages, although it is not possible to eliminate the fact that this may increase the risk for loan losses in the banks' lending to non-financial companies.

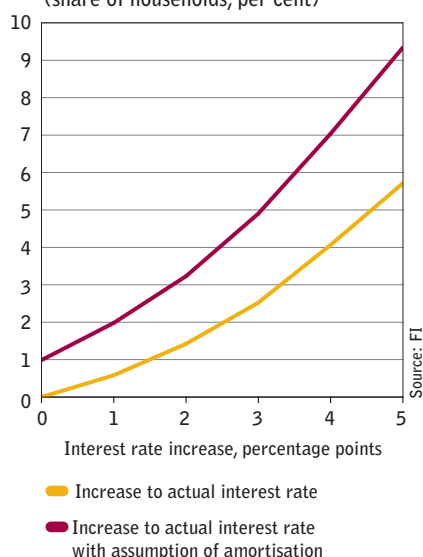
### INTEREST RATE SENSITIVITY

The interest rate sensitivity of households in the sample was tested by calculating the share of households that had a deficit in their discretionary income following various increases in the actual interest rate stated in the customer's mortgage agreement. In order to calculate how much the households have left to live on – after housing costs and subsistence costs have been paid – the same costs used in the previous section were used here (see Tables 5 and 6).

The interest rate expenses in the stress test are calculated using the household's total loans, not just the mortgage.<sup>15</sup> An increase in the borrower's actual interest rate of as much as 5 percentage points results in a deficit in just under 6 per cent of the households (see Diagram 14). The corresponding figure in the 2011 survey was marginally higher, just over six per cent. The improvement is in part due to lower interest rates in general in 2012, but also that the households in the 2012 sample have lower debt ratios and therefore are less sensitive to changes in the interest rate. If an additional assumption is made that all households amortise the part of their mortgage that has the highest loan-to-value ratio, according to the same principle FI applied in its calculations of discretionary income, it is estimated that around 9 per cent of the households in the sample will have a deficit if the interest rate increases by 5 percentage points (see Diagram 14).

Households with a higher debt ratio are naturally more sensitive to changes in the interest rate than households with a lower debt ratio. FI analysed separately the households in the sample with a higher debt ratio than 600 per cent, which was around 11 per cent. Following an increase of 5 percentage points in the actual interest rate these borrowers pay, approximately one in four had a deficit in their discretionary income.

14. HOUSEHOLDS WITH A DEFICIT FOLLOWING AN INCREASE TO THE INTEREST RATE  
(share of households, per cent)



### HOUSE PRICES AND UNEMPLOYMENT

By simulating a fall in housing prices, it is possible to get an overview of how resilient the buffers of the households in the sample are to a decrease in the prices on the housing market. A stress test shows that if prices were to fall 15 per cent, around 11 per cent of the households would have negative equity. This can be compared to around 9 per cent in the 2011 sample. The increase can be explained by the fact that a slightly larger

<sup>15</sup> If the interest rate on a mortgage rises, it is reasonable to assume that the interest rates of other loans will also rise.



share of households in the 2012 sample have a loan-to-value ratio exceeding 85 per cent than in the 2011 sample.

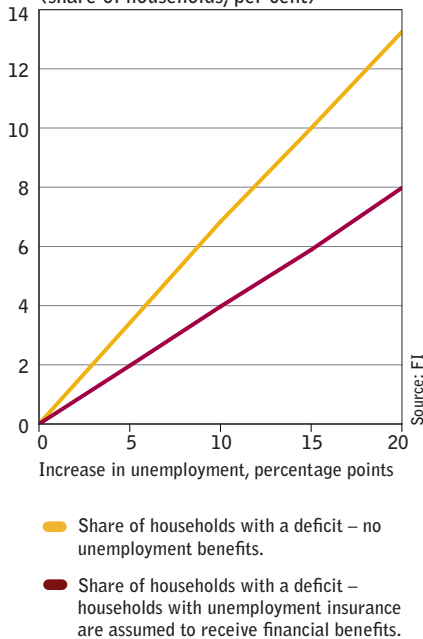
If prices were to fall 20 per cent, around one-third of the households in the sample would have negative equity, which is the same as in the 2011 sample. It is important to remember that these figures refer to new loans. According to the 2012 sample, loans with high loan-to-value ratios are being amortised more quickly than before, which means that the households' buffers against a fall in housing prices improves in the long-run.

