



**FINANSINSPEKTIONEN**

# The Swedish Mortgage Market

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**4 APRIL 2018**





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## Summary

Finansinspektionen (FI) follows the development of household debt on an ongoing basis. The mortgage survey serves as an important source of data for this work. High debt can mean risks for individual households, banks, financial stability and the macroeconomic development.

Household debt has been rising for a long time at a higher rate than household disposable income. One important reason for this is that house prices have been rising rapidly. In order to manage the risks associated with household debt, FI has taken several measures, such as a mortgage cap, raising the risk weights on mortgages and, in June 2016, the introduction of an amortisation requirement. These measures have made households with new mortgages more resilient. In order to further strengthen the resilience of households, FI introduced a stricter amortisation requirement on 1 March 2018.

The average loan-to-value ratio for new mortgagors decreased slightly in recent years and was 63 per cent in 2017. For the total stock of mortgages, the loan-to-value ratio has been decreasing over a period of several years and amounted to 55 per cent in 2017. For households with new mortgages, debt in relation to net income (debt-to-income ratio) on average was 411 per cent of net income in 2017. This was an increase from 402 per cent in 2016. The number of new mortgagors with a high level of debt in relation to their income or in relation to the value of their home continues to be high. These households may amplify a future crisis by sharply reducing their consumption.

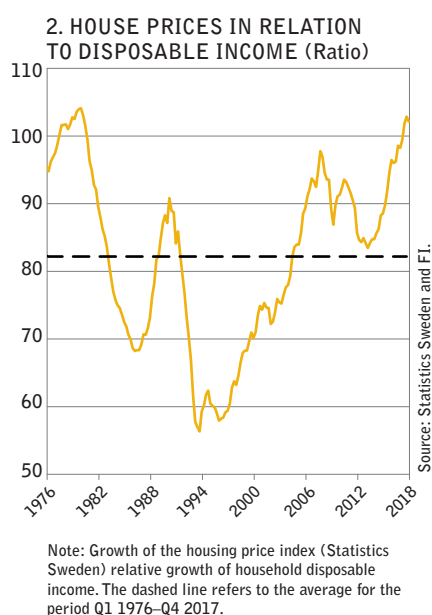
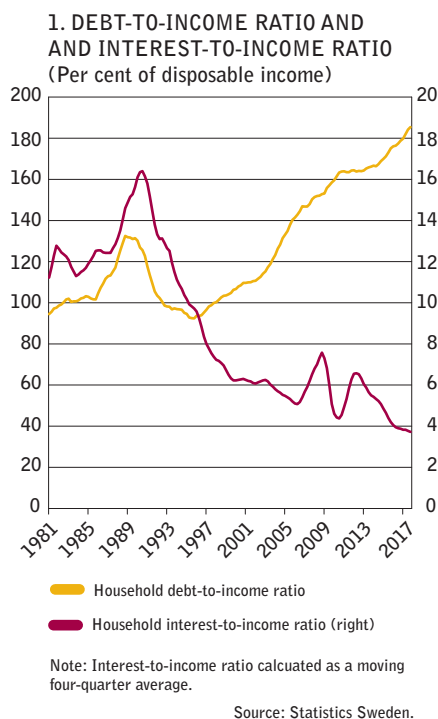
The percentage of households that amortise and the average size of the amortisation payments increased following the implementation of the amortisation requirement in 2016 and remained at the same level in 2017. FI's analysis shows that households with new mortgages that are subject to the amortisation requirement borrow less and buy less expensive homes than what they would have done without the amortisation requirement.

According to FI's stress tests, households with new mortgages are able to make their payments on their mortgages by a strong margin. Compared to previous years, more households can handle rising interest rates and unemployment without their monthly expenses exceeding their budget.

Household resilience indicates a limited risk that banks will experience widespread losses from household mortgages. However, households may reduce their consumption if their circumstances deteriorate, and such a development would thus have a negative effect on the state of the economy.

## Background

Debt can pose risks for individual households, banks, financial stability and macroeconomic growth. Swedish household debt increased rapidly over a long period of time and in February 2018 amounted to SEK 3,836 billion. This corresponds to 83 per cent of GDP. Mortgages represent 82 per cent of total household debt. The mortgage survey serves as an important source of data when FI analyses household debt. This report presents the results from the 2017 mortgage survey.



Most households that buy a home need a mortgage. It is important for the credit market to function well so households can distribute their consumption across different phases of their lives. However, large debt poses risks for both individual households and banks, as well as for the economy at large. With the exception of the years 2010–2014, household debt increased at a faster rate than household income for more than 20 years. One of the main underlying causes of higher debt is rising house prices, which were stimulated by falling interest rates (Diagram 1 and 2). Rising income and population growth also contributed to the rising house prices and growing debt. Debt also increased due to the financing of more new construction and conversions of rental apartments to tenant-owner apartments.

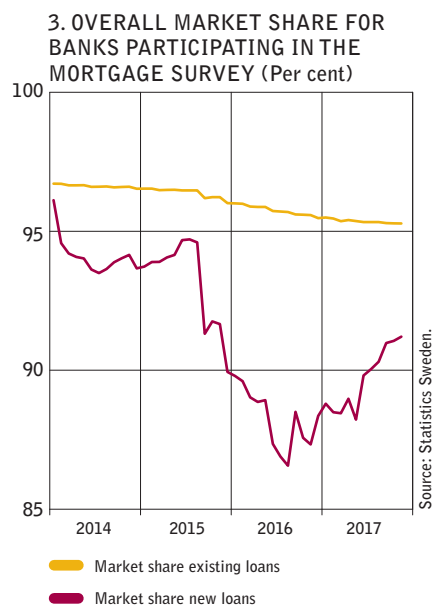
FI has taken measures over time to mitigate the vulnerabilities posed by high household debt. These measures strengthen the resilience of both households and banks. In 2010, FI introduced a mortgage cap, according to which new loans collateralised by a home should not exceed 85 per cent of the market value of the home.<sup>1</sup> We also introduced a risk-weight floor for mortgages. This floor ensures that banks hold more equity for lending via mortgages. On 1 June 2016, FI introduced an amortisation requirement. According to this requirement, households borrowing more than 50 per cent of the residential property's value must amortise at least 1 per cent of their mortgage a year, while households borrowing more than 70 per cent must amortise at least 2 per cent a year.<sup>2</sup> On 1 March 2018, FI introduced a stricter amortisation requirement following approval by the Government.<sup>3</sup> According to this stricter requirement, households borrowing more than 4.5 times their annual income before tax must amortise an additional 1 per cent of their mortgage a year.

In order to obtain a good overview of households' vulnerabilities, it is not enough to study aggregate statistics. The mortgage survey contains detailed data about debt levels of households with new mortgages and is an important part of FI's analysis of the risks and vulnerabilities.

### PURPOSE AND DATA

The purpose of the mortgage survey is to describe the current situation for households that have just taken out a new mortgage. The survey

- 1 It is possible to be granted an unsecured loan to finance the purchase of 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 FFFS 2016:16.
- 3 FFF 2017:23. Regulations amending Finansinspektionen's regulations (FFFS 2016:16) regarding amortisation of loans collateralised by residential property.



contains information about both the households' new mortgages at the time of the survey and the existing mortgages these households had from before. FI uses the data from the survey to assess the need to amend the rules on the mortgage market. The information is also used to evaluate measures that have already been implemented. In addition, the survey also provides an important basis for FI's supervision of and dialogue with banks. This report presents the data as a total for all banks.

FI estimates the payment capacity of the households included in the sample through stress tests and the use of a discretionary income calculation similar to the one used when the banks grant mortgages. As part of its stress tests, FI analyses the sensitivity of households to interest rate hikes, loss of income due to unemployment and a fall in house prices. The payment capacity of households is an important element in being able to assess the households' resilience and the banks' credit risks.

The survey includes data from Danske Bank, Handelsbanken, Länsförsäkringar Bank, Nordea, SBAB Bank, SEB, Skandiabanken and Swedbank. These banks represent almost 95 per cent of the total lending for residential properties and 91 per cent of new lending. Their market shares have decreased slightly over time (Diagram 3). This may be because these banks have applied stricter credit assessment and competition from other mortgage companies has increased.

The data consists of three sections:

- *Household sample (microdata)*. The sample includes all new mortgage agreements entered into during the periods 26 August–2 September 2017 and 28 September–5 October 2017. After processing, the data for the 2017 survey contained 27,822 households.<sup>4</sup> The information consists of household income, total loans, loans collateralised by residential property, housing-related unsecured loans, agreed interest rates and amortisation payments, the market value of the residential property and the composition of the household. This is the eighth time FI has compiled such a sample. The previous samples were collected in 2009 and 2011–2016.
- *Aggregate data*. FI also gathers data about the banks' total lending to households for housing purposes. This data includes, for example, total lending volumes, amortisation volumes and loan-to-value ratios. FI has gathered aggregate data since 2006. The data stretches back in time to 2002.
- *Qualitative information*. The banks provide both general and detailed information by answering a number of in-depth questions. These questions are related to the banks' methods for valuing residential properties, credit assessments of households and consumer protection aspects of mortgage lending. FI also gathers information about the banks' view on high loan-to-value ratios and amortisation payments.

Tables 1 and 2 describe the households in the 2017 sample of new mort-

<sup>4</sup> "Processing" refers to the data processing techniques FI applies to all reported data. Deficient, extreme or incorrect observations are removed during this process.

gagors. Table 2 compares the borrowers' average income, debt and market value of their residential properties to previous samples. The average disposable income for households in the 2017 survey was SEK 44,429/month. This is 3.6 per cent higher than in 2016. Average debt amount to more than SEK 2.3 million. This was 6.1 per cent higher than in 2016. Households in the 2017 survey purchased homes that on average were 7.4 per cent more expensive than in 2016.<sup>5</sup> Since 2012, new mortgagors in the survey have purchased significantly more expensive residential properties and have higher debt. Debt and the price of the residential properties the households are buying have increased significantly more than household disposable income.

TABLE 1. Geographic distribution of borrowers in the sample<sup>6</sup>

|  | Stock-<br>holm | Goth-<br>enborg | Malmö     | Other<br>large<br>cities | Rest of<br>Sweden | Total     |
|--|----------------|-----------------|-----------|--------------------------|-------------------|-----------|
| Share of households (%)                | 27             | 11              | 6         | 20                       | 36                | 100       |
| Share of volume of new loans (%)       | 40             | 13              | 7         | 17                       | 24                | 100       |
| Average debt (SEK)                     | 3,213,270      | 2,633,722       | 2,222,552 | 2,013,659                | 1,538,695         | 2,251,810 |
| Households with one borrower           | 2,219,560      | 1,840,772       | 1,516,033 | 1,383,772                | 1,072,719         | 1,567,696 |
| Households with more than one borrower | 3,780,054      | 2,981,364       | 2,630,677 | 2,326,547                | 1,779,814         | 2,608,983 |
| Average market value of home (SEK)     | 5,084,111      | 4,062,296       | 3,165,063 | 2,735,925                | 1,981,327         | 3,276,601 |
| Households with one borrower           | 3,926,358      | 3,172,076       | 2,268,246 | 2,026,283                | 1,481,356         | 2,508,127 |
| Households with more than one borrower | 5,744,460      | 4,452,583       | 3,683,116 | 3,088,431                | 2,240,037         | 3,677,818 |
| Average disposable income (SEK)        | 49,991         | 46,594          | 44,337    | 43,121                   | 40,227            | 44,429    |
| Households with one borrower           | 32,136         | 28,841          | 27,578    | 26,962                   | 25,544            | 28,184    |
| Households with more than one borrower | 60,175         | 54,378          | 54,017    | 51,148                   | 47,825            | 52,910    |

<sup>5</sup> In Q4 2017, following the compilation of data for the mortgage survey, house prices fell throughout the entire country by approximately 8 per cent compared to the end of Q3. In September 2017, the increase in prices for residential properties for the country as a whole was 6.7 per cent at an annual rate (Valueguard Composite Index).

