



FINANSINSPEKTIONEN

The Swedish Mortgage Market

27 March 2019



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Summary

Finansinspektionen's (FI) assignment is to contribute to a stable financial system through well-functioning markets and strong consumer protection. As part of this assignment, FI is following the ongoing development of household debt. High debt can mean risks for individual households, banks, financial stability and macroeconomic development. The mortgage survey provides an important basis for the assessment of the risks associated with household debt.

Household debt has been rising faster than disposable income for a long time. One important reason for this is that house prices have been rising rapidly. To mitigate the risks associated with household debt, FI has implemented a number of measures to increase the resilience of households. In order to further strengthen the resilience of households, FI introduced a stricter amortisation requirement as of 1 March 2018.

The increase in the average loan-to-income ratio slowed in the 2018 survey. The percentage of borrowers that have a high loan-to-income ratio also decreased. This report shows that the stricter amortisation requirement contributed to this development. New mortgagors that were subject to the stricter amortisation requirement borrowed less and purchased less expensive homes than what they would have done without the requirement. However, the average loan-to-value ratio of new mortgagors increased in the 2018 survey after having decreased for several years. The percentage of new mortgagors with a high level of debt in relation to their income or the value of their home continues to be high.

The percentage of households that amortise their mortgages has also increased over a period of several years partly due to the stricter amortisation requirement. The size of the amortisation payments increased as well, and more new borrowers with a high loan-to-income ratio amortised in the 2018 survey.

In the stress tests FI conducted, larger amortisation payments resulted in more households experiencing a deficit between income and expenses when unemployed. More households were able to pay higher interest rates without experiencing a deficit. In general, households with new mortgages are still able to make their payments on their mortgages by a strong margin. Households' ability to handle rising interest rates and unemployment therefore continues to be considered stable.

The good resilience of households indicates that there is a limited risk that mortgages would cause extensive credit losses for banks. However, households could be expected to reduce their consumption if their financial circumstances were to deteriorate. This applies in particular to households with a high level of debt in relation to their income or the value of their home. A decrease in consumption could have a negative impact on economic growth.

Background and purpose

The debt of Swedish households has increased rapidly for a long time. In January 2019, debt amounted to SEK 4,025 billion, which corresponds to approximately 85 per cent of Sweden's GDP. Mortgages represented 82 per cent of total household debt. The mortgage survey provides an important basis for FI's analysis of household debt and the associated risks for households, banks, and, by extension, macroeconomic growth and financial stability. This report presents the results from the 2018 mortgage survey.

The purchase of a home is in many cases the largest investment a household will make. In order to be able to finance their home, households generally need to take out a mortgage. A well-functioning credit market is important for making it possible for households to redistribute their consumption to different periods in life. High debt can lead to risks for individual households, banks, financial stability and the economy as a whole. Household debt has increased rapidly the past 20 years. The growth rate of debt slowed in the 2018 survey, but this rate continues to be high. One important reason for the higher debt has been rising house prices. Despite a slow-down in recent years, house prices have risen sharply for a long time. This increase in prices is due to several factors. Stable income growth and a growing population has increased demand for homes. In the past five years, historically low interest rates decreased the cost of owning a home, which boosted demand further. Changes in the housing market's structure also contributed to greater demand for mortgages, including an increase in the construction of tenant-owned apartments and conversions of rental apartments into tenant-owned apartments.

