



**FINANSINSPEKTIONEN**

# The Swedish Mortgage Market 2015

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**APRIL 2015**





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## Summary

Finansinspektionen (FI) monitors the mortgage market and household indebtedness closely, and the mortgage survey is an important part of that process. The survey for 2014 shows that the average loan-to-value ratio and debt-to-income ratio was unchanged between 2013 and 2014, despite rapidly increasing house prices. The average loan-to-value ratio is approximately 67 per cent and the average debt-to-income ratio is 366 per cent. The mortgage cap has dampened household indebtedness and unsecured loans have become less common since 2013. Out of the new loans in the survey, unsecured loans account for less than 1 per cent.

In recent years, loan amortisation has become increasingly common and all households with unsecured loans amortise. In 2014, 68 per cent of all households with new loans amortised them, which is a clear increase from 2011, when only 42 per cent did so. 9 out of 10 households with loan-to-value ratios above 70 per cent amortise while it is only 4 out of 10 households with loan-to-value ratios of 50–70 per cent that amortise. Since households with loan-to-value ratios above 50 per cent might react more strongly to economic shocks, FI has proposed an amortisation requirement in order to assure that these households decrease their leverage over time. FI's proposed amortisation requirement, which encompasses households with new loans and loan-to-value ratios above 50 per cent, will entail a further increase in amortisation.

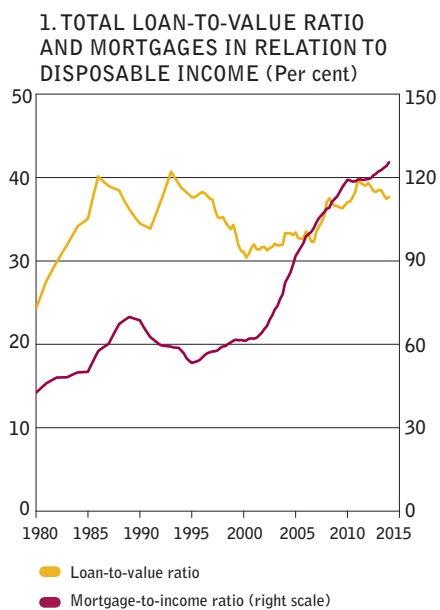
FI's stress tests show that the households generally have sound margins in their finances, both today and under worse conditions. The stress tests show household resilience towards both an increase in interest rates and towards a loss of income following unemployment. Resilience has improved considerably compared with 2013, even if the effect of lower interest rates is disregarded.

### ■ Data appendix

The Swedish Mortgage Market 2015 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/mortgage2015](http://www.fi.se/mortgage2015).

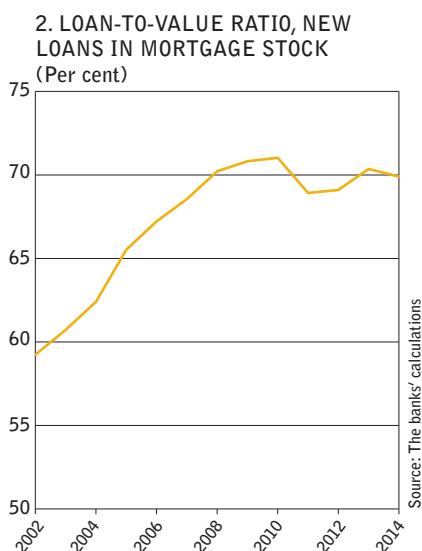
## Background

Indebtedness in the Swedish household sector can pose a risk both to individual consumers and banks, as well as to macroeconomic and financial stability. Indebtedness is therefore a crucial matter which Finansinspektionen (FI) monitors closely. The majority of household debt consists of mortgages. The mortgage survey therefore plays an important part in FI's work to analyse household borrowing behaviour and indebtedness.



Source: Statistics Sweden, the Swedish Tax Agency and FI's own calculations.

Note. The diagram refers to aggregate values for the entire Swedish household sector and is not based on data from the mortgage survey.



Note. The loan-to-value ratio refers to a volume-weighted average, i.e. it is calculated taking account of loan size, such that large loans have a greater impact on the average.

A well-functioning credit market is fundamental to the ability of households of limited wealth to purchase a home. Households incurring debt is hence a natural process, and reflects an important mechanism of a modern economy. But indebtedness also poses risks, both to households and banks, and to the economy at large. Between the beginning of the 2000s and 2010, indebtedness in the Swedish household sector rose rapidly, and the size of loans increased both in relation to home values and household incomes (diagram 1). Average loan-to-value ratios for households with new mortgages also increased rapidly in the period (diagram 2).

Since 2010, the trend of rising indebtedness and loan-to-value ratios has come to an end however, despite a boom on the housing market with a 15–20 per cent price increase. At the same time, Swedish household indebtedness is high both from a historical and international perspective.

Households run several risks linked to indebtedness. When a household borrows money to purchase a home, it assumes a cost for a long period of time ahead and thus become more vulnerable to economic shocks. The mortgage expense of households is mainly affected by the interest rate level. When interest rates rise, so does mortgage expense, which can cause problems for heavily indebted households. Households that own their home also run a risk of a decline in the value of the home, which has a negative impact on the household's wealth. Declining house prices can be particularly problematic for households with large loans in relation to the value of the home, because they risk ending up in a situation where the size of their debt is larger than the size of their assets. If the household experiences severe difficulty in repaying its loans, this can also entail a risk of banks encountering difficulties in terms of credit losses.

Besides the direct risks to households and banks, excessive indebtedness can also affect the economy at large. In the event of economic shocks, individual households can be forced to adapt to cope with repaying their debt or restoring their balance sheet. Such adaptation usually entails households cutting back on consumption. If many households make such adaptations simultaneously, this can have major negative macroeconomic effects, hence creating or aggravating a recession. In order to gain an accurate picture of these various risks, it does not suffice to look at aggregate indicators. The mortgage survey contains more detailed data and is hence an important part of FI's analysis of the risks associated with the indebtedness.

FI has gradually taken measures to mitigate the various risks posed by household indebtedness. In the autumn of 2010 FI introduced general guidelines limiting the size of loans collateralised by homes. According to the mortgage cap, as the regulation is known, new loans collateralised

by a home may not exceed 85 per cent of the market value of the home.<sup>1</sup> FI has also implemented a risk weight floor for mortgages, which ensures that the banks hold more equity that better reflects the credit risks present in their mortgage lending. In order to reduce the sensitivity that follows from high leverage, FI believes that relatively highly leveraged households ought to reduce their indebtedness over time. FI has therefore also proposed the introduction of an amortisation requirement. Such a regulation may be in place as of 1 August 2015.

## ABOUT THE SURVEY

The purpose of the mortgage survey is to describe the status of the mortgage market and analyse the risks associated with household indebtedness. The survey forms an important basis for FI's ability to assess the need for amended regulation of the mortgage market. The survey is also used to evaluate the effects of measures already taken such as the mortgage cap and as a basis for potential measures such as FI's proposed amortisation requirement. Since 2013, FI has also collected so called panel data, which enables analysing household behaviour over time, giving further insights into household behaviour. In addition to this report, the survey also provides an important basis for FI's supervision and dialogue with the banks.

This year too, FI studies the payment ability of the households included in the sample of new loans by means of monthly calculations and stress tests. As part of its stress tests, FI analysed sensitivity to interest rate hikes, loss of income due to unemployment and house price declines. This is an important element in assessing household payment ability, and hence the credit risks of banks.

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 represents more or less all lending on the Swedish mortgage market. The information that was compiled this year consisted of the following four parts:

- Information regarding existing and new loans in the mortgage stock.<sup>2</sup> The mortgage stock includes both existing loans and new loans. The variables were predefined by FI and the banks have summed up the underlying data themselves and reported the results at the aggregate level. In the report, data from this form is therefore called **the banks' calculations**. The form comprises information regarding lending volumes, amortisation and loan-to-value ratios. FI has gathered this type of data since 2006 with figures going back to 2002.
- A survey of a large number of new loans issued at the household level (micro data), referred to in the report as **the sample**. The sample includes all new mortgage agreements entered into during the peri-

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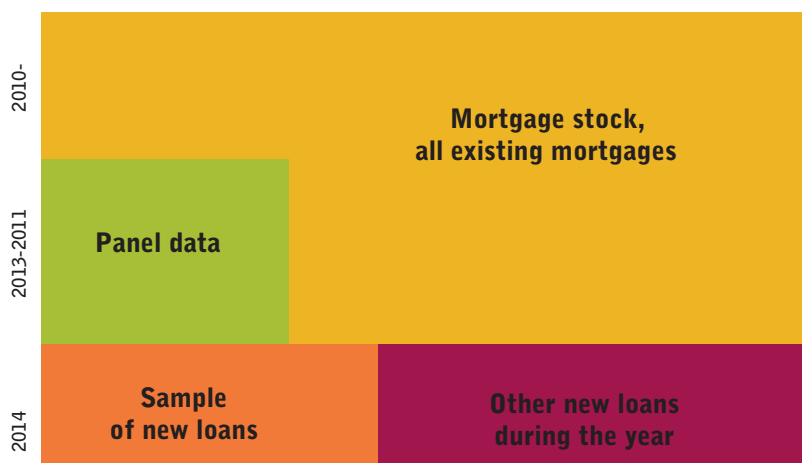
1 However, it is possible to be granted an unsecured loan to finance purchasing a home. For more information about the mortgage cap, see Finansinspektionen's general guidelines (FFFS 2010:2) regarding limitations to the size of loans collateralised by homes.

2 The definition of new mortgages in both the banks' calculations and in the sample is strictly new loans and existing loans that have been increased to such a degree that the loan-to-value ratio increased by more than 50 per cent. New loans resulting from switching banks cannot be separated from strictly new loans and are therefore included in the sample. See also the description in the glossary.

ods 27 August – 3 September 2014 and 25 September – 2 October 2014. In total 21,384 households are included after a cleaning of the data<sup>3</sup> with information about, for example, the number of children at home, disposable income, the households’ total loans, loans collateralised by the home, including home-related unsecured loans, interest rate levels, any amortisation and the market value of the collateral. This is the fifth time FI has compiled such a sample. The previous samples cover 2009, 2011, 2012 and 2013. Ahead of this year’s survey, FI conducted extensive harmonisation work to improve comparability between the years.