<sup>6</sup> In this report, "Stockholm" refers to the 26 municipalities that constitute the Greater-Stockholm area. "Gothenburg" refers to the 13 municipalities that constitute the Greater-Gothenburg area. "Malmö" refers to the 12 municipalities that constitute the Greater-Malmö area. "Other large cities" includes the municipalities of Borås, Eskilstuna, Gävle, Halmstad, Helsingborg, Jönköping, Karlstad, Kristianstad, Linköping, Norrköping, Sundsvall, Umeå, Uppsala, Västerås, Växjö and Örebro. "Rest of Sweden" includes the municipalities that have not already been mentioned in the above categories.

TABLE 2. Age distribution of borrowers in the sample

|  | 18-30     | 31-50     | 51-65     | 65+       | Total     |
|--|-----------|-----------|-----------|-----------|-----------|
| Share of households (%)                | 18        | 48        | 25        | 10        | 100       |
| Share of volume of new loans (%)       | 19        | 55        | 21        | 6         | 100       |
| Average debt (SEK)                     | 1,866,834 | 2,585,325 | 2,225,136 | 1,406,360 | 2,251,810 |
| Households with one borrower           | 1,313,073 | 1,758,280 | 1,662,357 | 1,158,794 | 1,567,696 |
| Households with more than one borrower | 2,236,674 | 2,912,114 | 2,571,069 | 1,628,525 | 2,608,983 |
| Average market value of home (SEK)     | 2,250,226 | 3,622,664 | 3,450,689 | 3,262,621 | 3,276,601 |
| Households with one borrower           | 1,789,498 | 2,606,149 | 2,820,181 | 2,937,559 | 1,481,356 |
| Households with more than one borrower | 2,496,128 | 3,984,744 | 3,815,817 | 3,475,091 | 3,677,818 |
| Average disposable income (SEK)        | 36,338    | 48,568    | 46,893    | 33,905    | 44,429    |
| Households with one borrower           | 23,647    | 30,094    | 30,388    | 25,351    | 28,184    |
| Households with more than one borrower | 45,594    | 55,581    | 56,070    | 41,347    | 52,910    |

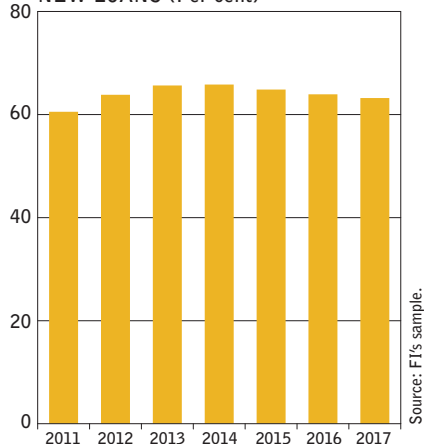
TABLE 3. Borrowers' average income, debt and market values in previous samples

|   | 2012      | 2013      | 2014      | 2015      | 2016      | 2017      |
|---|-----------|-----------|-----------|-----------|-----------|-----------|
| Average disposable income per household (SEK/month) | 39,421    | 38,634    | 39,919    | 41,750    | 42,893    | 44,429    |
| Since the previous year (%)                         |           | -2.0      | 3.3       | 4.6       | 2.7       | 3.6       |
| Since 2012 (%)                                      |           | -2.0      | 1.3       | 5.9       | 8.8       | 12.7      |
| Average debt (SEK)                                  | 1,659,422 | 1,703,157 | 1,893,998 | 2,071,351 | 2,122,680 | 2,251,810 |
| Since the previous year (%)                         |           | 2.6       | 11.2      | 9.4       | 2.5       | 6.1       |
| Since 2012 (%)                                      |           | 2.6       | 14.1      | 24.8      | 27.9      | 35.7      |
| Average market value of home (SEK)                  | 2,221,049 | 2,332,598 | 2,519,224 | 2,864,292 | 3,052,181 | 3,276,601 |
| Since the previous year (%)                         |           | 5.0       | 8.0       | 13.7      | 6.6       | 7.4       |
| Since 2012 (%)                                      |           | 5.0       | 13.4      | 29.0      | 37.4      | 47.5      |

## Swedish mortgage holders

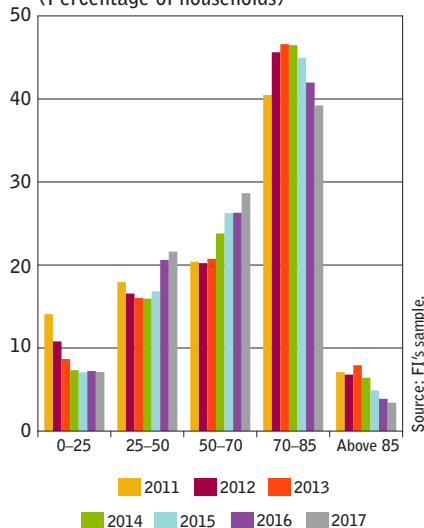
The average loan-to-value ratio for households with new mortgages continued to decrease slowly. It was approximately 63 per cent in 2017. However, their debt-to-income ratios increased slightly after decreasing in 2016. The average debt-to-income ratio in 2017 was 411 using net income. Using gross income, the ratio was 300 per cent. The percentage of new mortgagors with a high loan-to-value ratio or a high debt-to-income ratio continues to be high.

4. AVERAGE LOAN-TO-VALUE RATIO, NEW LOANS (Per cent)



Note: Arithmetic mean.

5. HOUSEHOLDS BY LOAN-TO-VALUE RATIOS, NEW LOANS (Percentage of households)



Household debt can be set in relation to other variables to compare households over time. The loan-to-value ratio is calculated as the size of the loan used to finance the purchase of the residential property divided by the market value of the property. The loan-to-value ratio demonstrates how vulnerable a household is to a fall in house prices. If house prices were to fall to the extent that the value of the home is less than the mortgage, there is a risk that the household would find itself in a weakened financial position. To reduce this vulnerability, the household can choose to amortise more or increase other savings. This means that the household will need to decrease its consumption. If many households were to follow the same behaviour pattern, this could result in weak macroeconomic growth.

The debt-to-income ratio is another measure of household debt. A high debt-to-income ratio means that the household must dedicate a larger portion of its income to interest rate expenses at a given interest rate level. The debt-to-income ratio, therefore, shows how vulnerable a household is to increases in interest rates and a loss of income.

The debt-to-income ratio can be calculated as debt in relation to net income (after tax) or gross income (before tax). From an economic perspective, a debt-to-income ratio based on net income offers the best information. It is based on the actual income a household has to pay off its debt. However, the stricter amortisation requirement, which went into effect on 1 March 2018, is based on gross income, since this figure is easier for borrowers and banks to calculate.<sup>7</sup>

### LOAN-TO-VALUE RATIO CONTINUED TO DECREASE

The average loan-to-value ratio for new mortgagors was 63 per cent in 2017 (Diagram 4). The ratio had decreased four percentage points since 2013. The percentage of households with a loan-to-value ratio above 50 per cent also decreased slightly, but was still high (Diagram 5).

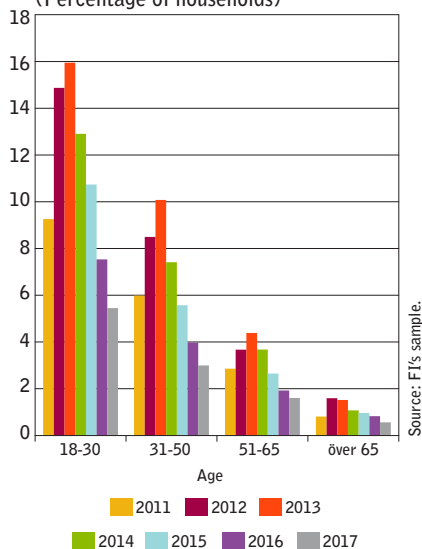
After the amortisation requirement in 2016, the percentage of households with a loan-to-value ratio of more than 70 per cent decreased. Households that have a loan-to-value ratio of more than 85 per cent also have an unsecured loan.<sup>8</sup>

<sup>7</sup> The stricter amortisation requirement is based on a loan-to-income ratio, not the debt-to-income ratio that is used in this report.

<sup>8</sup> FI includes unsecured loans related to mortgages when calculating the loan-to-value ratio. The unsecured loans included in this calculation are unsecured loans from the bank providing the mortgage and that were issued in conjunction with the purchase of the residential property. If the household was issued an unsecured loan by another institution, this loan is not included in the calculation.

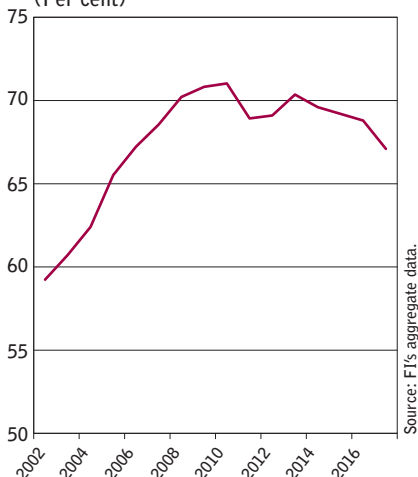


### 6. UNSECURED LOANS BY AGE GROUP, NEW LOANS (Percentage of households)

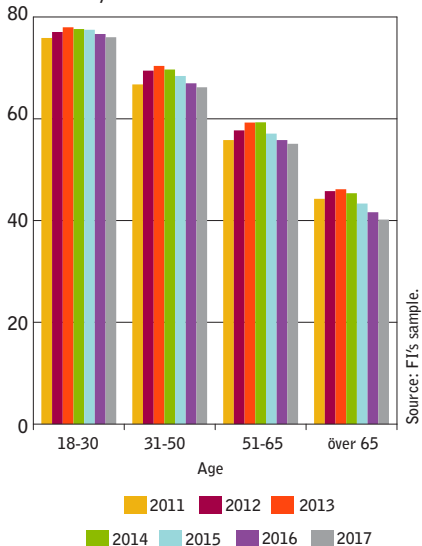


Note: Percentage of households in each age interval with an unsecured loan.

### 7. AVERAGE VOLUME-WEIGHTED LOAN-TO-VALUE RATIO, NEW LOANS (Per cent)



### 8. LOAN-TO-VALUE RATIOS BY AGE GROUP, NEW LOANS (Per cent)



The percentage of households with a loan-to-value ratio of more than 85 per cent has decreased over a period of several years and continued to decrease in 2017.

Unsecured loans corresponded to around 0.4 per cent of the total new loans in the 2017 survey. The percentage of households with unsecured loans was 2.7 per cent, a decrease of one percentage point compared to the previous year. Younger households with new mortgages used unsecured loans more than other households (Diagram 6), but the percentage of young households issued an unsecured loan in conjunction with a mortgage has decreased sharply since 2013. The average unsecured loan for new mortgagors with unsecured loans was approximately SEK 160,000 in 2017. This figure is more or less the same as in 2016.