Sensitivity to a loss of income for the households in the sample was tested by simulating an increase in unemployment. This simulation is independent of the current level of unemployment in the sample. The stress test assumes that all new mortgage holders under the age of 67 can become unemployed.<sup>16</sup> As in the stress test for the sensitivity to changes in the interest rate, the results are presented as the share of households that have a deficit in their discretionary income. If unemployment were to increase 10 percentage points, and the assumption is made that some households carry unemployment insurance and will receive financial benefits, around 4 per cent of the households in the sample have a deficit in their discretionary income (see Diagram 15). However there are always households that are affected by unemployment that for different reasons are not entitled to unemployment benefits. This would imply that the assumption about the share of households that will receive financial benefits in the event of unemployment may be a bit high. An extremely harsh assumption is that no households will receive financial benefits in the event of unemployment. Under such an assumption around 7 per cent of the households in the sample have a deficit in their discretionary income when unemployment increases by 10 percentage points.

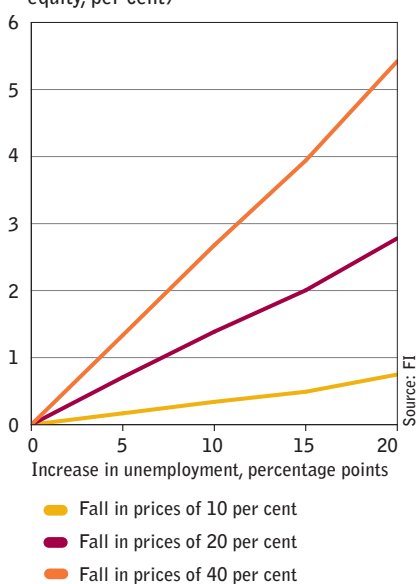
The unemployment stress test was also combined with a fall in housing prices to investigate how large a share of households in the sample would have a deficit in their discretionary income at the same time as they enter into negative equity. If housing prices were to decrease by 20 per cent and in an extreme scenario where unemployment is assumed to increase by 10 percentage points, just over 1 per cent of the households would have a deficit in their discretionary income at the same time as they enter into negative equity (see Diagram 16). This means that slightly more than one out of ten households that experience a loss of income will not be able to repay their loan at the same time as their home is worth less than the loan.

It is FI's assessment that the stability in the financial system is currently

15. HOUSEHOLDS WITH A DEFICIT FOLLOWING AN INCREASE IN UNEMPLOYMENT (share of households, per cent)



16. HOUSEHOLDS WITH A DEFICIT FOLLOWING AN INCREASE IN UNEMPLOYMENT (share of households with a deficit and negative equity, per cent)



16 Of those who can become unemployed, 66 per cent are assumed to have unemployment insurance and the rest will receive the basic amount of SEK 320/day while unemployed. An individual who carries unemployment insurance and has been unemployed for less than 201 days receives 80 per cent of his/her income and then 70 per cent for up to 300 days. Given that an individual is unemployed, we assume that there is a probability of 0.36 that this person has been unemployed for more than 200 days. An assumption is made that 40 per cent of the long-term unemployed remain unemployed for more than 300 days. As a result their period of unemployment benefits expires and they receive an income of SEK 0. If an individual's gross income exceeds SEK 18,700, the maximum compensation is SEK 680 per day for a maximum of 22 days a month. Income tax is set at 30 per cent. Finally, the assumption is made that the household's income is evenly distributed between two borrowers in the household, if there is more than one borrower.

not threatened by the risk that banks will experience major loan losses on mortgages. The reason for this is that FI's stress tests, just like in the 2011 survey, show that the households that have received a new mortgage have good resilience. Even if interest rates were to increase to significantly higher levels, the households have good repayment ability in general. Households are also showing in the 2012 sample that they have a buffer against a fall in prices on the housing market.

The direct effects from households having a deficit in their discretionary income due to loss of income and higher interest rates does not necessarily affect financial stability through loan losses in the banking sector since, for example, households may have savings to cover expenses in the short-term or the bank can give temporary relief, for example by suspending amortisation payments. In addition, as shown by the stress test that combined a fall in housing prices with a loss of income, most households have a buffer. This means that, in a worst-case scenario, households can sell their home and pay back the entire mortgage, even if this naturally would be a major set-back for households forced to take such measures.

Although the risk that the banks would experience major loan losses on their mortgages is judged to be small, it is not possible to eliminate the fact that a loss of income and a fall in housing prices could increase the risk for loan losses in the banks' lending to non-financial companies.

A loss of income and an increase in interest rates mean that households' budgets for consumption of items other than housing decreases. In the event of a fall in housing prices, it is also not possible to eliminate the fact that households' consumption will be affected negatively. A fall in housing prices could lead to households seeking to restore equilibrium in their balance sheets, i.e. returning to the original relationship between assets and liabilities. They can do this, for example, by saving and amortising their loan. In this case, the available budget for consumption would be even smaller. In the long run this could mean that there will instead be losses in the banks' lending to non-financial companies since they are dependent on the households' consumption. These indirect effects in turn could affect financial stability. The scope of these effects requires deeper analysis and FI will continue to investigate the matter in part in conjunction with the Riksbank in the joint analysis group appointed by the Council for Cooperation on Macroprudential Policy. The first report will be made at the Council meeting in October 2013.