- **Qualitative information.** A number of in-depth questions address topics such as information about the banks’ valuation methodology for homes, assessment of the households’ economy and their view 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. In order to compensate for the diminution<sup>4</sup> that continually occurs in the panel, FI has also collected updated data for some of the households included in the 2012 and 2013 mortgage surveys. The panel enables FI to analyse the behaviour of and changes among individual households over time. More information about the panel is provided in the final chapter of the report, “Debt progression over time”.

FIGURE 1. Mortgage survey content



3 “Cleaning” of the data refers to the processing of the reported data performed by FI. In this process deficient, extreme or erroneous observations are weeded out.

4 When households repay their loans or switch banks, they disappear from the register of the original bank. There is therefore a natural diminution of the panel, which creates a need to top it up with new observations. See the chapter “Debt progression over time” for a more detailed description of how this has been managed.

Tables 1 and 2 present an overarching description of the households in the 2014 sample of new loans.

TABLE 1. Geographic distribution of loans in the sample

	Greater Stockholm	Greater Gothenburg	Greater Malmö	Other large cities	Rest of Sweden	Total
Share of households (%)	27	10	6	19	38	100
Share of volume of new loans (%)	40	11	6	17	25	100
Average debt (SEK)	2,122,100	1,716,800	1,473,600	1,255,100	974,600	1,442,600
Average market value of home (SEK)	3,430,900	2,738,800	2,191,900	1,893,700	1,453,300	2,244,500
Average disposable income (SEK/month)	45,700	42,500	40,400	38,900	36,000	40,100

TABLE 2. Age distribution of loans in the sample

	up to 25 years	25-35 years	35-50 years	50-65 years	above 65 years	Total
Share of households (%)	10	27	32	22	10	100
Share of volume of new loans (%)	7	30	38	20	6	100
Average debt (SEK)	998,700	1,624,600	1,710,100	1,269,800	897,700	1,442,600
Average market value of home (SEK)	1,283,000	2,194,200	2,579,100	2,275,100	2,171,100	2,244,500
Average disposable income (SEK/month)	29,900	38,700	45,400	42,700	30,600	40,100

## Swedish mortgage holders

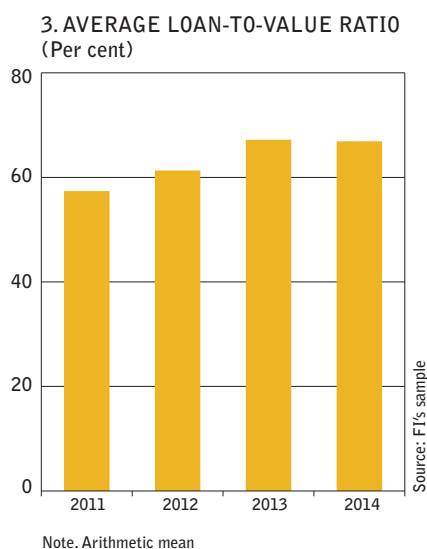
The loan-to-value ratio of households with new mortgages is unchanged since 2013, amounting to around 67 per cent on average. The share of households granted loans exceeding 85 per cent of the value of the home has declined because fewer households take out unsecured loans. The average debt-to-income ratio of households is also unchanged at 366 per cent. It has become increasingly common for households to amortise their mortgages, particularly among households with loan-to-value ratios between 70 and 85 per cent.

Household indebtedness can be measured in different ways. The debt is often placed in relation to an economic variable in order to provide a more relevant picture. A common method is to relate the debt to the value of the home that is the object of the loan, i.e. the loan-to-value ratio for the household's home. The loan-to-value ratio is an indication of the level of vulnerability of a household to changes in house prices. Partly, it is a matter of the risk of the household ending up in a situation where the size of their debt is larger than the size of their assets, but also the wish of households that have sustained a drop in house prices to restore their balance sheet. If house prices decline, affected households can be expected to reduce their consumption to increase their savings. The more heavily a household is mortgaged, the greater the scope of such adaptations tends to be.<sup>5</sup>

Another way of measuring indebtedness is by relating the total debt of a household to its disposable income – that is, income after tax and transfers. This ratio is usually called the debt-to-income ratio of the household. The debt-to-income ratio primarily gives an indication of the level of vulnerability of a household to shocks in its cash flows, i.e. income and expense. If the debt-to-income ratio is high, the household must allocate a larger portion of its income to repaying loans, giving it less scope for other expenditure or saving. Households with high debt-to-income ratios are hence more vulnerable to higher interest rate levels or loss of income than those with lower debt-to-income ratios.

### LOAN-TO-VALUE RATIOS

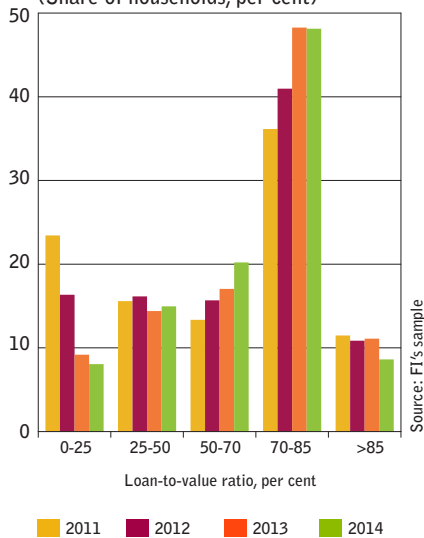
FI's sample shows that households with new mortgages had on average a loan-to-value ratio of 67 per cent in 2014, which is basically unchanged from 2013, but higher than 2011 and 2012 (diagram 3). For the entire mortgage stock, the loan-to-value ratio was around 63 per cent, which is somewhat lower than in previous years. However, this figure is volume-weighted, meaning that it is calculated by weighting by the size of the loan, and is thus not directly comparable with the average loan-to-value ratio for the sample. The volume-weighted loan-to-value ratio for the sample was just shy of 72 per cent. Because the average loan-to-value ratio better highlights the risks faced by households, the analysis will focus on this measure from now on.



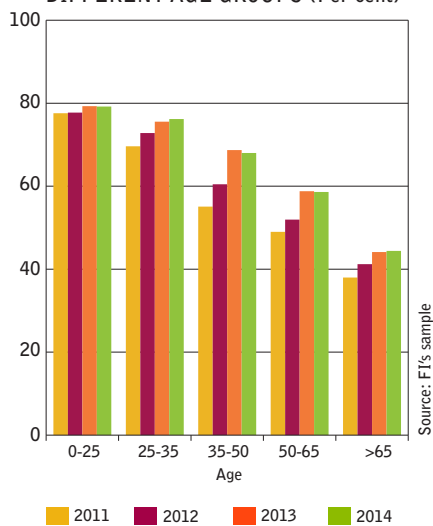
<sup>5</sup> See FI's memoranda "Stability risks associated with household indebtedness", Ref. 14-15503, <http://www.fi.se/Folder-EN/Startpage/Press/Press-releases/Listan/ccc/>, and "Proposal for new rules regarding amortisation requirements" Ref. 14-16628, for a more detailed discussion of the risks related to household indebtedness.



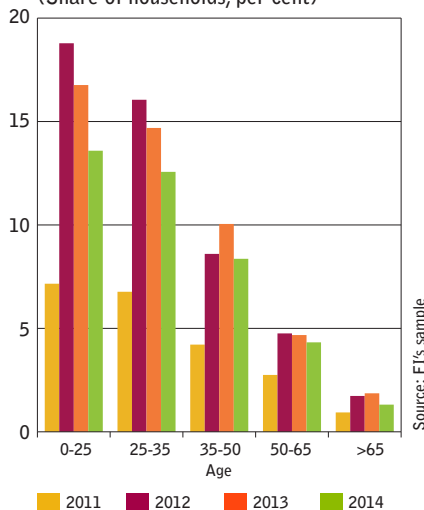
4. DISTRIBUTION OF  
LOAN-TO-VALUE RATIOS,  
(Share of households, per cent)



5. LOAN-TO-VALUE RATIOS IN  
DIFFERENT AGE GROUPS (Per cent)



6. UNSECURED LOANS  
IN DIFFERENT AGE GROUPS  
(Share of households, per cent)



Note. Share of households in each age interval that have taken an unsecured loan, per cent

More than half of the households in the sample have a loan-to-value ratio that exceeds 70 per cent (diagram 4). This is a lower share than in 2013, since the percentage with loan-to-value ratios exceeding 85 per cent has decreased.<sup>6</sup> Instead, loan-to-value ratios between 50 and 70 per cent have become increasingly common. Hence, the share of households with loan-to-value ratios above 50 per cent is basically unchanged from 2013.

Even after the introduction of the mortgage cap, it is possible to borrow to over 85 per cent of the value of the home by taking out a non-collateralised loan (known as an unsecured loan). However, it is clear that the mortgage cap has had an effect on household leverage. Fewer households take loans above the cap and almost a quarter of households in the sample have a loan-to-value ratio between 84.5 and 85.5 per cent. There are several possible reasons for this; such as more careful banks, that the cost of unsecured loans is higher or that the mortgage cap has had a normative effect.

Out of the households in the 2014 sample, around 8 per cent had taken out unsecured loans in connection with financing their home. The total volume of unsecured loans was 0.9 per cent of total new lending. This is somewhat higher than in 2013, when around 10 per cent of households were granted unsecured loans and the volume of unsecured loans accounted for around 1.1 per cent of new lending. The average size of an unsecured loan was around SEK 140,000 in 2014, which is in line with 2013. The majority of the banks included in the survey state an unsecured loan must be paid off within 10 years, which is confirmed by FI's data, in which all households with unsecured loans amortise.

As might be expected, loan-to-value ratios are higher among young households and decline with age (diagram 5).<sup>7</sup> This is probably because young households do not generally have the same possibility to use saved capital as a down payment for their home. This is also apparent by the fact that unsecured loans are more common among the younger age groups, although this has become less common since 2012 (diagram 6). Over time, loan-to-value ratios have increased the most for households between the ages of 35 and 50.