FI also calculates a volume-weighted average loan-to-value ratio for households with new mortgages.<sup>9</sup> The volume-weighted loan-to-value ratio was 67 per cent in 2017 (Diagram 7). This has decreased since FI introduced the mortgage ceiling in 2010.

The loan-to-value ratios were slightly lower in all age categories in 2017 (Diagram 8).<sup>10</sup> In general, the loan-to-value ratio is lower in households with older borrowers. This is because households who have just started their residential property and professional careers often have limited savings to use as a downpayment and therefore need a larger loan. Through the appreciation of previous residential properties, amortisation payments and other savings, older borrowers have accumulated a larger downpayment for purchasing a residential property.

Households in different income groups had approximately the same loan-to-value ratios (Diagram 9). There were also relatively small differences between households with one adult and households with several adults. One explanation for this is that borrowers with higher income also buy more expensive residential properties.

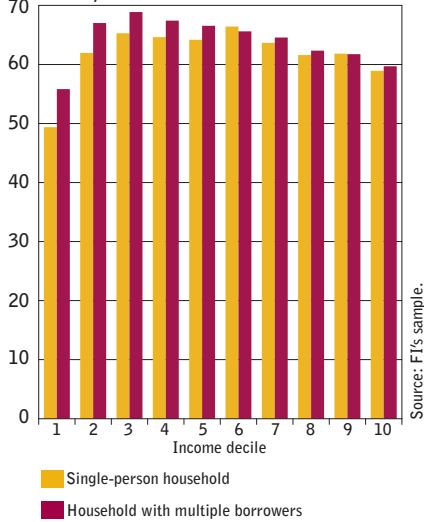
The loan-to-value ratio for new mortgages was slightly lower in all regions in 2017 (Diagram 10). The average loan-to-value ratio was lowest in Gothenburg and Stockholm, where house prices are highest. The highest loan-to-value ratios were in regions where house prices are lowest. One possible explanation is that there are many households in the larger cities that made significant capital gains from price increases for previous residential properties. They are thereby able to lower their loan-to-value ratio by using a higher cash deposit when purchasing a home.

It is also possible to calculate loan-to-value ratios for the total outstanding volume of existing mortgages through the aggregate data in the mortgage survey. Existing mortgages were concentrated to borrowers with loan-to-value ratios between 50 and 75 per cent (Diagram 11). The average loan-to-value ratio was just under 55 per cent in 2017. This was a decrease of three percentage points compared to the previous year. The decrease in the loan-to-value ratio is primarily the result of

9 The volume-weighted loan-to-value ratio is determined by first calculating the average loan-to-value ratio for each bank's total new lending. Each bank's loan-to-value ratio is then weighted based on the market shares of total new lending.

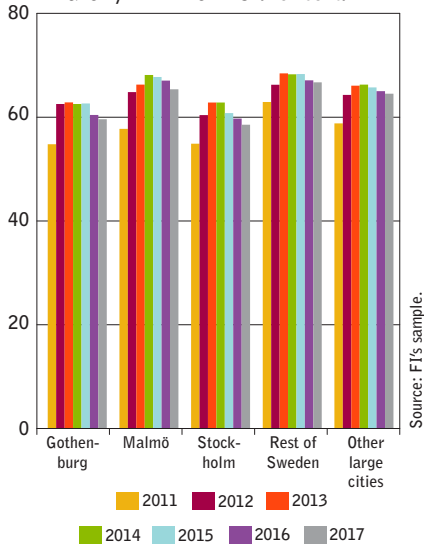
10 FI breaks down households into different age groups based on the age of the primary borrower. Each bank has its own definition of the primary borrower in a household with several borrowers.

9. LOAN-TO-VALUE RATIOS BY INCOME GROUP AND HOUSEHOLD TYPE, NEW LOANS (Per cent)

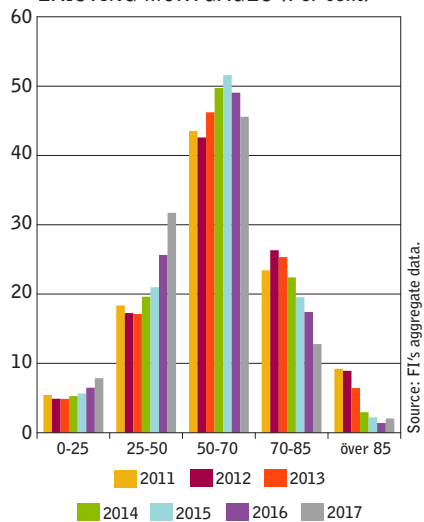


Note: Upper limit for each income decile, net income per month. See page 23.

10. LOAN-TO-VALUE RATIO BY REGION, NEW LOANS (Per cent)



11. HOUSEHOLD BY LOAN-TO-VALUE RATIO, EXISTING MORTGAGES (Per cent)



banks regularly increasing the market values of existing borrowers' residential properties when house prices increase. Amortisation also helped lower the loan-to-value ratio for existing loans.

Increasing number of young new mortgagors

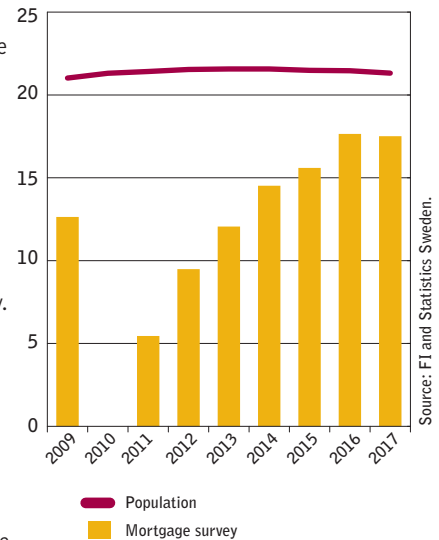
There is a concern that high prices and regulations may have made it difficult for young, first-time home buyers to enter the housing market. FI cannot study the situation of young adults on the rental market using the mortgage survey, and the mortgage survey does not identify first-time home buyers, either. However, it is possible to analyse data about young adults who were granted a mortgage to purchase a residential property.

In 2009, 13 per cent of new mortgagors in the survey were younger than 30 (Diagram B1.1). This percentage decreased to 5 per cent in 2010. This decrease coincided with FI's introduction of a mortgage cap of 85 per cent of the value of the property. Young adults usually have smaller savings than older adults and thus greater difficulty financing the remaining 15 per cent.

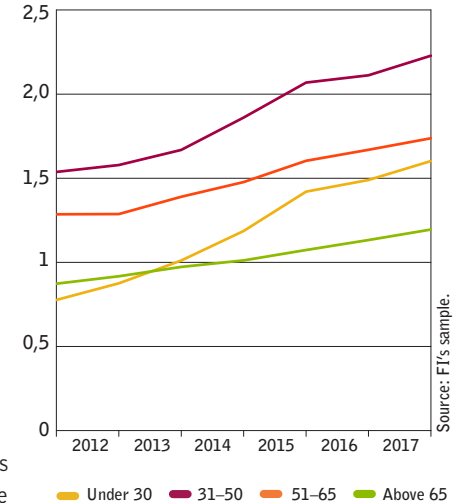
Since 2011, the percentage of young mortgagors has increased steadily. At the same time, the percentage of mortgagors over the age of 50 decreased correspondingly. The increase in young mortgagors is not due to changes in the demography. The percentage of young adults in the population has been stable during the period in question. Young adults have also doubled their average loans since 2011 (Diagram B1.2). This is a faster increase than in any other age group.

The higher percentage of young adults and the increasing size of their loans is a sign that the situation on the housing market for this age group may have improved, but it is still conceivable that they may have been forced to use co-signers to a greater extent than before to be able to buy their home. According to the mortgage survey, it has not become more common for young adults to use co-signers from outside the household. This percentage has been 10 per cent since 2011. However, the share of households with co-signers within the household increased from 40 per

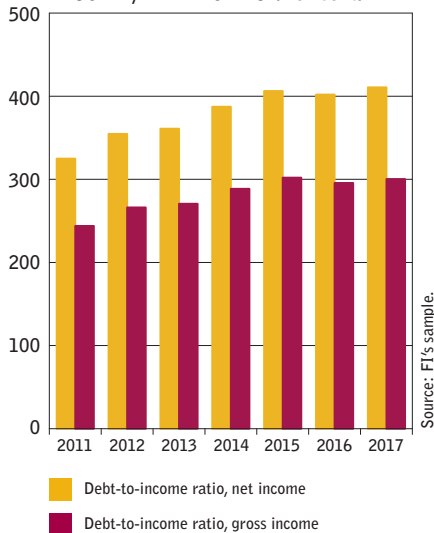
B1.1. PERCENTAGE OF YOUNG ADULTS (Per cent)



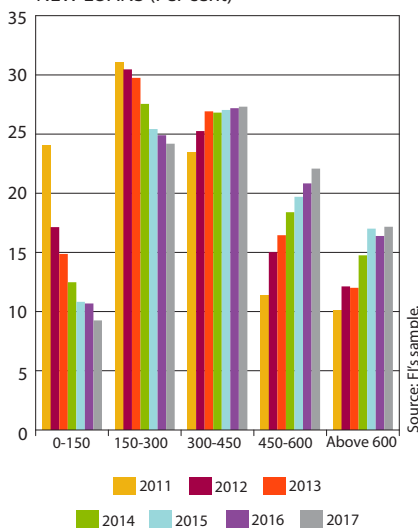
B1.2. AVERAGE LOAN AMOUNT BY AGE GROUPS (SEK millions)



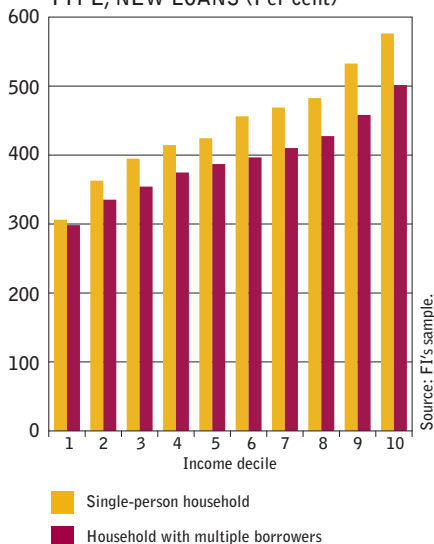
12. AVERAGE DEBT-TO-INCOME RATIO BASED ON GROSS AND NET INCOME, NEW LOANS (Per cent)



13. HOUSEHOLDS BY DEBT-TO-INCOME RATIO, NET INCOME, NEW LOANS (Per cent)



14. DEBT-TO-INCOME RATIO BY INCOME GROUP AND HOUSEHOLD TYPE, NEW LOANS (Per cent)



Note: Upper limit for each income decile, net income per month. See page 23.

cent in 2011 to 55 per cent in 2017. For households in the older age groups, this percentage has not changed much during the same period. This means that young adults are choosing to borrow money together to purchase a home at a greater extent than before.

### HIGHER DEBT-TO-INCOME RATIO IN 2017

The average debt-to-income ratio for households with new mortgages increased between 2011 and 2015. After a weak downturn in 2016, the debt-to-income ratio increased again slightly in 2017. A large percentage of households continued to have high debt in relation to their income.

The average debt-to-income ratio for new mortgagors was 411 per cent based on net income and 300 per cent based on gross income 2017 (Diagram 12). In 2016, the figures were 402 and 296 per cent, respectively. The following diagrams show primarily the debt-to-income ratio based on net income. The diagram appendix to the report contains the same diagrams calculated with gross income.