In conclusion it should be noted that FI intends to implement a risk weight floor of 15 per cent for Swedish mortgages. One justification for this is the structural changes that have occurred on the Swedish mortgage market in the past 20 years. These changes could mean that losses on Swedish mortgages during a financial crisis might exceed historic loss levels. It is absolutely crucial for stability in the financial system that the banks have own funds that cover the risks in the Swedish mortgage portfolios.

## Glossary

**Actual repayment period** The actual repayment period is the actual number of years, based on the outstanding amount of the loan and the amount being amortised every month, that it will take to pay back the loan (bottom and top loans and, where applicable, unsecured loans) given that it is not an un-amortised loan.

**Amortisation schedule** The timeframe within which the customer must have repaid a loan. The amortisation schedule for a bottom loan is often longer than for a top loan or unsecured loan. A borrower also often has the option of not amortising a bottom loan.

**Bottom loan** The Swedish banks' definition of the part of the mortgages that have a loan-to-value ratio normally below 75 per cent. This means that the probability is high that the bank will recover the loan amount even if the home must be sold at a market value lower than the loan. Some banks currently also offer bottom loans up to loan-to-value ratios of 80 and 85 per cent.

**Credit instructions** A document for internal use at a bank that establishes guidelines for the bank's lending practices regarding amounts, maturities, amortisation and collateral.

**Debt ratio** A measure of indebtedness that is defined as the households' total debt divided by their annual disposable income. In the sample the households' total debt is measured as the sum of all of their loans.

**Discretionary income calculation** The calculation and analysis that is usually conducted by the bank when a borrower applies for a loan. It is a measurement of how much of a household's disposable income is left after accommodation and subsistence costs are paid.

**Discretionary income interest rate** A percentage used in the calculation of discretionary income to determine households' interest rate expenses. This interest rate is higher than the current interest rate to test a household's ability to withstand increases in the interest rate.

**Disposable income** A household's income after tax but before paying for all lending costs, housing costs and subsistence costs. The banks' definitions of household income can differ slightly since several of the banks only include income from employment or business and tax-free income (such as child benefits) while others also include capital income.

**Interest rate ratio** A measure of the portion of household disposable income that goes to interest rate expense. The interest rate ratio is defined as the households' actual interest expenses divided by their disposable income.

**Loan-to-value ratio** A percentage that describes the portion of the market value of a home that is leveraged. If the market value of the home decreases, the loan-to-value ratio increases, given that the loan is held constant. In the survey, the calculation of the loan-to-value ratio differs slightly between the sample and the banks' calculations. The loan-to-value ratio of the banks' calculations is calculated as the loans *collateralised by homes* (bottom and top loans). If the mortgage cap is complied with, loans collateralised by homes may not exceed 85 per cent of the market value. The sample also includes any *unsecured loans that are related to financing a home*.

**Mortgage stock** The total volume of outstanding loans collateralised by homes.

**New loan** New loans or strict new loans refer to new mortgages via either new or existing borrowers. For existing borrowers, the new loan may refer

to a loan on either new collateral or existing collateral. For the latter, the loan-to-value ratio must increase by more than 50 per cent to be included as a new loan. For new borrowers, the loan may be the result of changing banks. It is not possible to separate these loans from other loans and they are therefore included. Renegotiated loans and renewals of existing loan agreements are not included.

**Panel data** Panel data in this context is a data set that consists of a group of borrowers, the features of which have been observed during more than one time period. This data is used to analyse the behaviour of and changes in the borrowers over time.

**Refinanced loan** A mortgage with a fixed interest rate (longer than three months) for which the interest rate terms, and potentially other terms, were renegotiated at the end of the fixed interest period.

**Standardised costs** Estimated average amounts for various accommodation and subsistence costs that the bank uses in its discretionary income calculation.

**Stock of bottom loans** The total volume of outstanding loans with loan-to-value ratios that normally are below 75 per cent.

**Top loan** The Swedish banks' definition of the portion of the mortgage that exceeds the limit for the bottom loan, normally between 75 and 85 per cent of the market value of the home. The quality of the collateral for the top loan is therefore lower than that of the bottom loan. This means that the risk that the bank will not recover the top loan from a sale of the home after a decrease in housing prices is higher than for the bottom loan. Banks therefore charge a higher interest rate for the top loan.

**Total loans** Mortgages, unsecured loans for housing purposes, other unsecured loans, educational loans and other loans.

**Unsecured loans** A loan that is granted without any collateral or security. The banks often charge a higher interest rate for unsecured loans than collateralised loans such as bottom and top loans. In this survey, unsecured loans only include those loans issued at the same time as a loan that is collateralised by a home or in any other way can be related to the financing of a home.





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