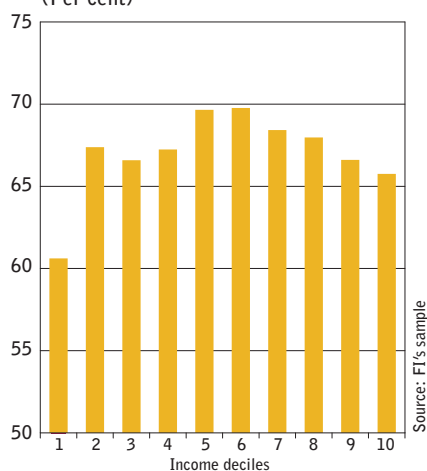
The differences in average loan-to-value ratios between various income groups are relatively small (diagram 7). Loan-to-value ratios are highest in the middle income brackets. A probable reason as to why loan-to-value ratios do not differ so much between income groups is that people with a higher income also purchase more expensive homes, and thus have about the same loan need in relation to the value of the home as do those with a lower income.

Average loan-to-value ratios are lower in Stockholm and Gothenburg than in the rest of Sweden, which has also been the case in previous years (diagram 8). Generally, however, the regional differences are small. The loan-to-value ratio decreased somewhat between 2013 and 2014 in all regions apart from the Malmö region, where it rose somewhat.

6 When FI calculates loan-to-value ratios as part of this report, unsecured loans are included. Hence, the fact that there are households with loan-to-value ratios above 85 per cent does not mean that the banks are in breach of the mortgage cap.

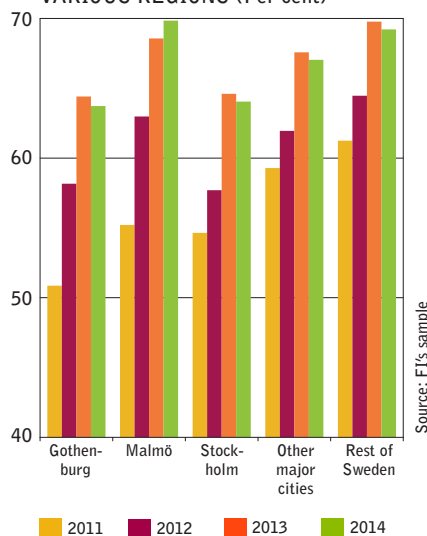
7 FI breaks down households into different age groups based on the age of the primary borrower.

### 7. LOAN-TO-VALUE RATIO IN DIFFERENT INCOME GROUPS (Per cent)



Note. The thresholds for the income deciles are  
 1: SEK 0–20,626, 2: SEK 20,626–24,473,  
 3: SEK 24,473–29,100, 4: SEK 29,100–34,342,  
 5: SEK 34,342–39,155, 6: SEK 39,155–43,576,  
 7: SEK 43,576–48,180, 8: SEK 48,180–54,167,  
 9: SEK 54,167–63,684 och 10: SEK 63,684–

### 8. LOAN-TO-VALUE RATIO IN VARIOUS REGIONS (Per cent)



## DEBT-TO-INCOME RATIOS

The average debt-to-income ratio<sup>8</sup> for household mortgages in the sample has increased since 2011, but is basically unchanged from 2013 (diagram 9). In 2014 the average total debt-to-income ratio for households with new mortgages, which also includes non-mortgages, was 366 per cent. Most households have a debt-to-income ratio of between 150–300 and 300–450 per cent (diagram 10). However, higher debt-to-income ratios are not uncommon. Over time, it is primarily the share of households with a debt-to-income ratio of between 300 and 450 per cent that has increased.

The debt-to-income ratios vary quite a lot between different income groups, although in general those with the highest income are the most indebted (diagram 11). High-income households probably have higher debt-to-income ratios due to several factors. One reason could be that such households primarily live in major city regions where house prices – and hence borrowing needs – are higher. It might also be the case that they have greater wealth and thus consider themselves to have sufficient buffers to cope with higher indebtedness.

Furthermore, the average debt-to-income ratio is highest for households between 25–35 and 35–50 years of age (diagram 12). Despite income on average being lowest among the youngest and oldest households, these households are the least indebted. Unlike the loan-to-value ratios, FI's data shows that the average debt-to-income ratios are higher in major city regions than in the rest of Sweden. It is highest in the Stockholm region, amounting to 482 per cent.

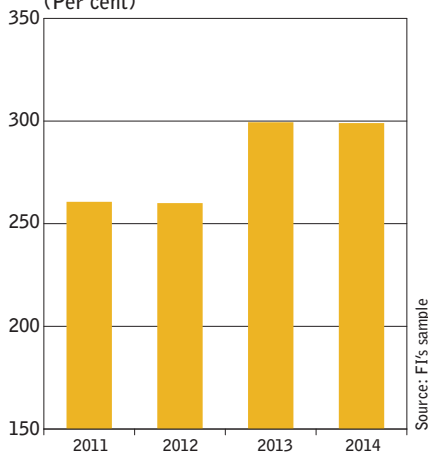
As mentioned previously, the loan-to-value ratio and debt-to-income ratio are two common measures of household indebtedness that show different dimensions of vulnerability. In order to gain a fuller picture of the risks associated with household indebtedness, it is therefore important to look at both these measures. The greatest risk is posed by households with both a high debt-to-income ratio and a high loan-to-value ratio, because they might be vulnerable both to a drop in house prices and increased expenditure or reduced income. In the sample, however, the relationship between the debt-to-income ratios and loan-to-value ratios of households is relatively weak, although households with high loan-to-value ratios generally have a somewhat higher debt-to-income ratio (see diagram B2 in appendix 2). For the most heavily mortgaged households, i.e. those with a loan-to-value ratio exceeding 85 per cent, the average debt-to-income ratio is distinctly lower than for households with a loan-to-value ratio of between 50 and 85 per cent.

## LOAN AMORTISATION

Loan amortisation enables households to reduce their debts and hence their loan-to-value ratio and debt-to-income ratio. In order to counteract the macroeconomic risks posed by relatively highly leveraged households, FI has proposed that an amortisation requirement be introduced as of 1 August 2015 (see the box Effects of FI's proposed amortisation requirement).

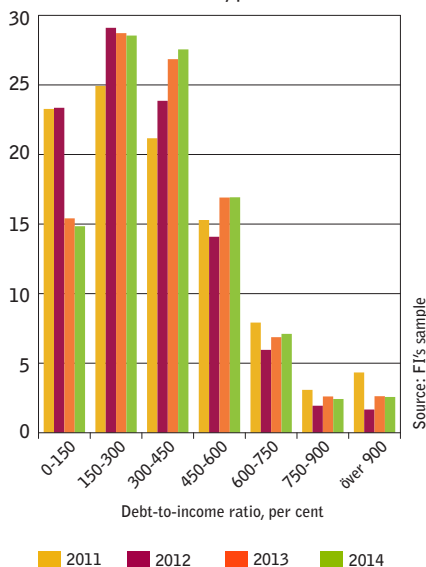
<sup>8</sup> The debt-to-income ratio of a household is calculated by dividing its total loans, including consumer credit, credit card debts, all home-related loans, etc. by its annual disposable income. The aggregate debt-to-income ratio is calculated as the sum of total household debt in relation to the sum of their income, while the average debt-to-income ratio is an average of the individual debt-to-income ratios of households.

### 9. AVERAGE DEBT-TO-INCOME RATIOS (ONLY MORTGAGES) (Per cent)



Note. The diagram shows debt-to-income ratios that are based only on households' mortgages. This is due to the fact that FI's data on households' total loans for the years 2011 and 2012 had certain flaws, while FI's data on households' mortgages for these years have a higher accuracy. Showing debt-to-income ratios based only on households' mortgages provides a better comparison over time, but result in lower levels.

### 10. DISTRIBUTION OF DEBT-TO-INCOME RATIOS (Share of households, per cent)



The share of amortising households with new mortgages has continually increased in the years during which FI has gathered data regarding the Swedish mortgage market (diagram 13).<sup>9</sup> In 2014, 68 per cent of all households with new loans amortised. This marks a clear increase from 2011, when the corresponding share was only 42 per cent. Compared with 2013, the share of amortising households has risen by around 6 percentage points, which is less than that shown by FI's mortgage survey in the autumn of 2014 (see the box FI's survey on amortisation behaviour, autumn 2014). The average amounts amortised increased from SEK 1,090 to SEK 1,350 between 2013 and 2014. A contributing factor for the increased amortisation is probably the previous tightening of the Swedish Bankers' Association's amortisation recommendation, and the Association's new recommendation on individually tailored amortisation plans introduced in July 2014.<sup>10</sup>

It is primarily the share of households with loan-to-value ratios between 70 and 85 per cent that amortise to a higher degree. There is a clear difference between households above and below a loan-to-value ratio of 70 per cent. This is probably due to the Swedish Bankers' Association former recommendation regarding amortisation for households with loan-to-value ratios above 70 per cent. Out of the households with loan-to-value ratios above 70 per cent, around 85 per cent amortised while the corresponding figure for those with loan-to-value ratios under 70 per cent is just shy of 45 per cent. Households with a loan-to-value ratio between 50 and 70 per cent are those that amortise to the least extent, while more or less all those with a loan-to-value ratio above 85 per cent do so. Households with a loan-to-value ratio above 50 per cent might react more strongly to economic shocks by cutting back on consumption, thereby creating or deteriorating an economic downturn. In order to decrease the share of relatively highly leverage households, and thereby the macroeconomic risks, FI has proposed an amortisation requirement for new loans with a loan-to-value ratio above 50 per cent.<sup>11</sup>

In the mortgage stock, around 62 per cent of households amortise, which is in line with previous years. For existing loans too, amortisation is more common among households with high loan-to-value ratios, but the differences are smaller than among households with new loans in the sample.

The amounts amortised in relation to household income have increased noticeably over time in the sample (diagram 15). In 2014 amortisation was 3.5 per cent of income, which can be compared with 3.1 per cent in 2013 and 2 per cent in 2011. It is primarily households with loan-to-value ratios above 70 per cent that have increased their amortisation.

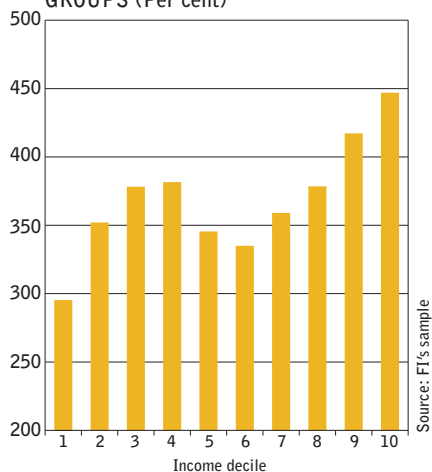
In the sample, it is more common for households with low debt-to-income ratios to amortise, but average amortisation in relation to income is higher for heavily indebted households (diagram 15). The highest level

<sup>9</sup> In the mortgage survey, FI has information about how much households plan to amortise each month at the time when the loan was being issued. However, it is not possible to ensure that this actually happens based on the sample data. Lump-sum payments, i.e. amortisation in excess of the set plan, are not captured by FI's data either.