More households had a high debt-to-income ratio based on net income (Diagram 13). Approximately two out of every five households had a debt-to-income ratio of more than 450 per cent, and almost one out of five had a debt-to-income ratio of more than 600 per cent.

New mortgagors that are single-person households as a rule have a higher debt-to-income ratio than households with more borrowers (Diagram 14). The debt-to-income ratio is also higher for households with higher income. One explanation for this is that households with higher income often live in larger cities, where house prices, and thereby debt, are higher. Another explanation is that high income earners often have more wealth, and thus greater buffers for their personal finances.

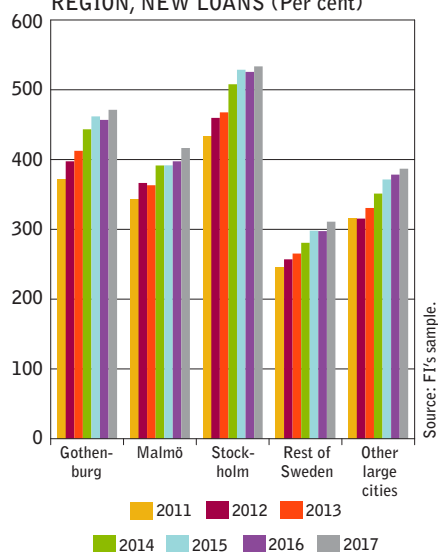
The debt-to-income ratio in the large cities is higher than in other parts of the country (Diagram 15). The highest debt-to-income ratio is in Stockholm. Debt in relation to net income in Stockholm was 534 per cent in 2017. The debt-to-income ratio increased in all regions. The largest increase was in Malmö and Rest of Sweden. The smallest increase was in Stockholm.

The average debt-to-income ratio is highest for borrowers under the age of 50 and lowest for borrowers in higher age groups (Diagram 16). The debt-to-income ratio increased in all age groups except the oldest (65+) in 2017. It increased most among new mortgagors under the age of 30.

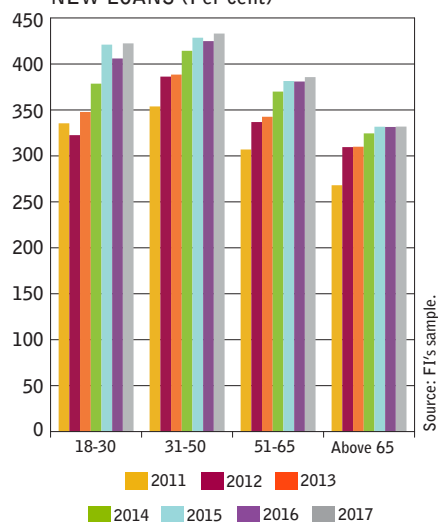
Approximately 15 per cent of the new mortgagors in 2017 had a debt-to-income ratio that was higher than the limit for the stricter amortisation requirement (a loan-to-income ratio of 4.5 times the gross income). This was unchanged compared to in 2016 (Diagram A2.1 in Appendix 2). The percentage is highest among new mortgagors in Stockholm and Gothenburg. In Stockholm, the percentage was 30 per cent of households with new mortgages. This is because house prices and debt in relation to income are highest there. In Rest of Sweden, the corresponding percentage was just under 6 per cent.

The combination of a household's loan-to-value ratio and debt-to-income ratio offer a more complete overview of the household's vulnerability. Households that have both a high debt-to-income ratio and a

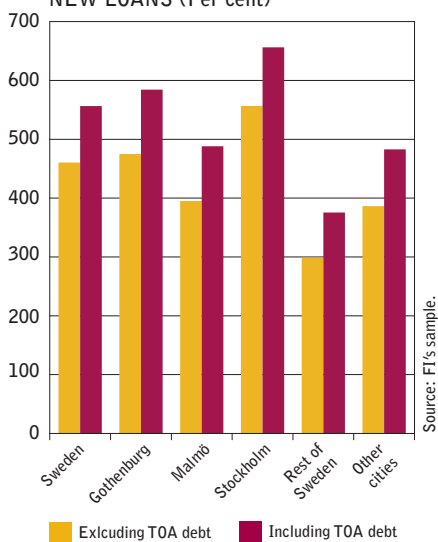
15. DEBT-TO-INCOME RATIO BY REGION, NEW LOANS (Per cent)



16. DEBT-TO-INCOME RATIO BY AGE GROUP, NET INCOME, NEW LOANS (Per cent)



17. DEBT-TO-INCOME RATIO FOR TENANT-OWNERS INCLUDING SHARE OF THE TENANT-OWNER ASSOCIATION'S DEBT, NET INCOME, NEW LOANS (Per cent)



high loan-to-value ratio are most vulnerable. They are vulnerable to both a fall in house prices and a loss of income, but primarily to a combination of the two. The link between households' loan-to-value ratios and debt-to-income ratios is relatively weak. A household with a high loan-to-value ratio does not necessarily have a high debt-to-income ratio or the reverse (Diagram A2.1/A2.2 in Appendix 2).

## DEBT OF TENANT-OWNER ASSOCIATIONS

Lending to tenant-owner associations has increased sharply in recent years.<sup>11</sup> Starting with the 2017 mortgage survey, FI is now gathering information about the tenant-owner association's debt for those who buy a tenant-owned apartment.<sup>12</sup>

The association's debt is an indirect housing liability for owners of the association's tenant-owned apartments. If interest rates rise, the association's interest rate expenses rise, for example. This means that some associations over time may need to raise the fee for their members. The stricter amortisation requirement does not include the association's debt in the calculation of the household's loan-to-income ratio.

The tenant-owner associations' average debt was SEK 5,700 per square meter. The debt was slightly higher in the large cities than in other geographic areas. For newly produced tenant-owner associations in newly formed associations, the average debt was SEK 11,850 per square meter.<sup>13</sup>

Households that bought a tenant-owned apartment in Gothenburg and Stockholm in 2017 on average had a higher debt-to-income ratio than households that bought tenant-owned apartments in other regions (Diagram 17). In Stockholm, this ratio was 560 per cent of net income. When including the debt of the association, the debt-to-income ratio was 660 per cent in Stockholm.

11 In February 2018, lending to tenant-owner associations increased by 9.4 per cent on an annual basis, according to SCB financial market statistics.

12 Six out of eight banks in the mortgage survey stated the tenant-owner association's debt as a debt per square meter for the tenant-owned apartments in the association.

13 Based on data from three banks that specified the tenant-owner association's debt regardless of whether the tenant-owned apartment is a new production or not.

## Household amortisation payments

New mortgagors have increased their amortisation payments over a period of several years. After the amortisation requirement was implemented in 2016, the percentage of new mortgagors who amortise increased sharply. The average amount of the amortisation payment increased as well. Amortisation payments in 2017 were largely at the same level as in 2016. FI makes the assessment that the amortisation requirement has reduced the rate at which the size of new mortgages was increasing.

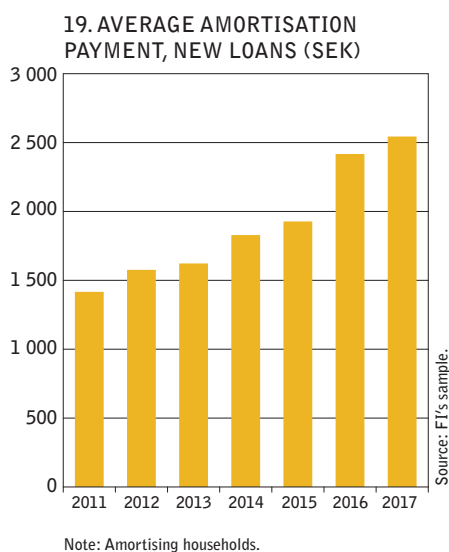
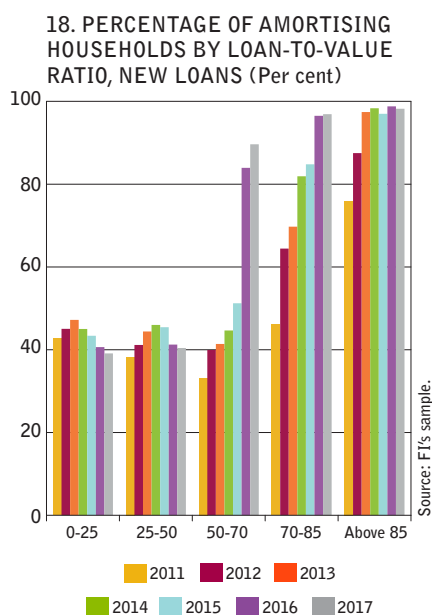
FI introduced an amortisation requirement on 1 June 2016. The aim was to counteract the macroeconomic vulnerabilities facing highly indebted households. The amortisation requirement has resulted in households buying less expensive homes and borrowing less. Amortisation also means that a household reduces its debt over time, and thus also the household's loan-to-value ratio and debt-to-income ratio. The percentage of households that amortise increased as a result of the amortisation requirement. The size of the amortisation payments increased as well. Amortisation payments continued to increase in 2017.<sup>14</sup>

### MANY HOUSEHOLDS WITH HIGH LOAN-TO-VALUE RATIOS AMORTISE

In the 2017 mortgage survey, 79 per cent of households amortise. This was slightly higher than the previous year.<sup>15</sup> Almost all households with a loan-to-value ratio of more than 70 per cent amortised (Diagram 18).<sup>16</sup> Of households with a loan-to-value ratio between 50 and 70 per cent, 90 per cent amortise. However, the percentage of households that amortise is slightly lower among households with a loan-to-value ratio of less than 50 per cent.

The average monthly amortisation amount for households that amortise was slightly higher in 2017 (Diagram 19). This is because more households with a high loan-to-value ratio amortised, but also because the debt was higher. The percentage of households that amortise is approximately the same in all debt-to-income ratio groups (Diagram 20). Approximately 80 per cent of the households with a debt-to-income ratio that exceeds 450 per cent amortise.

Amortisation as a share of the size of the loan has increased since 2012 for households with a loan-to-value ratio above 50 per cent (Dia-

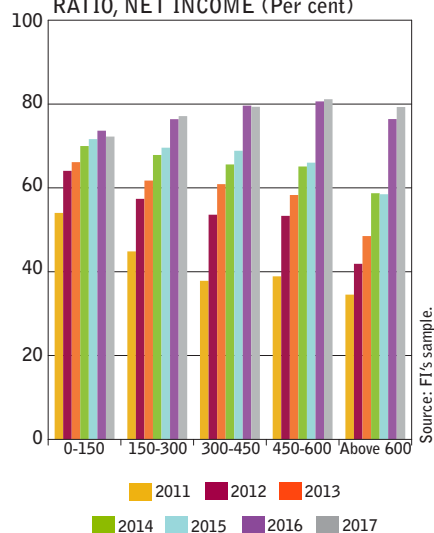


<sup>14</sup> The stricter amortisation requirement had not yet been introduced when the data for this report was gathered.

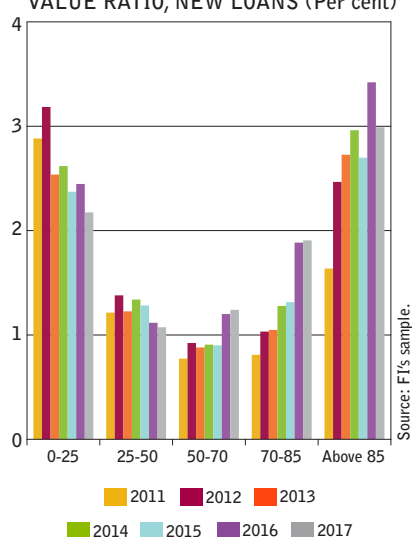
<sup>15</sup> In the mortgage survey, FI has information about how much households plan to amortise each month at the time the loan is granted. However, it is not possible to ensure that this actually happens based on the sample data. Lump-sum payments, i.e. amortisation in excess of the set plan, are not captured by FI's data, either.

<sup>16</sup> There are several possible explanations for why 100 per cent of households with a loan-to-value ratio of more than 50 per cent do not amortise. Households that switch banks for their mortgages are considered new mortgagors in the mortgage survey, but are able to keep their original amortisation terms. Banks also are able to waive the amortisation requirement for households that buy newly produced homes or agriculture property.

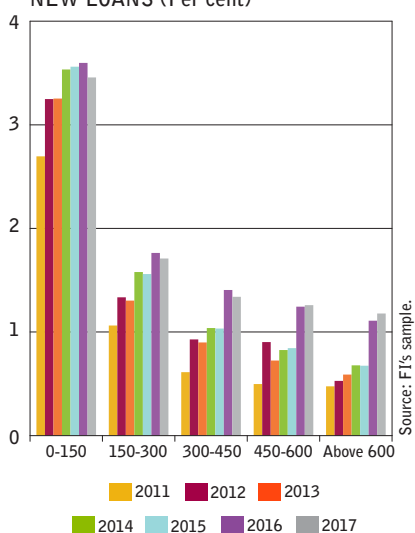
20. PERCENTAGE OF AMORTISING HOUSEHOLDS BY DEBT-TO-INCOME RATIO, NET INCOME (Per cent)



21. AMORTISATION AS A PERCENTAGE OF THE LOAN BY LOAN-TO-VALUE RATIO, NEW LOANS (Per cent)



22. AMORTISATION AS A PERCENTAGE OF THE LOAN BY DEBT-TO-INCOME RATIO, NET INCOME, NEW LOANS (Per cent)



gram 21). The greatest increase was in 2016 when FI introduced the amortisation requirement. At the same time, households with a loan-to-value ratio of less than 50 per cent decreased the size of their amortisation payments in relation to their loan. In 2017, households with a loan-to-value ratio of between 70 and 85 per cent amortised on average 1.9 per cent of the size of the loan.

Amortisation payments in relation to the loan were more or less unchanged compared to 2016 in all debt-to-income categories (Diagram 22). Households in the category with the lowest debt-to-income ratio amortised the most in relation to the size of the loan. Households with new mortgages in 2017 amortised on average 4.7 per cent of their income. This has remained largely the same since 2016.

Younger borrowers with new mortgages amortise more than older borrowers (Diagram 23). This is because younger borrowers often have a higher loan-to-value ratio and a higher debt-to-income ratio. The percentage of young borrowers who amortised in 2017 was 92 per cent. This was a slightly larger percentage than in 2016. Almost half of the new mortgagors aged 65+ amortised in 2017. This pattern was also visible for amortisation as a percentage of income (Diagram 24). Younger borrowers amortise a significantly higher percentage of their income. The percentage that amortised in 2017 increased also for mortgagors under the age of 50.

The aggregate data also contains information about amortisation payments in the total stock of existing mortgages. The amortisation requirement only covers mortgages taken after 1 June 2016. These loans still represent a limited percentage of the total mortgage stock. The amortisation requirement will therefore have a greater influence on the total stock of mortgages over time. In the total mortgage stock, more households amortised in 2017 (Diagram 25). This is in part due to a higher occurrence of amortisation among new mortgagors after FI introduced the amortisation requirement.<sup>17</sup>

Amortisation increased primarily in the groups with a loan-to-value ratio of more than 50 per cent. Among households with a loan-to-value ratio between 50 and 75 per cent, 82 per cent amortised in 2017. This is an increase of around nine percentage points since 2016. In contrast, the percentage of households with a loan-to-value ratio below 50 per cent that amortise decreased. In total, households amortised SEK 36.5 billion of their mortgages during the first three quarters of 2017.<sup>18</sup> The corresponding figures in 2016 was SEK 34.6 billion.

### Amortisation requirement had an impact on household behaviour

Finansinspektionen (2017) finds that new mortgage holders take smaller mortgages than what they would have taken if FI had not implemented the amortisation requirement.<sup>19</sup> They are also buying less expensive homes.

Another year has passed, and FI is therefore updating its assessment with data for 2017 to see if the effects are the same. The effect of the require-

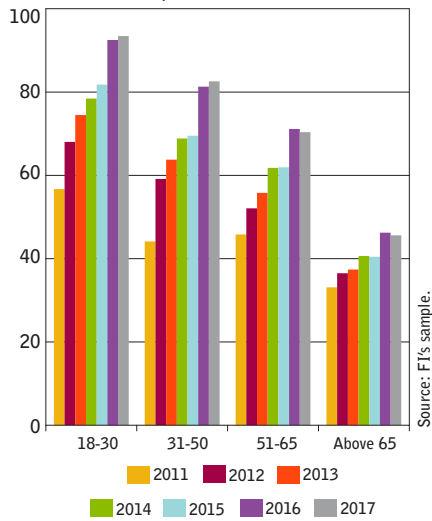
17 It cannot be ruled out that some borrowers may have chosen to increase the amortisation payments on their existing loans.

18 These figures come from the aggregate data in the mortgage survey.

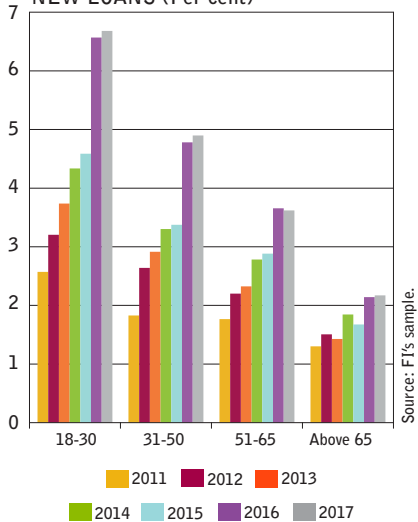
19 Finansinspektionen (2017), "Amortisation requirement reduced household debt", FI Analysis 10.



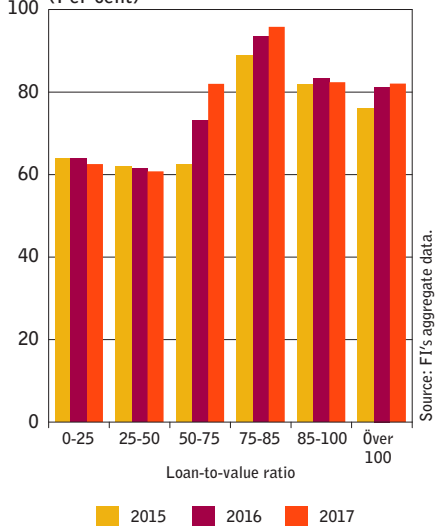
23. AMORTISING HOUSEHOLDS BY AGE GROUP, NEW LOANS (Per cent)



24. AMORTISATION PAYMENTS AS A PERCENTAGE OF INCOME BY AGE, NEW LOANS (Per cent)

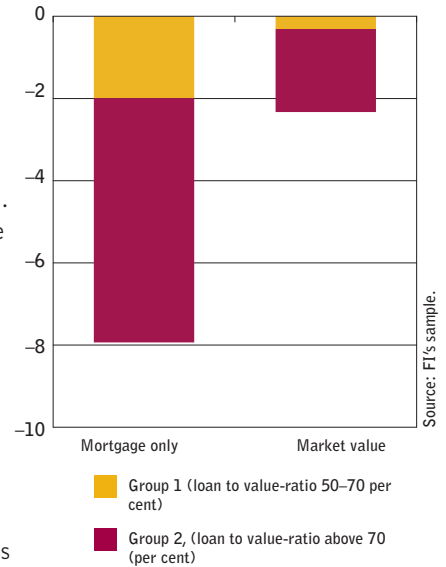


25. PERCENTAGE OF AMORTISING HOUSEHOLDS, EXISTING LOANS (Per cent)



ment is measured by estimating what the outcome would have been without the requirement. FI therefore divides households into groups. Households with a loan-to-value ratio between 50 and 70 per cent, which according to the requirement must amortise at least 1 per cent of the loan every year, are Group 1. Households with a loan-to-value ratio of more than 70 per cent are Group 2. These households must amortise at least 2 per cent of their loan every year. Group 3 is a control group to compare the first two groups. The control group consists of households that are not subject to the requirement since they have a loan-to-value ratio of less than 50 per cent.<sup>20</sup>

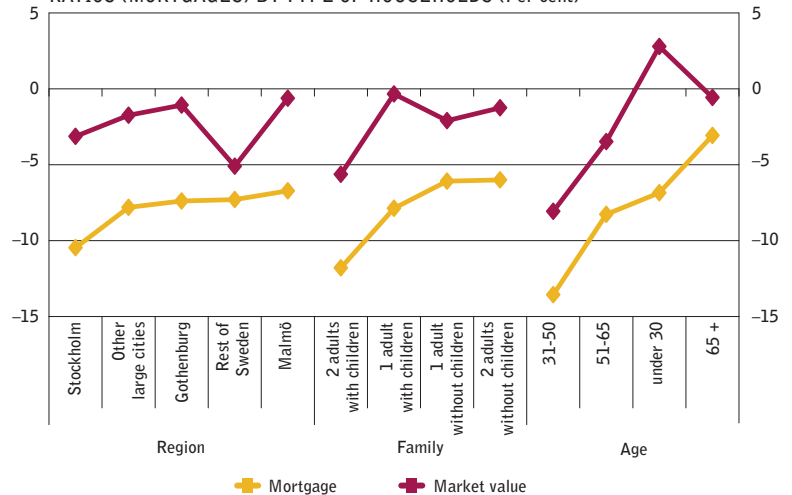
B 2.1. EFFECTS OF THE AMORTISATION REQUIREMENT ON MORTGAGES AND MARKET VALUES OF HOUSING (Per cent)



The updated analysis mainly confirms previous results. The amortisation requirement has reduced the rate of growth of new mortgages and resulted in households buying less expensive homes. The effect is greatest for the households that must amortise at least 2 per cent a year (Diagram B2.1). The amortisation requirement reduced the growth rate of debt more than the growth rate of house prices. This may be because households are more likely than before to use financial savings for their cash deposit or finance their purchase in some other way than solely through a mortgage. As a whole, the amortisation requirement slowed the growth of house prices by 2 per cent and debt-to-income ratios by almost 8 per cent.

Homebuyers in Stockholm and families with children reduced their mortgages the most as a result of the amortisation requirement (Diagram B2.2). In addition, households between 31 and 65 were affected the most. New mortgagors in the youngest age groups are borrowing less, but the amortisation requirement has not caused them to buy less expensive homes.