<sup>10</sup> Since the sample was collected, the Bankers' Association has withdrawn its amortisation recommendation. However, the recommendation regarding individually tailored amortisation plans remains in place.

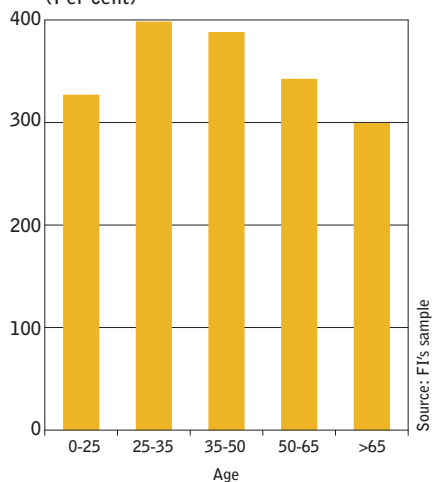
<sup>11</sup> See Finansinspektionen's consultation memorandum "Proposal for new rules regarding mortgage amortisation requirements", Ref. 14-16628.

### 11. AVERAGE DEBT-TO-INCOME RATIO IN DIFFERENT INCOME GROUPS (Per cent)

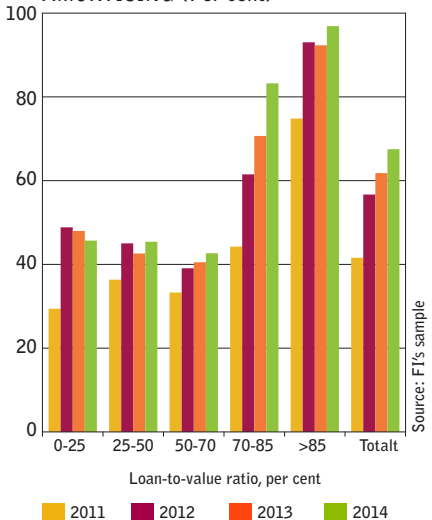


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**7:** SEK 43,576–48,180, **8:** SEK 48,180–54,167,  
**9:** SEK 54,167–63,684 och **10:** SEK 63,684–

### 12. AVERAGE DEBT-TO-INCOME RATIO IN DIFFERENT AGE GROUPS (Per cent)



### 13. SHARE OF HOUSEHOLDS AMORTISING (Per cent)



is found among households with a debt-to-income ratio between 450 and 750 per cent, where households generally allocate around 4 per cent of their income to amortisation. It is also for these households that amortisation has increased the most since 2011.

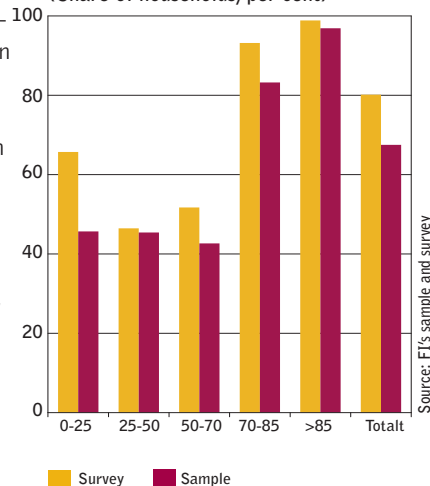
Younger households amortise to a greater extent than older households (diagram 16). This is probably mainly because they also have higher loan-to-value ratios. However, amortisation has increased to more or less the same extent in all age groups. The regional differences in amortisation behaviour are generally small, although amortisation is slightly less common in the major city regions than in the rest of Sweden.

### FI's survey on amortisation behaviour, autumn 2014

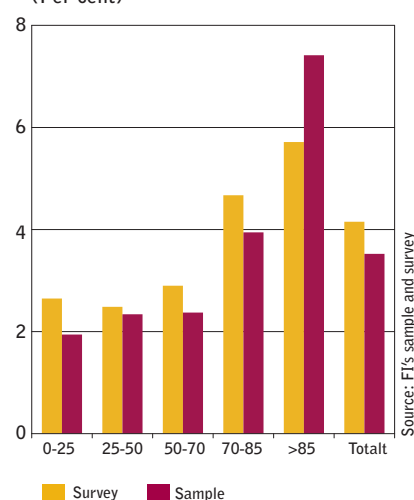
In the autumn of 2014 FI conducted a smaller survey to gain a snapshot of how household amortisation behaviour has changed as a result of the introduction of the recommendation of the Swedish Bankers' Association on individually tailored amortisation plans.<sup>12</sup> The survey contained a limited selection of the variables included in the mortgage survey sample, and encompassed around 750 households with new mortgages that had been offered an amortisation plan. The survey was thus specifically directed at households offered amortisation plans, and hence not all households with new loans. In an analysis memorandum<sup>13</sup> the results of the survey were compared with FI's sample data for 2013. The conclusion of the analysis was that amortisation increased substantially between 2013 and 2014, even when controlling for differences in other explanatory factors between the years. The main reason for the increased amortisation was that more households amortised, although the average amount amortised increased too.

If the outcome of FI's sample for 2014 is compared with the survey, it emerges that amortisa-

#### R1. AMORTISING HOUSEHOLDS FOR DIFFERENT LOAN-TO-VALUE RATIOS IN 2014, SURVEY AND SAMPLE (Share of households, per cent)



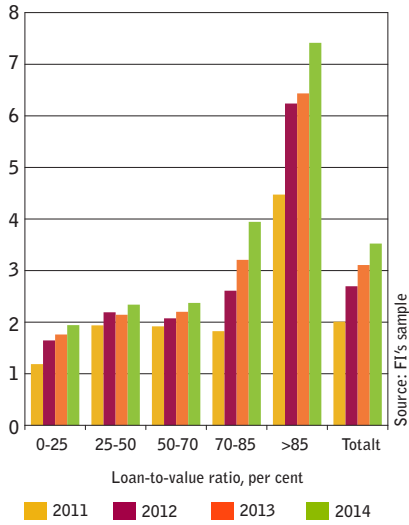
#### R2. AMORTISATION AS A SHARE OF INCOME 2014, SURVEY AND SAMPLE (Per cent)



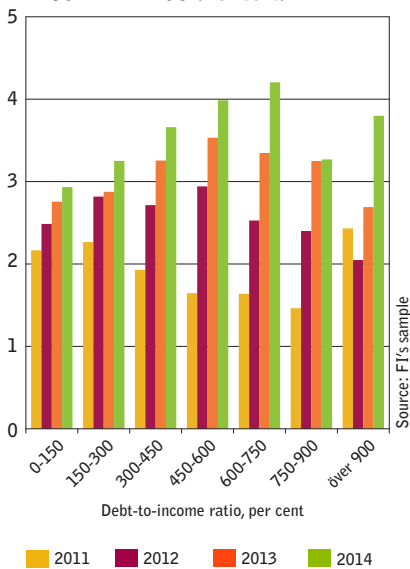
12 See the Swedish Bankers' Association's "Recommendation on individually tailored amortisation plans for mortgages", March 2014.

13 See Finansinspektionen's memorandum "Amortisations by households have increased since the introduction of individually tailored amortisation plans", FI ref. 14-15503, <http://www.fi.se/Folder-EN/Startpage/Press/Press-releases/Listan/ccc/>.

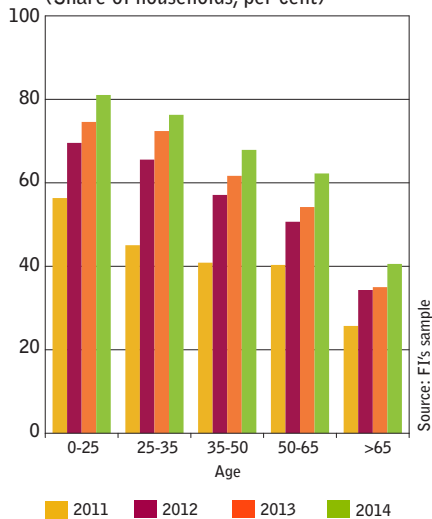
14. AMORTISATION AS A SHARE OF INCOME FOR DIFFERENT LOAN-TO-VALUE RATIOS (Per cent)



15. AMORTISATION AS A SHARE OF INCOME FOR DIFFERENT DEBT-TO-INCOME RATIOS (Per cent)



16. AMORTISING HOUSEHOLDS FOR VARIOUS AGE GROUPS (Share of households, per cent)

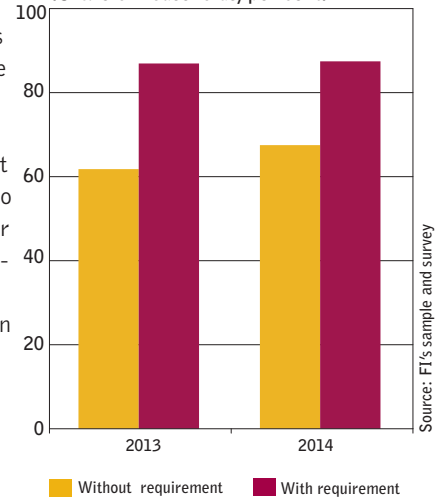


tion in the sample has not increased to the extent indicated by the survey (diagram R1). The results of the survey showed that amortisation increased on average by SEK 547 per month compared with 2013 when controlling for differences in explanatory factors. In an equivalent analysis based on the 2014 sample, the increase is SEK 220 per month. It is not possible to establish exactly what the differences in the results are due to, although one factor could be that the selection in the survey only comprised households offered an individually tailored amortisation plan, which need not be the case for all households in the sample.