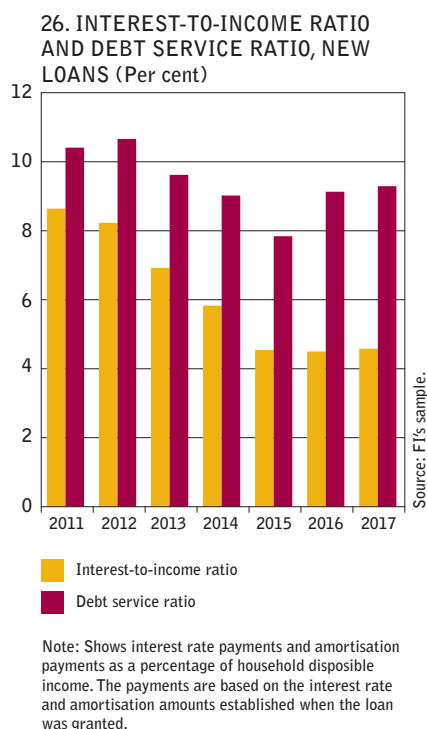
B 2.2. EFFECTS OF THE AMORTISATION REQUIREMENT ON DEBT-TO-INCOME RATIOS (MORTGAGES) BY TYPE OF HOUSEHOLDS (Per cent)



<sup>20</sup> The method is described in more detail in Finansinspektionen (2017), “Amortisation requirement reduced household debt”, FI Analysis 10.

## Households' payment ability

Both banks and FI assess mortgagors' payment ability. FI's calculations and stress tests show that their payment ability is continuing to improve. As a whole, FI makes the assessment that the risk of the banks experiencing widespread credit losses as a result of mortgages is limited.



In a scenario with an economic downturn, the margin between income and expenses shrinks for many households. FI's stress tests show how many households with new mortgages would experience a budget deficit in a stressed scenario. If many households were to experience a deficit at the same time, in the long run this could lead to credit losses at the banks. A deficit in FI's calculations does not necessarily mean credit losses for the banks. A household may be granted temporary reprieve from amortisation payments, use savings or choose to consume at a level below the Swedish Consumer Agency's guidelines for a period of time. It is also possible that a household that does not experience a deficit may be forced to reduce consumption. Reduced consumption has a negative impact on macroeconomic growth. The stress tests in this report do not capture a reduction in the households' consumption.

A household's debt burden can be measured by how much of its disposable income it uses to pay its loans. The interest-to-income ratio measures interest rate payments in relation to income. The debt service ratio also includes amortisation payments. The average interest-to-income ratio for new mortgagors fell until 2015, after which it has remained stable (Diagram 26). Household with new mortgages allocated on average 4.5 per cent of their disposable income to interest rate payments in 2017. The debt service ratio also decreased until 2015. After 2015, it has been increasing as a result of the increase in amortisation payments. The average new mortgagor allocated more than 9 per cent of its income to interest rate and amortisation payments in 2017.

### BANKS' ASSESSMENT OF HOUSEHOLDS PAYMENT ABILITY

Before banks grant a mortgage, they conduct a detailed assessment of a household's economic situation and repayment ability via a discretionary income calculation. These calculations play a key role in the banks' risk management and, by extension, for financial and macroeconomic stability. They also provide good consumer protection. FI therefore reviews the banks' methods.

When a household applies for a mortgage, it provides information about income and debt. As part of its discretionary income calculation, a bank deducts estimated expenses from household income. The expenses consist of taxes, operating expenses related to the home, interest rate expenses (using a rate that is higher than the actual rate) and amortisation payments. The banks also make deductions for subsistence costs. In order for the banks to grant a mortgage, the household normally may not have a deficit. The banks may grant an exception if the households has other large assets or additional income that has not been included in the calculation. Other grounds for the excep-



tion could be a low loan-to-value ratio or that parts of the loan consist of a temporary bridging loan.<sup>21</sup>

The average standardised cost for one adult was SEK 8,600/month in this year's mortgage survey. Since 2016, all banks in the survey include the amortisation requirement in their discretionary income calculations. The average interest rate used in the banks' calculations was approximately 7 per cent in 2017. This can be compared to the average actual mortgage rate in the sample, which was 1.65 per cent.

### FI'S ASSESSMENT OF HOUSEHOLD PAYMENT ABILITY

FI conducts its own calculations of the households' monthly surpluses.<sup>22</sup> In its calculations, FI uses the interest rate that applied at the time the loan is granted and not the higher rate of interest. Hence, FI's calculations are not directly comparable to those of the banks. Household resilience to rising interest rates is analysed through stress tests. In some cases, it is interesting to look at the effect of amortisation. FI therefore calculates the monthly surpluses both with and without actual amortisation payments.

Different banks use different standard costs and discretionary income interest rates. FI's stress tests treat all households equally and therefore uses the average of the banks' standardised costs and discretionary income interest rates.<sup>23</sup> Standardised costs are based on the size of the household, the household composition and the type of the home. Standardised costs do not refer to households' actual expenses at the time the loan is granted, but rather the basic costs the household cannot avoid if it were to experience financial difficulty. FI's stress tests therefore do not capture households that may be forced to reduce their consumption to be able to continue to pay off their loans. FI calculates household disposable income by deducting tax from income before tax.<sup>24</sup> Child benefits, if applicable, are then added.

The banks' standardised costs have increased over time, but they fell between 2015 and 2016. In its assessment of household resilience, FI

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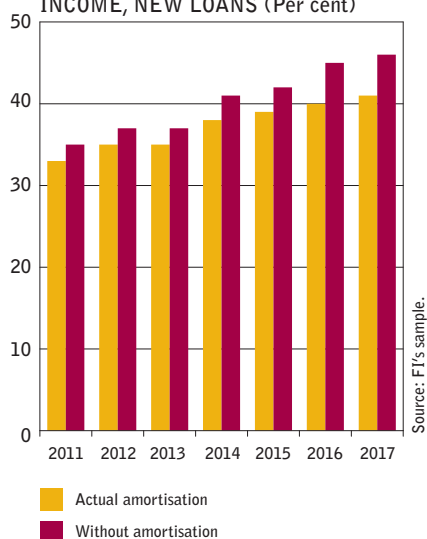
21 A bridging loan is a temporary loan granted for the period between when the household has paid for a new mortgage but not yet received payment for the old apartment that the household has or intends to sell.

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

23 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 household's home. Because FI does not have access to sufficiently detailed information about the households' homes, 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 take into consideration in their assessment of a household's payment ability the financial assets of the household. Because FI lacks such information, this is not possible in FI's analysis. The banks' methods for determining households' ability to pay vary between banks. The use of a standardised calculation for all banks enables consistent comparisons between the banks.

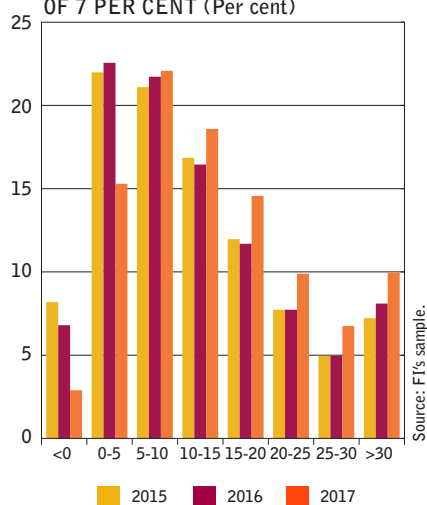
24 The tax is calculated in accordance with a pre-determined schedule. According to the tax schedule, income less than SEK 5,400 per month is not taxed, income between SEK 5,400 and 37,500 is taxed at 30 per cent of the gross amount, income between 37,500 and 53,750 is taxed at 50 per cent and income above 53,750 at 60 per cent.

27. MONTHLY SURPLUS AS A PERCENTAGE OF DISPOSABLE INCOME, NEW LOANS (Per cent)



Note: Monthly surplus is defined by disposable income minus housing and living costs.

28. DISTRIBUTION OF HOUSEHOLDS IN INTERVALS BY MONTHLY SURPLUS (SEK THOUSANDS) AT AN INTEREST RATE OF 7 PER CENT (Per cent)



Note: The monthly surplus was calculated given actual amortisation payments. An interest rate of 7 per cent is roughly five percentage points higher than the average for the period 2015-2017. It is also approximately the interest rate used in the banks' credit assessments.

has chosen to use the subsistence costs for 2015.<sup>25</sup> Costs for previous and later years were calculated using the Consumer Price Index with a fixed interest rate (CPIF). The reason that FI has chosen CPIF is to avoid counting interest expense twice.<sup>26</sup> FI uses standardised costs for 2017 of SEK 9,500/month for one adult and SEK 23,500/month for a family of two adults and two children.<sup>27</sup>

HOUSEHOLD MARGINS ARE SOUND

The financial margins of households are sound in general. According to FI's calculations, households in the sample have on average a surplus of SEK 20,000 per month.<sup>28</sup> This corresponds to 41 per cent of their disposable income. The surplus in relation to income among new mortgagors has increased every year since 2011 (Diagram 27). One reason is that the interest rates that new mortgagors are paying on their loans have fallen, but the margins also improved between 2015 and 2017 even though the interest rate has largely remained unchanged. The increase in the surplus since 2015 is therefore due to reasons other than the interest rate. The income of new mortgagors has been higher than the income of last year's mortgagors.

Almost 9 per cent of households with new mortgages had less than SEK 5,000 left over every month, given their actual interest rate and amortisation payments. This is about three percentage points fewer than in 2016. The percentage of households with new mortgages with a deficit at the time the mortgage was granted was less than 1 per cent in 2017. This can be compared to 1.3 per cent in 2016 and 2.2 per cent in 2015. Using a higher discretionary income interest rate, 18 per cent of the households had less than SEK 5,000 left over every month (Diagram 28). This is a significantly smaller share than in 2016. Then, almost one-third of the households had less than SEK 5,000 left over every month.

As in previous years, the youngest (up to 30) and oldest (65+) new mortgagors had the lowest average monthly surpluses (Diagram 29). This is because these mortgagors often have lower income and are more likely to be single-person households compared to the mortgagors in other categories. The surplus increased the most for the youngest borrowers compared to in 2016. In FI's discretionary income calculations, 6 per cent of the oldest borrowers had a deficit in 2017. The corresponding figure for the other age groups was around 1 per cent. The percentage with a deficit decreased for all groups.

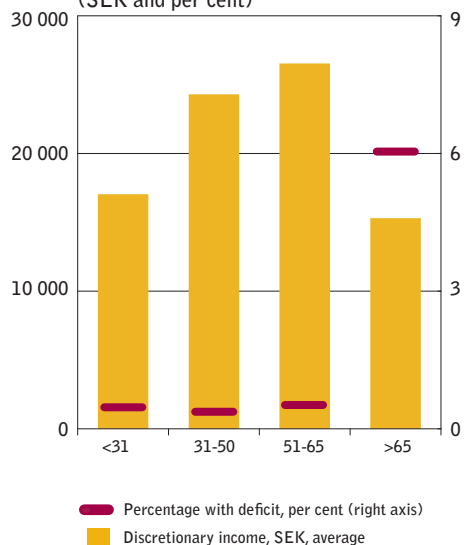
25 In order to take a cautious approach to its calculation, FI has chosen 2015 as the base year for the standardised costs.

26 The calculation only applies to subsistence costs. The cost for the home is calculated as the average of the banks' standardised costs.

27 The Swedish Consumer Agency's benchmarks for 2017 were between SEK 6,940 and SEK 18,130 for each household size. 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 society, irrespective of the household's income. It represents neither a subsistence minimum nor excessive consumption, but rather a reasonable standard of consumption. Costs for, for example, pre-school are not included. For further information see Swedish Consumer Agency Report 2013:4 (Swedish only): "Konsumentverkets beräkningar av referensvärden".

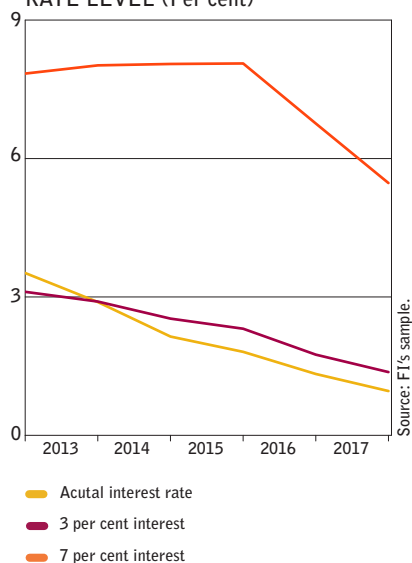
28 The calculation is based on the banks' average standardised costs using the actual interest rate and the actual amortisation schedule.

29. MONTHLY SURPLUS BY AGE GROUP, WITHOUT AMORTISATION (SEK and per cent)



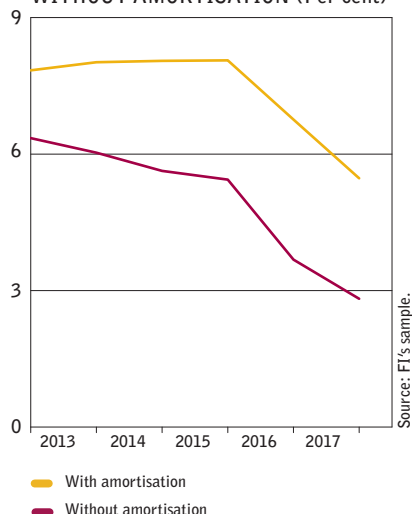
Source: FI's sample.

30. PERCENTAGE OF HOUSEHOLDS WITH A DEFICIT BY INTEREST RATE LEVEL (Per cent)



Source: FI's sample.

31. PERCENTAGE OF HOUSEHOLDS WITH A DEFICIT AT AN INTEREST RATE OF 7 PER CENT WITH AND WITHOUT AMORTISATION (Per cent)



Source: FI's sample.

## STRESS TESTS INDICATE HEALTHY MARGINS

FI conducts stress tests to evaluate households' resilience to a deterioration in their financial circumstances. In the stress tests, FI estimates how the households' payment ability is affected by rising interest rates, unemployment, or a drop in the value of the home. Interest rate increases and unemployment result in the households having less discretionary income, while a drop in house prices leads to an increase in the households' loan-to-value ratio. FI has analysed five possible negative scenarios:

- Interest rate sensitivity.
- Unemployment.
- Interest rate sensitivity where even the tenant-owner associations' debt can affect the debt servicing of tenant-owners.
- A combination of interest rate sensitivity and a drop in house prices.
- A combination of unemployment and a drop in house prices.

The three first scenarios calculate the percentage of households that have a deficit in their monthly budget. The last two calculate the percentage of households that both have a deficit and a loan-to-value ratio of more than 100 per cent (i.e. negative equity, the loan is larger than the value of the home). In the stress tests for the first two scenarios, FI compares the percentage of households with new mortgages that have a deficit during the period 2011–2017.

The third scenario also considers the debt of tenant-owner associations. If the interest rate increases for the tenant-owner association, this may mean that the association will need to raise its fees.<sup>29</sup> FI also assumed in the stress test that the fee covers the association's interest rate expenses at the outset. When the interest rate increases, the association's increased interest rate payments will result in a corresponding increase in the monthly rent.<sup>30</sup>

Two banks state in the mortgage survey that in their credit assessment they always stress the fee to the association through an increase in the interest rate. Four banks stress the fee only if the association's debt exceeds a certain benchmark. A benchmark used is that the association's debt should not be larger than 9,000–10,000 SEK/m<sup>2</sup>.

The stress tests only estimate how households are expected to meet their payments. The fact that a household has a deficit in the stress tests does not necessarily mean that it would have difficulties paying its loan instalments if a similar scenario were to happen in reality. The household may have savings it can use for subsistence costs. The persons in the household may also choose to live below the consumption standard for a certain period of time.

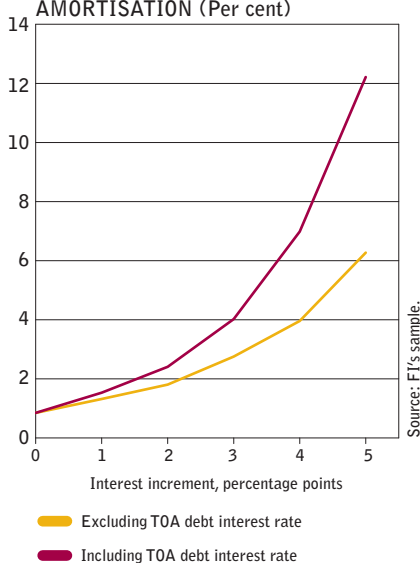
### Interest rate sensitivity

The fact that households have buffers in their finances helps them handle higher interest rate expenses. They can also protect themselves

29 This stress test is possible since FI began to gather data in 2017 about tenant-owned apartments' area and the associations' debt per square meter.

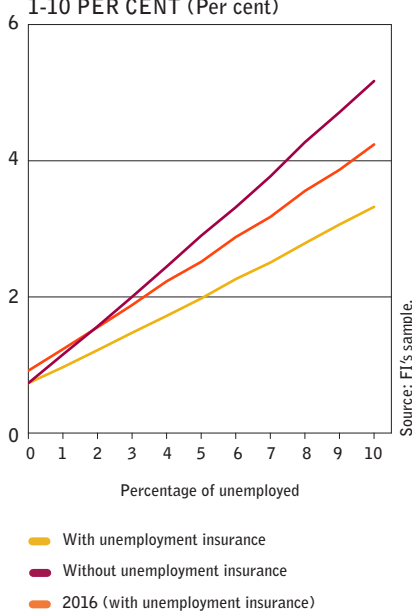
30 The assumption that interest rate increases have a direct effect on monthly rent is conservative. It is probable that many associations will not need to increase rent following small increases in the interest rate.

**32. PERCENTAGE OF TENANT-OWNERS WITH A DEFICIT AT HIGHER INTEREST RATES WHEN THE ASSOCIATION'S DEBT IS INCLUDED, WITHOUT AMORTISATION (Per cent)**



Note: FI has assumed that the association fee covers the association's current interest expenses. The cost of a higher interest rate is assumed to be transferred in full to the association's members. The calculation is based on actual amortisation payments.

**33. PERCENTAGE OF HOUSEHOLDS WITH A DEFICIT GIVEN AN INCREASE IN UNEMPLOYMENT OF 1-10 PER CENT (Per cent)**



against higher interest rates by fixing their mortgage rate. FI's sample in 2017 showed that 30 per cent of households had an average interest rate adjustment period of more than one year. This was eight percentage points more than the previous year.

FI calculates households' sensitivity to interest rates by increasing the mortgage rate to see how many households would have a deficit in their monthly budget given FI's standardised costs. The interest rate expenses in the stress test are calculated using the households' total loans, and not just mortgages, since other interest rates increase at the same time as the mortgage interest rates. The stress test also affects fixed interest rates. This means that the households' interest rate sensitivity will be overestimated in the short-term, but over time fixed interest rates will also be affected by the interest rate increment. In a normal economy, households pay their interest rate payments and amortisation payments. This is why amortisation payments are included in our calculations. The analysis is supplemented with a scenario where temporary reprieve from the amortisation payments is granted.

The percentage of households with new mortgages that have a deficit given a certain interest rate has decreased over time (Diagram 30). If the interest rate increases from the actual level to 7 per cent, the percentage with a deficit increases from 1 per cent in 2017 to 5.5 per cent. The debt of these households represents almost 5 per cent of the total lending volume. The share of households with a deficit increases the most in the age group 65+. It is also in this group where the percentage with a deficit is highest at the outset. There is also an over-representation of households with a high debt-to-income ratio among those that have a deficit given an interest rate of 7 per cent. This is natural since the debt-to-income ratio demonstrates a sensitivity to interest rates.

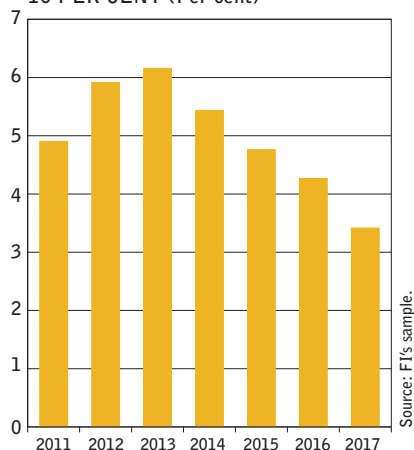
Since 2015, the percentage of households with small margins has decreased even though households with new mortgages on average are borrowing more in relation to their income. Given an interest rate of 3 per cent, the percentage of households with a deficit has gradually decreased since 2012. Improved margins indicate that households are more resilient to increases in the interest rate.

During periods of extreme financial stress, a household can receive a temporary reprieve from the amortisation requirement. This means that their monthly payment may decrease temporarily. Such a reprieve would mean that the percentage of households with new mortgages that show a deficit at an interest rate of 7 per cent decreases by almost three percentage points (Diagram 31). The difference between the percentage of households that have a deficit with and without amortisation has increased over time. This is because the banks include amortisation payments when they calculate the households' monthly surplus in the credit assessment.

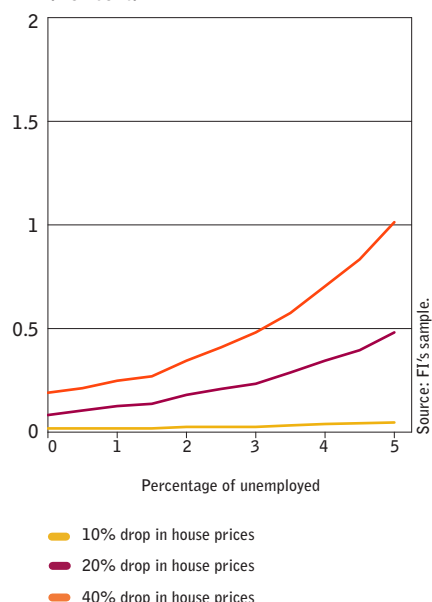
A tenant-owner association's debt affects households that live in a tenant-owned apartment. When the interest rate increases for the association, it may be necessary to raise the association fees. If the interest rate increases by five percentage points<sup>31</sup>, just over 6 per cent of the tenant-owners will have a deficit in FI's calculations (Diagram 32). If the entire increase in the association's interest rate payments is transferred

31 An interest rate increment of 5 per cent corresponds on average to an interest rate of 6.7 per cent. This means that the results are not fully comparable to estimated interest rate sensitivity for all new mortgagors.

34. PERCENTAGE OF HOUSEHOLDS WITH A DEFICIT AT AN INCREASE IN THE UNEMPLOYMENT RATE OF 10 PER CENT (Per cent)



35. HIGHER INTEREST RATE AND A DROP IN HOUSE PRICES: PERCENTAGE OF HOUSEHOLDS WITH A DEFICIT AND NEGATIVE EQUITY (Per cent)



to the tenant-owners, the percentage with a deficit will increase to more than 12 per cent.<sup>32</sup>

### Unemployment

Unemployment lowers household income. This means that the financial situation of affected households would deteriorate. Households that do not have unemployment insurance would be hit particularly hard. FI analyses households' ability to meet interest rate payments and other expenses if unemployment were to increase. The risk that households in the sample would become unemployed is probably lower than for households in society at large. Banks require the household to have their financial circumstances in order to be approved for a mortgage. The increase in unemployment in the stress test can therefore not be related to a certain increase in unemployment for Sweden as a whole.