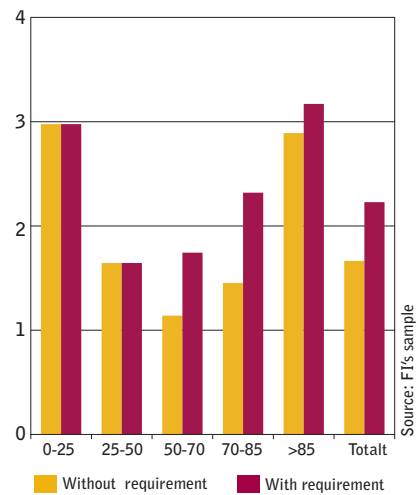
### Effects of FI's proposed amortisation requirement

In November 2014 FI announced its intention to introduce an amortisation requirement, and in March 2015 the proposal was presented in detail.<sup>14</sup> In brief, the proposal entails that new mortgages shall be amortised by 2 per cent of the total loan amount annually if the loan-to-value ratio exceeds 70 per cent, and by 1 per cent of the total loan amount annually if the loan-to-value ratio is between 50 and 70 per cent. In FI's consultation memorandum, the effects of the amortisation requirement are analysed based on the 2013 sample. FI has now performed a similar analysis using the 2014 data. An overview of the effects of the requirement is shown in diagrams R3 and R4 below. On the whole, amortisation increased between 2013 and 2014. Hence, the effects of the amortisation requirement will be somewhat lower in the comparison with 2014 instead of 2013, both in terms of the percentage of amortising households, and the average size of amortisation in relation to household income. A more detailed analysis of the effects of the amortisation requirement based on the 2014 data will be presented in the forthcoming decision memorandum.

**R3. SHARE OF AMORTISING HOUSEHOLDS**  
(Share of households, per cent)



**R4. AMORTISATION AS A SHARE OF THE LOAN SIZE IN DIFFERENT LOAN-TO-VALUE INTERVALS 2014**  
(Per cent)



Note. Loan-to-value ratios below 50 per cent are not affected by the amortisation requirement.

14 See Finansinspektionen's consultation memorandum "Proposal for new rules regarding mortgage amortisation requirements", Ref. 14-16628.

## Households' payment ability

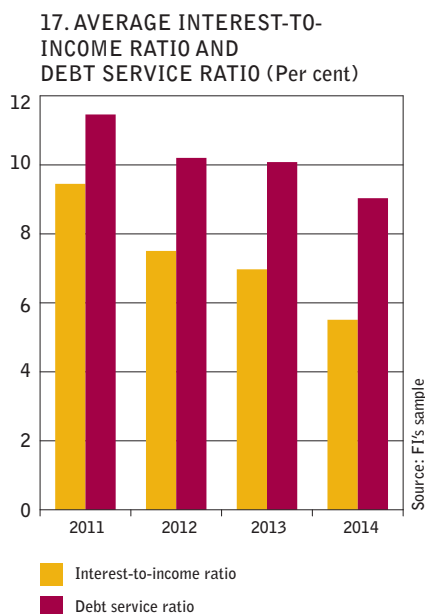
Both the banks and FI perform calculations to assess the payment ability of households. FI's review and stress tests show that households' payment ability and resilience have improved in the past few years. On the whole, FI judges that the risk of extensive credit losses is small.

A customary method of measuring household debt is to look at their interest-to-income ratio or debt service ratio. These ratios show how much of a household's disposable income is spent on its mortgage payments, i.e. interest payments and loan amortisation. The interest-to-income ratio only pertains to interest payments, while the debt service ratio also includes amortisation. The average interest-to-income ratio and debt service ratio have dropped in the last few years (diagram 17). Hence, households have on average more of their income remaining once their mortgage expenses are paid. Although these ratios are sometimes used to assess the payment ability of a household, they constitute a relatively blunt instrument of measurement. Therefore, the banks use more detailed calculations to get a picture of the financial situation of households.

### THE BANKS' ASSESSMENT OF THE HOUSEHOLDS' PAYMENT ABILITY

In order for the banks to determine which risks are associated with a mortgage, they must assess the household's payment ability. Because such assessments are a key element of the banks' risk management, FI carefully monitors the banks' methods (see the box FI's supervision of the banks' discretionary income calculations). In order to assess households' payment ability, the banks use discretionary income calculations at the time of the loan application. The calculation is an estimate of how much the household has remaining of its disposable monthly income when interest expense and other housing and subsistence costs have been paid. The banks use these calculations as the basis for the assessment of how much a household may borrow. When a household applies for a loan, it provides information about income and any other debts, which the bank then verifies using a credit information report. Taxes and housing-related expenses – such as operating costs, interest expense and amortisation payments – are then deducted from income. A standardised amount for subsistence costs such as food, telephony and insurance is also deducted in most cases. Because interest expense depends on the general interest rate level and can thus change, the banks use what are known as imputed rates of interest, which are much higher than the interest rate that the household will actually have to pay when the loan is granted. In this way, the banks ensure that households can cope with hiked interest rates. The average imputed rate of interest for 2014 was around 6.5 per cent, which can be compared with the average mortgage rate in the sample of 2.2 per cent.

The banks' methods and standardised costs at the basis of the calculations vary. Compared with 2013, most banks have however either left their standardised costs unchanged, or only made slight changes. In 2014 the average subsistence cost per month was SEK 8,100 for one adult and SEK 20,150 for two adults and two children. These figures



Note. Shows interest service and total debt service as a share of household disposable income. The payments are based on the interest rate and amortisation amounts established when the loan was granted.

can be compared with the subsistence cost benchmarks<sup>15</sup> of the Swedish Consumer Agency of SEK 5,600 and SEK 15,400, respectively.

The banks state that they are restrictive in granting exemptions from the minimum level in their discretionary income calculations, but that exceptions are sometimes made when a borrower assumes a loan due to death, or if the household has other substantial assets or a low loan-to-value ratio. This is confirmed to a certain extent by the sample, which shows that households with a deficit in the banks' own discretionary income calculations have a lower loan-to-value ratio than other households on average. In the 2014 sample, around 1 per cent of households in the sample have a deficit in the banks' discretionary income calculations. This is clearly lower than the previous year, when around 4 per cent of households showed a deficit in the banks' calculations.

#### **FI's supervision of the banks' discretionary income calculations**

In connection with this year's mortgage survey, FI has also included a review of a selection of the banks' credits.<sup>16</sup> Such a major review was conducted in 2014 as part of the European Banking Authority's (EBA's) stress tests and asset quality review,<sup>17</sup> and encompassed the four largest banks where Sweden was concerned. In the somewhat smaller review now performed by FI as part of the mortgage survey, FI reviewed credits among the other four banks included in the mortgage survey. Based on these two reviews, FI is of the opinion that there is no reason to question the aggregate credit quality of the eight banks included. At the same time, FI has, in individual cases, held certain views on how the banks perform their discretionary income calculations. This is something that FI will raise with the banks individually as part of the supervisory dialogue regularly held by FI with the banks.

#### **WHAT ARE THE MARGINS OF THE HOUSEHOLDS?**

In order to study the margins of households in the sample, FI performs its own calculations of the monthly surplus of households after necessary costs have been paid.<sup>18</sup> In order to assess current margins of households, FI uses the interest rate that applies at the time of granting the loan, and not a higher imputed rate of interest, as the banks do. Hence, FI's calculations cannot be compared directly with those of the banks. Households' resilience to rising interest rates is instead analysed as part of the stress tests performed by FI (see the section "Stress tests"). In some cases, it is interesting to look at the effect of

15 The Swedish Consumer Agency states that its calculations are based on a fundamental need for goods and services required to cope with daily life in modern society, irrespective of the household's income. It is not a case of either a subsistence level or excessive consumption, but a reasonable standard of consumption. For more information, see the report 2013:4 of the Swedish Consumer Agency: "The Swedish Consumer Agency's calculations of benchmarks"

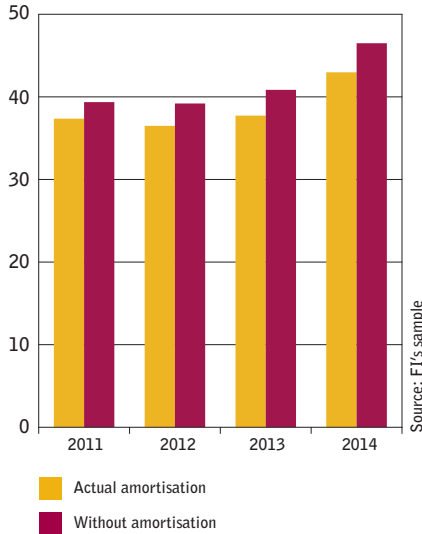
16 In the mortgage survey, FI reviewed 50 credits per bank. The reviewed credits were selected based on criteria such as the largest loans, loans in municipalities with negative population growth and loans with a weak risk grade.

17 See FI's memorandum "EBA's stress test and asset quality review (AQR)", 26 October 2014, <http://www.fi.se/Folder-EN/Startpage/Supervision/Miscellaneous/Listan/Swedish-banks-pass-the-European-stress-test/>.

18 See Appendix 1 for a more detailed description of FI's monthly calculation.

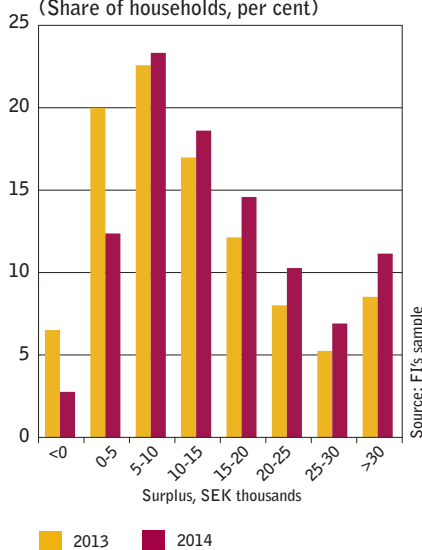


18. AVERAGE MONTHLY SURPLUS AS A SHARE OF DISPOSABLE INCOME (Per cent)



Note. Actual amortisation is according to what was established when the loan was granted.

19. HOUSEHOLDS' MONTHLY SURPLUS AT AN INTEREST RATE OF 7 PER CENT (Share of households, per cent)



Note. Refers to surplus without amortisation.

amortisation. In these cases, FI performs calculations both without amortisation and with the actual amortisation agreed upon when the loan was granted.

The calculations follow the same structure as the banks' discretionary income calculations, but differ in certain aspects. In order to estimate the housing and subsistence costs of households, standardised costs are used based on an average of the standards that banks state they sometimes use.<sup>19</sup> The standardised costs depend on the household's type of home and its size and composition, and do not refer to the expenditure level of households when the loan is granted, but rather the costs deemed necessary and thus which cannot be avoided in the event of the household falling into financial difficulty.

The margins of households are currently sound in general. According to FI's calculations, households in the sample have on average a surplus of SEK 20,300 per month after housing and other subsistence costs are paid.<sup>20</sup> This entails an average surplus of 44 per cent of disposable income compared with 38 per cent the prior year (diagram 18).

One cause of the increase in the surplus of households is that the interest rates they pay are on average 0.5 percentage points lower than 2013. However, there are clearly fewer households with small margins even at a given interest rate level (diagram 19). Hence, the increased surplus of households between 2013 and 2014 also depends on factors other than lower interest rates.

As expected, household margins increase with income. The 10 per cent of households with the lowest disposable income have on average a surplus of just over SEK 4,000 per month, while the 10 per cent with the highest income have on average SEK 55,000 (diagram 20).<sup>21</sup> Looking at all households, just over 8 per cent had a monthly surplus of less than SEK 5,000, which can be compared with 14 per cent in the 2013 sample. The share of households with a deficit at the time of granting the loan decreased from 3 per cent 2013 to 1 per cent 2014.

The proposed amortisation requirement has no considerable impact on household surplus. On average, the surplus as a share of income decreases by 5 percentage points with the proposed amortisation requirement compared with the surpluses with actual amortisation. The households that earn the least would on average have just over SEK 200 less of a surplus each month, and the households with the highest income would have SEK 2,000 less on average.

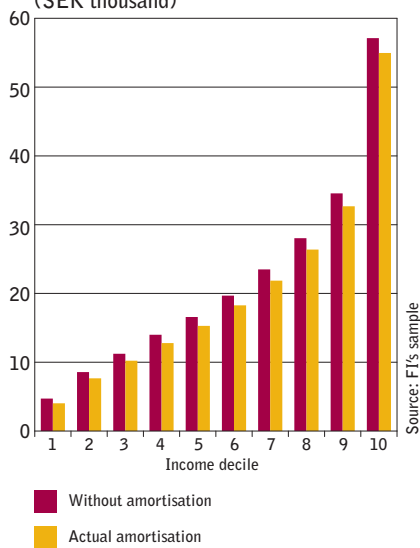
As in previous years, the youngest (under 26 years old) and oldest (over

19 The banks have access to more detailed information about households, and may therefore use household-specific information such as actual tenant-owned apartment charges and operating expenses for single-family dwellings that are based on the size of the home of the household. Because FI does not have access to sufficiently detailed information about the homes of the households, standardised costs are used instead. Hence, FI's calculations are not as precise for individual households as the banks' calculations. Furthermore, the banks can also sometimes take into consideration the financial assets of households in their assessment of household payment ability. Because FI lacks such information, this is not possible in FI's analysis.

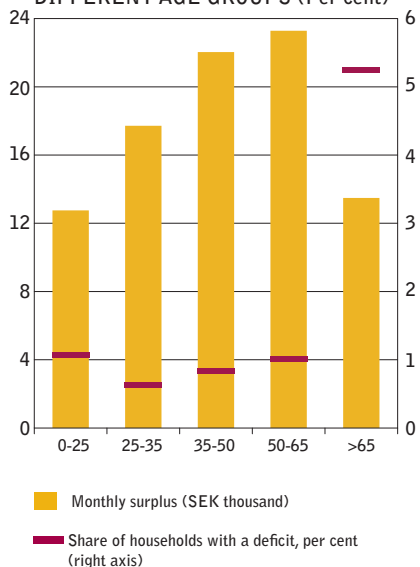
20 The calculation is based on the banks' average standardised costs and using the actual interest rate and actual prepared amortisation plan.

21 The amounts refer to surplus after payment of actual amortisation.

20. MONTHLY SURPLUS IN DIFFERENT INCOME GROUPS (SEK thousand)



21. MONTHLY SURPLUS IN DIFFERENT AGE GROUPS (Per cent)



65 years old) households have the lowest average monthly surpluses (diagram 21). The surpluses for these groups has however increased compared with equivalent groups in 2013. Their surplus now amounts to around SEK 13,000, which can be compared with SEK 10,000 in 2013. In particular, the share of households with a deficit has decreased, now amounting to just over 1 per cent for those under the age 26 and around 5 per cent of those over 65. The corresponding figures for each group in 2013 was 4 per cent and 13 per cent, respectively. For other age groups, the average surpluses amount to SEK 17,000–23,000, and less than 1 per cent of households show a deficit.

## STRESS TESTS

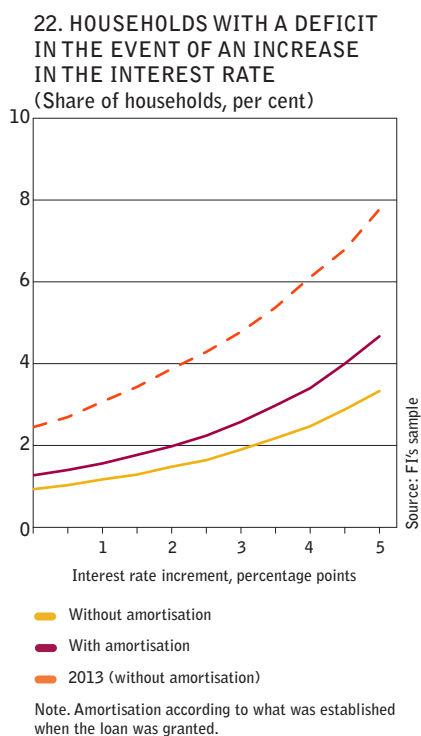
In order to study the resilience of households to changes in their financial circumstances, FI performs so-called stress tests. In the stress tests, FI estimates what would happen to the households' payment ability in the event of rising interest rates, a household being affected by unemployment, or a drop in the value of their home. Rate hikes and unemployment lead to the households having smaller monthly surpluses, while a drop in house prices leads to an increase in their loan-to-value ratio. FI has analysed three negative scenarios: increased interest rate, increased unemployment and a combination of increased unemployment and a drop in house prices. In the first two instances, the share of households that would have a deficit in their monthly calculation is calculated, and in the last instance the share of households that would both have a deficit and a loan-to-value ratio exceeding 100 per cent is calculated.

The fact that a household has a deficit in the stress tests need not mean that it could not cope with paying its loan instalments if a similar scenario were to happen in reality. For example, the household might have savings that could be used to cover temporary deficits. It might also have the possibility of cutting back on consumption or agreeing with the bank on temporarily suspending amortisation instalments and deferring interest payments. A deficit in accordance with FI's calculations can therefore not be equated to credit losses for the banks. At the same time, there may be expenses that the households cannot avoid that are not captured in FI's monthly calculation. A surplus in FI's stress test is therefore no guarantee that households cannot suffer payment difficulty.

### Interest rate sensitivity

Interest rates are currently at historically low levels and there is thus reason to expect them to increase ahead. It is therefore important that households do not take current interest rates for granted when they take out mortgages. In order to cope with increased interest expense, it is important that households have solid margins. They can also protect themselves against higher interest rates by fixing their mortgage rate for a long period of time. However, FI's sample shows that around three out of four households have a fixed interest term of less than a year.

The interest rate sensitivity of households has been calculated by increasing the mortgage rate in order to see how many households would have a deficit in their monthly calculation. The increment to the interest rate is added to the actual interest rate that the household was obliged to pay at the time of loan application. Hence, the highest interest rate increment of 5 percentage points entails an average interest rate of 7.2 per cent, because the average interest rate in the sample was 2.2 per cent. Interest expense in the stress test is based on households' aggregate loans – not



just mortgages – because in a scenario of increasing mortgage rates it is reasonable to assume that interest rates would rise for all household debt. In the stress test, all interest rates are treated as being variable, so the increase to the interest rate affects all loans. The interest rate sensitivity of households is thus overestimated to some extent.

If the interest rate increases by 5 percentage points, the share of households with a deficit rises to just shy of 5 per cent (diagram 22). The debts of such households also equal just below 5 per cent of the total lending volume. If households can suspend their amortisation payments, slightly fewer have a deficit. Borrowers over 65 constitute the age group for which the share of households with a deficit increases the most. As noted previously, it is also this group that have the highest share of households with deficits to start with. Households with a high debt-to-income ratio are also overrepresented among those with a deficit in the event of a 5 per cent increase to the interest rate, which is natural because the debt-to-income ratio can be said to be a measure of interest rate sensitivity. The resilience of households has increased substantially from the previous year, when an increase to the interest rate of 5 percentage points put almost 8 per cent of households into deficit. The difference can be explained to some extent by the fact that interest rates were lower on average in 2014 than in 2013, although the majority of the change is due to a drop in the share of households with small margins (diagram 19).

### Unemployment and fall in house prices

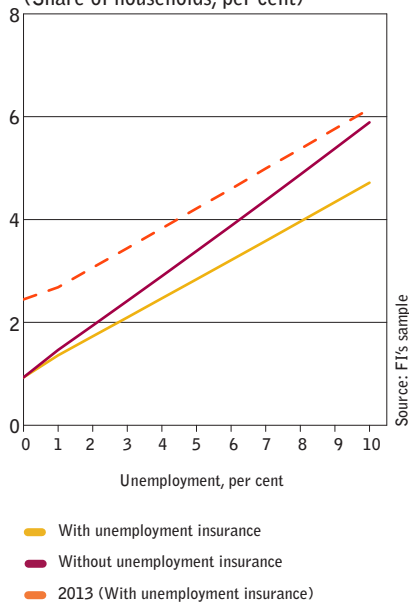
Unemployment can bring about a sharp deterioration in a household's financial situation, especially if those affected do not have unemployment insurance cover. FI has analysed the ability of households to cope with interest payments and other housing and subsistence costs in a simulated increase in unemployment.<sup>22</sup> The stress test is not dependent on present unemployment in Sweden or that in the sample. The risk of households in the sample being affected by unemployment is probably lower than for society at large, because the banks require households to have a solid financial position to be approved a mortgage. The rise in unemployment in the sample thus cannot be interpreted such that Swedish unemployment would rise by a certain number of percentage points from the current level.