The stress test is a simulation where a percentage of the new mortgagors under the age of 67 are randomly assumed to have become unemployed. Their income is then lowered. The households' new income is then used for a new calculation of the monthly budget. The actual interest rate is used in the calculation. Furthermore, FI assumes that households receive a reprieve in making amortisation payments. FI conducts two calculations. The first assumes that two-thirds of households are connected to an unemployment insurance; the remaining one-third is assumed not to have unemployment insurance. FI then investigates how many households will have a deficit.

Diagram 33 shows that almost 3.3 per cent of households in 2017 have a deficit in their monthly budget calculation if 10 per cent of the borrowers became unemployed. If none of the borrowers have unemployment insurance, the percentage with a deficit would be around 4.2 percentage points higher. The percentage of households with a deficit in the same categories was one percentage point higher last year. Fewer households have had small margins since 2013 (Diagram 34). This confirms the assessment that household resilience has increased.

### Decline in house prices combined with higher stress

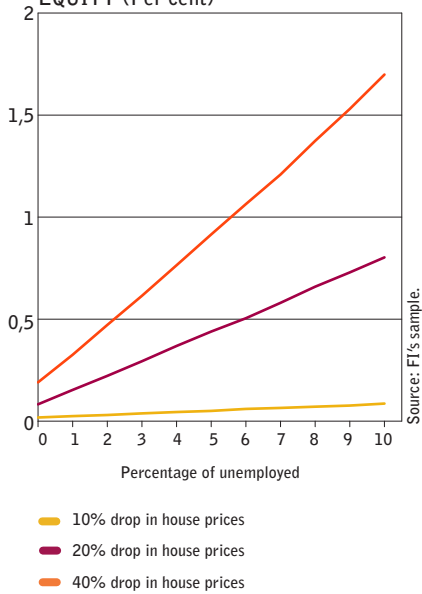
FI also combines interest rate increments or higher unemployment with a drop in house prices. The analysis shows the percentage of households with a debt after they have sold their home due to a deterioration in their payment ability. Households in practice can adapt in ways other than by selling their homes if their situation changes. For example, they could lower their consumption if this is possible.

Assume that the interest rate increases by five percentage points at the same time that house prices fall by 40 per cent.<sup>33</sup> Around 1 per cent of the new mortgagors would then have a deficit and negative equity (Diagram 35). This is fewer than in 2016. Assume instead that house prices fall by 40 per cent and 10 per cent of the households with new mortgages become unemployed. Then, 1.7 per cent of households would experience a deficit and negative equity (Diagram 36). In 2015 and 2016, the corresponding figures were 2.5 and 2.1 per cent.

32 Tenant-owner associations often have fixed interest rates. This means that it will take longer for interest rate increases to have a full impact on the associations.

33 The calculations refer to the given disruption. If other disruptions occur, the results will change. Such a scenario is not analysed in this report.

**36. HIGHER UNEMPLOYMENT AND A DROP IN HOUSE PRICES: PERCENTAGE OF HOUSEHOLDS WITH A DEFICIT AND NEGATIVE EQUITY (Per cent)**



**Household resilience has improved**

In total, FI's stress tests show that household resilience has improved since 2013. Currently, most of the households with new mortgages have sufficient buffers to handle higher interest rates, higher unemployment and a fall in house prices. Even in the event of severe stress, few households experience problems with their payments.

Resilience has improved in particular since 2015. One probable cause for this is that the banks have included amortisation payments in their discretionary income calculations since the amortisation requirement entered into force. The fact that amortisation payments can be paused if necessary improves the resilience of households.



## Appendix 1 – FI’s monthly calculation

The banks’ discretionary income calculation contains detailed information about mortgage holders’ household-specific information that is registered when applying for a loan. This includes actual tenant-owner apartment charges and operating costs for the individual household. In the absence of information, the banks use standardised costs that are dependent on the household size and composition and the type of the home. FI’s monthly calculation uses 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, for example for heating, FI’s calculations are not as precise for individual households as those of the banks.

TABLE A1. FI’s standardised costs in the monthly calculation (SEK)

|                        | 2017   | 2016   | Swedish Consumer Agency 2017 |
|------------------------|--------|--------|------------------------------|
| Subsistence costs      |        |        |                              |
| 1 adult                | 9,500  | 9,300  | 6,350                        |
| 2 adults               | 16,400 | 16,100 | 11,090                       |
| per child              | 3,500  | 3,500  | 2,930                        |
| Operating expenses     |        |        |                              |
| Single-family dwelling | 3,800  | 4,000  |                              |
| Tenant-owned apartment | 3,100  | 3,100  |                              |
| Holiday home           | 1,900  | 2,100  |                              |

The standardised costs in the table are extrapolated by an average of the standardised costs stated by the banks for 2015. This extrapolation uses CPIF. To the right are the standardised costs for 2016 that were used in the report for 2016. The stress tests for 2011-2014 are based on a backward extrapolation of the costs from 2015, even then with CPIF and the Swedish Consumer Agency’s estimates of costs to achieve a reasonable consumption standard.

### The thresholds for the income deciles are:

| Single-person households: | Households with more than one borrower: |
|---------------------------|---|
| 1: >SEK 18,700,           | 1: >SEK 36,200,                         |
| 2: >SEK 20,500,           | 2: >SEK 40,400,                         |
| 3: >SEK 22,600,           | 3: >SEK 43,900,                         |
| 4: >SEK 24,000,           | 4: >SEK 46,900,                         |
| 5: >SEK 25,900,           | 5: >SEK 50,100,                         |
| 6: >SEK 27,700,           | 6: >SEK 53,700,                         |
| 7: >SEK 29,600,           | 7: >SEK 57,800,                         |
| 8: >SEK 32,600,           | 8: >SEK 62,700,                         |
| 9: >SEK 38,500            | 9: >SEK 71,700                          |
| 10: >SEK 2,181,200.       | 10: >SEK 1,141,000.                     |

## Appendix 2 – Households with new mortgages

### Relationship between loan-to-value ratio and debt-to-income ratio, relationship between loan and interest rate level

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

FIGURE A2.1. Sample 2017: Relationship between loan-to-value ratio and debt-to-income ratio, net income, new loans

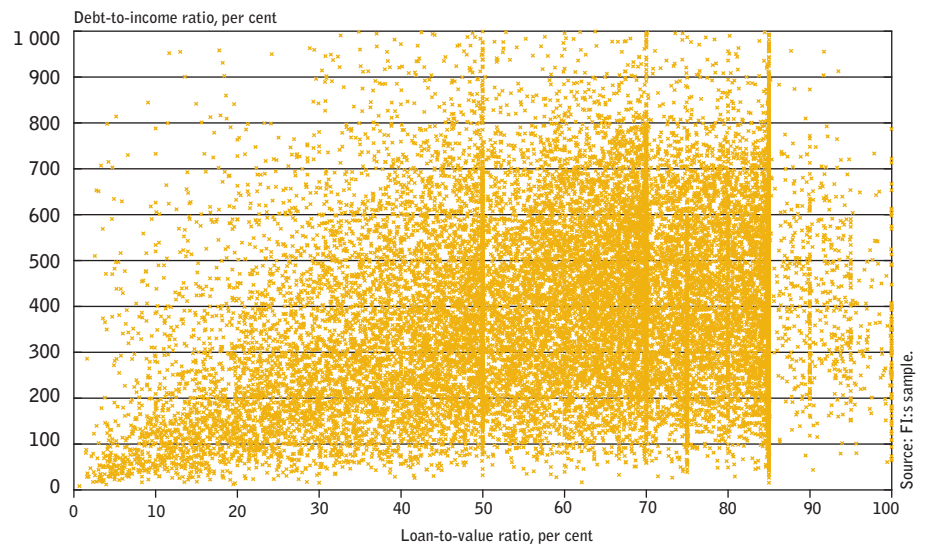


FIGURE A2.2. Sample 2017: Relationship between loan-to-value ratio and debt-to-income ratio, gross income, new loans

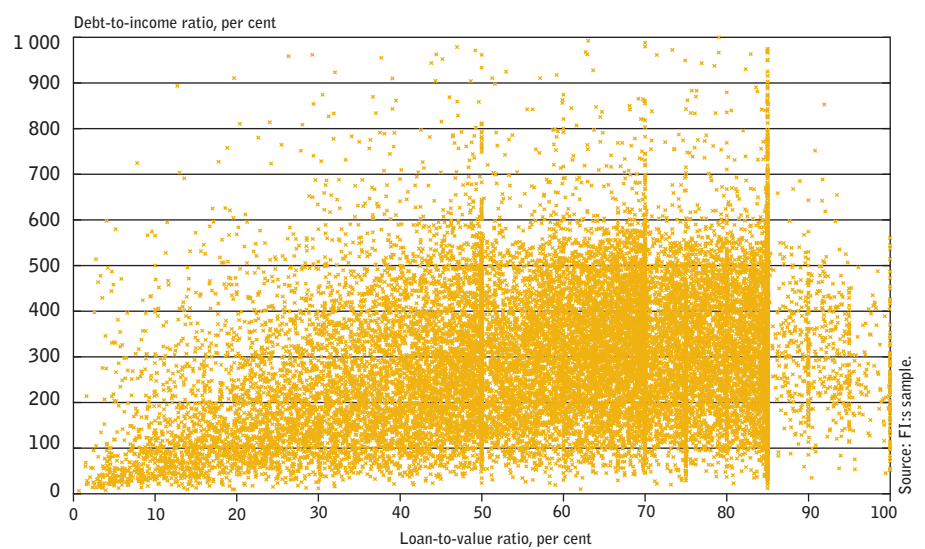
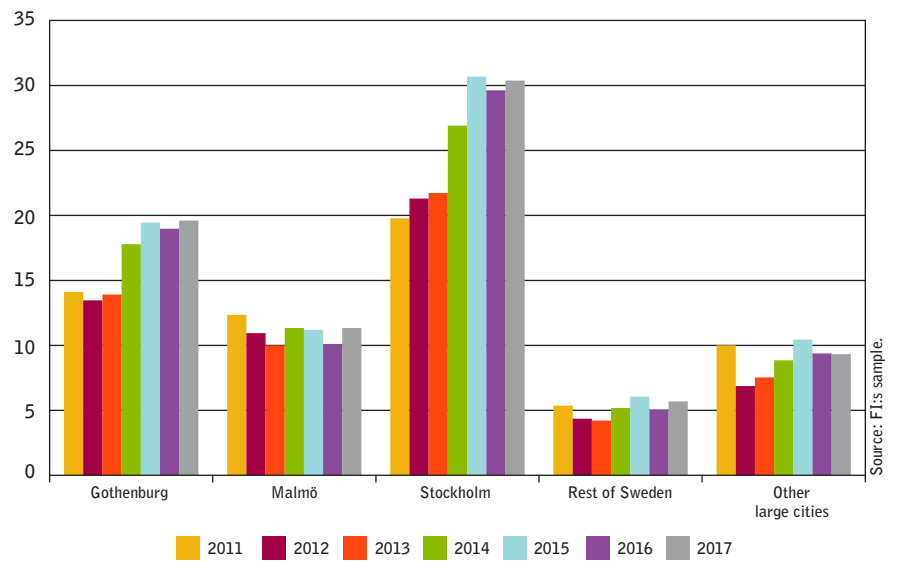




DIAGRAM A2.3. Percentage of households by region with debt larger than 4.5 times their gross income, new loans (per cent)





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