In practice, the stress test is a simulation in which a share of borrowers under 67 years of age are randomly assumed to be affected by unemployment, whereupon the income of the household declines.<sup>23</sup> The new

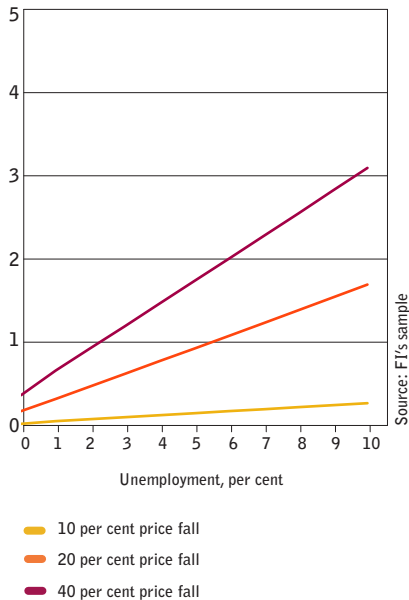
22 In the stress test for unemployment and a decline in prices, it is assumed that households suspend their amortisation payments.

23 FI assumes that 71 per cent of borrowers are covered by an unemployment benefit fund. In terms of unemployment benefit funds, it is assumed that income drops to 80 per cent of original income in the first 200 days and subsequently to 70 per cent of the original salary up to 300 days. Income may however not exceed the maximum amount of SEK 680 per day. 28 per cent of those unemployed are assumed to be in long-term unemployment. Long-term unemployment refers to people who have been unemployed for more than 200 days. Furthermore, it is assumed that the benefits of 34 per cent of those in long-term unemployment expire. The income of these people and those affected by unemployment and who are not covered by an unemployment benefit fund amounts to SEK 320 per day, known as the basic amount. In order to ensure that the outcome is robust, the random selection is repeated 10,000 times. Every borrower under the age of 67 can become unemployed in the stress test, which means that both borrowers in households with more than one adult can be affected. The diagrams show an average of all outcomes.

**23. HOUSEHOLDS WITH A DEFICIT FOLLOWING AN INCREASE IN UNEMPLOYMENT**  
(Share of households, per cent)



**24. HOUSEHOLDS WITH DEFICIT AND LTV OVER 100 PER CENT, COMBINED UNEMPLOYMENT AND FALL IN HOUSE PRICES**  
(Share of households, per cent)



income of the households then forms the basis for a new monthly calculation, and in the same way as for interest rate sensitivity, FI studies how many households would have a deficit. The stress test is performed partly with the assumption that some of the borrowers are covered by unemployment insurance, and partly with the assumption that no borrowers are covered. None of the banks state that they generally require borrowers to have unemployment insurance to be granted a loan.

If 10 per cent of borrowers are assumed to become unemployed, almost 5 per cent of households would have a deficit in their monthly calculation (diagram 23). Such households account for around an equivalent share of the total lending volume in the sample. If none of the borrowers have unemployment insurance cover, the share with a deficit would be around 1 percentage point higher. The share of households with a deficit in equivalent categories was around 2 percentage points higher 2013, which corroborates the view that the margins of households have increased. Because the banks require mortgage holders to have a sound financial position, an unemployment level of 10 per cent among households in the sample would probably imply a much higher level for the population as a whole.

FI also develops the unemployment analysis by combining increased unemployment with declining house prices. The results show the share of households that end up with a deficit in addition to their loan exceeding the value of their home. The analysis attempts to provide an indication of how many households would still be indebted if they were forced into selling their home due to poorer payment ability. As already pointed out, households can in practice adapt in other ways than by selling their homes if their situation changes. If a similar scenario had happened in reality, it is therefore not certain that households in deficit in the analysis would be forced to sell their home.

In a scenario of house prices declining 20 per cent and unemployment increasing to 10 per cent, just shy of 2 per cent of households with new mortgages would have a deficit and simultaneously a loan-to-value ratio exceeding 100 per cent (diagram 24). If prices were to drop double that amount, by 40 per cent, just over 3 per cent of households would have a deficit while the value of their home would be less than their mortgage. The share of households affected by a deficit is somewhat lower than in the equivalent test last year.

On the whole, the stress tests show that households granted a new mortgage currently have sound resilience in general, to negative scenarios such as higher interest rates, increased unemployment or a drop in house prices. Even in the event of severe stress, few households end up with a deficit. All stress tests also show greater resilience among households than in previous years.

## Debt progression over time

Out of the households granted new loans in the period 2011–2013, just over half reduced their debt in 2014, while 20 per cent increased it. One reason for a growing number of households reducing their debt could be that they are following their amortisation plan to a greater extent.

One method of analysing the borrowing and amortisation behaviour of households is to follow the same households over time and study how their debt level changes. Until the autumn of 2014, FI followed households that were granted a new loan in the autumn of 2011, 2012 or 2013, and who had their loans remaining with the same bank until 2013 or 2014. Households that pay off their loans or switch banks thus disappear from the panel. The panel contains households that can be observed for a period of 2, 3 or 4 years. All results in this chapter are based on this data. The panel differs from the sample because information about the size of and terms for the households' loans is updated.<sup>24</sup>

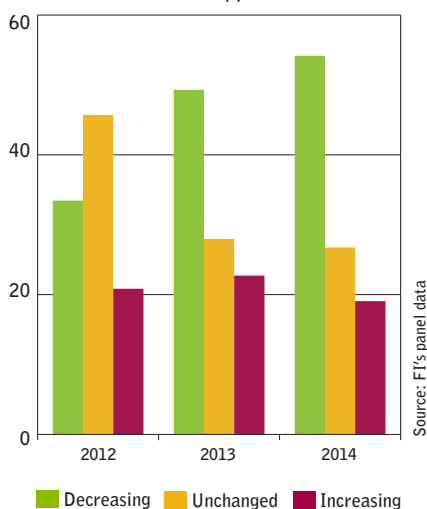
According to the information in the panel, debt decreased for more than half of the households in 2014, which is a greater share than in 2013 and a much greater share than in 2012, when only around a third of households reduced their debt (diagram 25). This could be a sign of changed amortisation behaviour, but it could also be the case that households do not start to amortise immediately when they are granted their loan, but start later. The increase in the share of households that reduced their debt is largely matched by a reduction in the share of households with unchanged debt. This redistribution between amortising and not amortising does not appear to have affected the share of households that increased their debt however, which amounted to around 20 per cent for all years.

It was more common for households with a high loan-to-value ratio to reduce their debt than households with a low loan-to-value ratio (diagram 26). Out of households with a loan-to-value ratio over 85 per cent in 2013, 71 per cent reduced their debt in the following year. The corresponding percentage for households with a loan-to-value ratio between 0 and 50 per cent was 47 per cent. At the same time, it was considerably more common for households with a low loan-to-value ratio to have unchanged debt. For households that increased their debt, it is not possible to see any direct link to the loan-to-value ratio of the previous year.

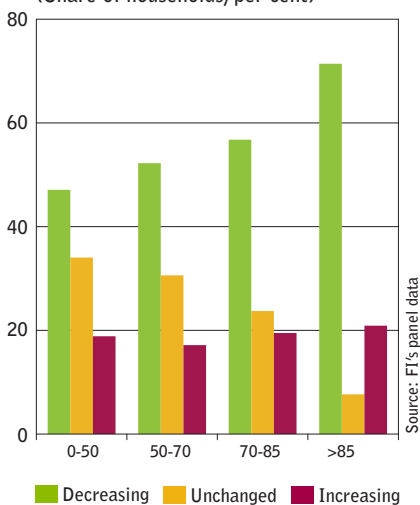
The households which increased their debt in 2014 had an average loan-to-value ratio of 63 per cent the year before. Their average loan-to-value ratio does not differ considerably from the households with unchanged or reduced debt, which had an average loan-to-value ratio of 56 and 67 per cent, respectively. In previous years, the pattern was somewhat different (diagram 27). Then, households that increased their debt had a clearly lower average loan-to-value ratio than those that reduced their debt.

Out of those under the age of 65, the percentage of households that reduced their debt in 2014 was around 56 per cent. For those over the age of

25. DISTRIBUTION OF CHANGE IN DEBT FOR DIFFERENT YEARS (Share of households, per cent)



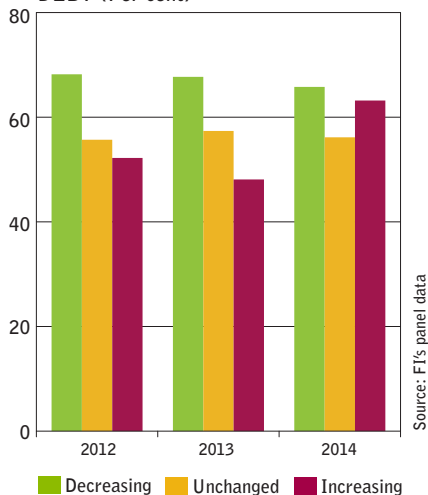
26. DISTRIBUTION OF DEBT CHANGE IN 2014 FOR DIFFERENT LOAN-TO-VALUE RATIOS (Share of households, per cent)



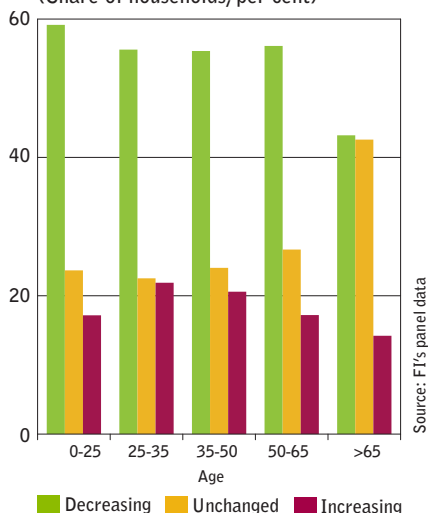
Note. Refers to loan-to-value ratios in 2013

<sup>24</sup> Information about household income and collateral value for the loans can also be updated, but this is not done on an ongoing basis for all households. Hence, debt-to-income ratios and loan-to-value ratios will be overestimated as a result of income increases and rising house prices.

27. LOAN-TO-VALUE RATIO FOR HOUSEHOLDS WITH DECREASING, UNCHANGED AND INCREASING DEBT (Per cent)



28. DISTRIBUTION OF DEBT CHANGE 2014 FOR BORROWERS OF DIFFERENT AGES (Share of households, per cent)



65, the corresponding share was only 43 per cent (diagram 28). At the same time, it was much more common for the older borrowers to have unchanged debt. An underlying reason for the differences in debt change could be the extent of leverage, whereby borrowers in the 0–25 and 26–35 age groups had an average loan-to-value ratio of over 75 per cent, while for those over the age of 65 the figure was 42 per cent. It might also be because older households, no matter their leverage, does not have the same need to save as younger households.

In the panel, there is no clear link between level of income and debt reduction. Irrespective of the income decile, 50–60 per cent of households reduced their debt in 2014 (diagram 29). However, around 30 per cent of low-income households had an unchanged debt level compared with around 20 per cent of high-income households. At the same time, the percentage that increased their debt was around 10 per cent for low-income households compared with 20 per cent for high-income households. On the whole, this indicates that income is significant to the willingness or ability to extend the volume borrowed, but it has no direct bearing on loan repayment.

Around 40 per cent of the households in the panel do not amortise on a regular basis, i.e. they have no amortisation plan (diagram 30). The share increased from 37 per cent in 2012 to 46 per cent in 2014, despite amortisation having increased for households with new mortgages. However, the panel largely consists of households granted loans in 2011, when amortisation was less common. For households with amortisation plans, the share of households that have followed their plan has increased, and the share that has amortised less than their plan has decreased. The share of households that have amortised in excess of plan has been around 10 per cent for all years.

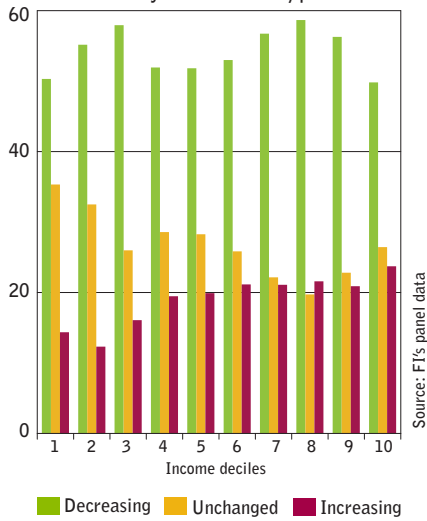
**FI's panel data**

The 2014 panel data contains information about households during 2011–2014, with measurement performed in September each year. The panel has been built up by means of topping it up with updated information regarding current debt and amortisation for 2012–2014 for households included in the 2011 sample and which still have their loans. The panel has also been topped up with information for 2012–2014 for households included in the 2012 and 2013 samples. There is a need to top it up with new households mainly because some households switch banks or pay off their loans. Because of this, households exit the panel each year.

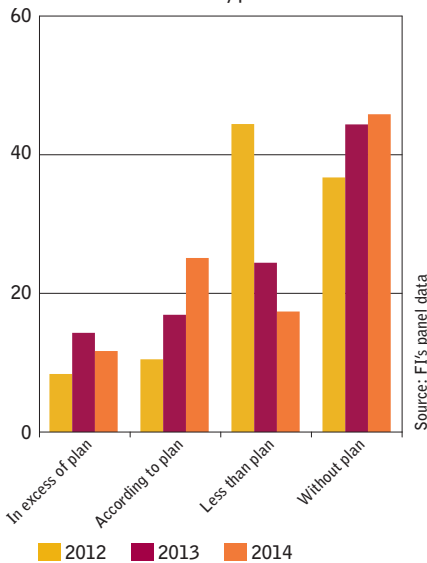
The panel contains information about the households' debt for several years, which makes it possible to follow their debt over time. There is however households that to a large extent repay their loans and households that significantly increase their loans due to them purchasing or selling houses. This makes the average changes in volume for those that increase or decrease their debt very large and difficult to interpret. FI therefore only report the share of households that increase or decrease their debt and not how much the volume of the households' debt changes.

The panel contains a total of 12,319 households for 2013, for which 11 405 remains 2014. The 2011 sample selection contains 7,969 households, 7,201 of which are included in all four years. The 2012 sample selection contains 2,565 households, 2,419 of which are included for three years. The 2013 sample selection contains 1,785 households, who are thus included for two years.

29. DISTRIBUTION OF DEBT CHANGE 2014 IN DIFFERENT INCOME DECILES (Share of households by income decile, per cent)



30. AMORTISATION IN RELATION TO AMORTISATION PLAN (Share of households, per cent)



Note. Refers to actual debt change in relation to the amortisation plan established when the loan was granted.

TABLE 3. Distribution of households between years and samples (number of households)

Sample	2011	2012	2013	2014
2011	7,969	7,969	7,969	7,201
2012		2,565	2,565	2,419
2013			1,785	1,785
All samples	7,969	10,534	12,319	11,405

This is the first time that FI has topped up the panel with information for households from samples of recent years in order to create a larger panel. Hence, it is also the first time that FI has opted to perform the debt progression analysis on an "imbalanced panel". The method, however, is the same as in previous years. It is based on calculating debt progression by comparing the debt level for two adjacent years. Yet, using an imbalanced panel means that household characteristics can vary between samples and years. For this reason, FI has conducted a review both of the households that exit the panel before 2014 and those that enter after 2011. There is nothing in the review to indicate substantial differences between each sample and the households included in the 2011 sample and which can be monitored for four years.

## Appendix 1 – FI’s monthly calculation

The banks’ discretionary income calculation contains detailed information about mortgage holders’ household-specific information that is registered upon loan application. This includes actual tenant-owner apartment charges and operating costs for the individual household. In the absence of information, the banks use standardised costs, depending on household size and composition, and type of home. FI’s monthly calculation employs an average of these standardised costs (see below) for all households of the same type. The standardised costs only take into account the type of home, and not its size. Because the size of a home can have a major bearing on costs, such as for heating, FI’s calculations does not become as precise as those of the banks for individual households.

TABLE 1 FI’s standardised costs in the monthly calculation, SEK

	2014	2013	Swedish Consumer Agency
Cost of living			
1 adult	8,100	8,000	5,600
2 adults	13,950	13,850	9,800
per child	3,100	2,900	2,800
Operating expenses			
Single-family dwellings	3,950	4,100	
Tenant-owned apartments	3,200	3,450	
Holiday homes	1,900	1,450	

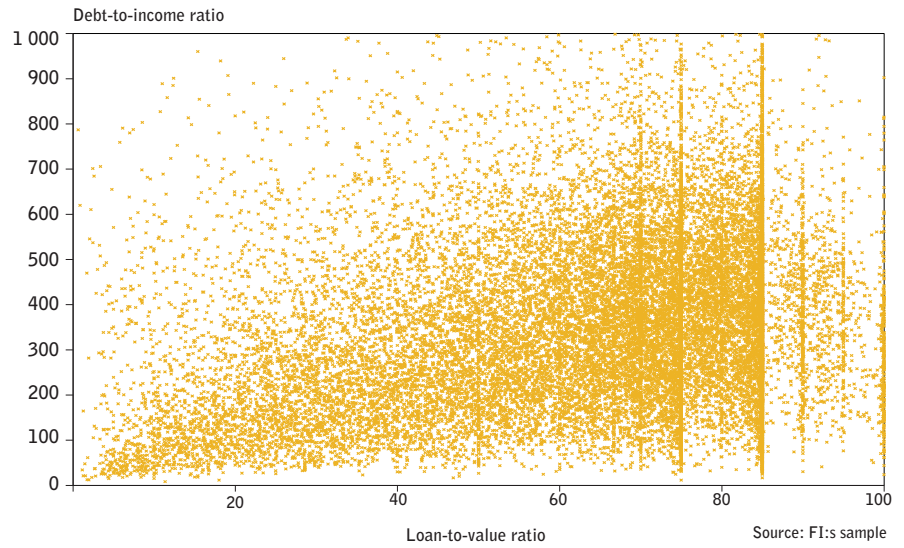
The standardised costs in the table are based on an average of the standardised costs stated by the banks. Corresponding standardised costs from last year’s survey, and the estimation of the Swedish Consumer Agency of the costs of attaining a reasonable consumption standard, are shown to the right.



## Appendix 2 – Correlation between loan-to-value ratio and debt-to-income ratio

The diagram below shows the loan-to-value ratio and debt-to-income ratio for each household in the survey, respectively. Each dot represents one household.

DIAGRAM B2. Relationship between loan-to-value ratio and debt-to-income ratio, new loans



## Glossary

**Debt service ratio** The debt service ratio is calculated as the sum of the household's interest and amortisation expenses in relation to their disposable income.

**Debt-to-income ratio** A measure of indebtedness that is defined as households' total debt in relation to their annual disposable income.

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

**Disposable income** A household's income after tax before paying for all borrowing costs, housing costs and other possible maintenance obligations. 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.

**Imputed rate of interest** An interest rate used in the banks' calculation of discretionary income to determine households' interest expenses. This interest rate is higher than the current interest rate to test the resilience of households to interest rate increases.

**Income decile** Income deciles are created by sorting households according to their disposable income. Each income decile contains one tenth of the households in the sample, where income decile 1 contains households with the lowest income, and income decile 10 the households with the highest income.

**Interest-to-income ratio** The interest-to-income ratio is calculated as the household's interest rate expenses divided by their disposable income, and shows how much of their income the households commit to their interest rate expenses.

**Loan-to-value ratio** The ratio between the size of the mortgage and the market value of the home. In the survey, the calculation of the loan-to-value ratio differs slightly between the sample and the data for existing loans (mortgage stock). For existing loans the loan-to-value ratio is calculated based on the loans collateralised by homes. In the sample, any unsecured loans attributable to financing a home have also been included in the loan-to-value ratio calculation.

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

**New loans** New loans or strictly new loans refer to new mortgages acquired by either new or existing borrowers. For existing borrowers, the new loan may refer to a loan on either new 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 switching banks. It is not possible to distinguish these loans from other loans and they are therefore included in FI's data. Renegotiated loans or existing loan agreements that are prolonged 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 among 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 cost** Estimated average amounts for various accommodation and subsistence costs that the bank uses in its discretionary income calculation.

**Unsecured loan** A loan granted without any collateral or guarantee. In this survey, unsecured loans only include loans issued at the same time as a loan that is collateralised by a home or that can be related to financing a home in any other way.



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