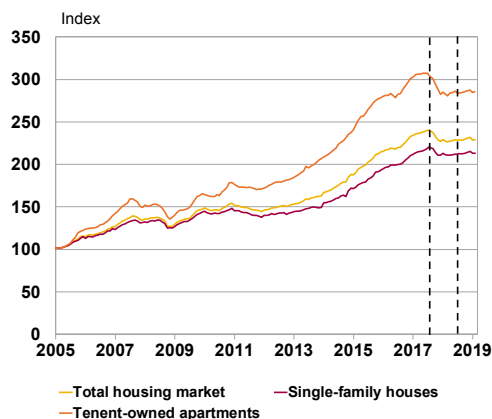
FI has taken measures over time to reduce the vulnerabilities associated with high household debt and strengthen the resilience of both households and banks.¹ In 2010, FI introduced a mortgage cap.² FI also introduced shortly thereafter a risk weight floor for mortgages, which requires banks to hold more equity for their mortgages. In 2016, FI introduced an amortisation requirement that required households borrowing more than 50 per cent of their home's value to amortise at least 1 per cent of their mortgage a year and households borrowing more than 70 per cent to amortise at least 2 per cent.³ On 1 March 2018, FI introduced a stricter amortisation requirement following approval from the Government (see "A stricter amortisation requirement based on households' gross income and total collateralised mortgages", page 11, and "Evaluation of the stricter amortisation requirement", page 13).

1 See Finansinspektionen's *Stability in the Financial System 2018:2* for a more in-depth discussion on the vulnerabilities facing households.

2 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.

3 FFFS 2016:16. See FI Analysis 10, *Amortisation requirement reduced household debt* for an evaluation of the first amortisation requirement.

1. Aggregate house prices

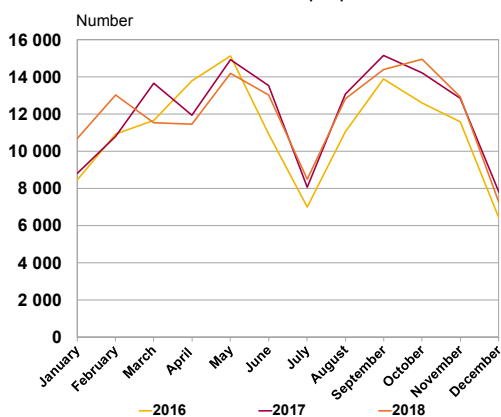


Source: Valueguard.

Note: Index 100=2005-01-01. Seasonally adjusted prices.

Vertical dotted lines refer to when the 2017 and 2018 mortgage surveys, respectively, were conducted.

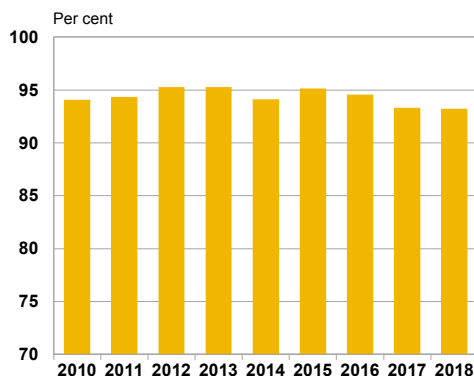
2. Number of residential properties sold



Source: Valueguard.

Note: Number of single-family homes and tenant-owned apartments sold per month for the existing supply of residential properties.

3. Market share for banks included in the mortgage survey, total mortgages



Source: Mortgage survey, aggregate data and SCB.

Note: The total outstanding mortgages for banks included in the mortgage survey as a percentage of MFI's total outstanding mortgages.

HOUSE PRICES LOWER THAN IN THE LAST SURVEY

The 2018 mortgage survey is unique in that it marks the first FI survey where house prices are lower than they were in the previous year. During the second half of 2017, growth in house prices slowed relatively quickly. Between the 2017 and 2018 mortgage surveys, house prices fell by 3.6 percent according to aggregate price statistics (Diagram 1). One of the explanations for the price correction was a high rate of construction of tenant-owned apartments, which increased the number of new tenant-owned apartments for sale. This contributed to a noticeably greater supply of homes at the end of 2017. The stricter amortisation requirement is also considered to have slowed price growth to some extent.⁴ The number of homes sold from the existing supply in 2018 was the same as those sold in 2017 (Diagram 2). In Q3 2018, which was when the mortgage survey was conducted, approximately 1 per cent fewer homes were sold compared to in Q3 2017.

PURPOSE AND DATA

In order to obtain a clearer overview of the vulnerabilities associated with household debt, FI needs to supplement aggregate statistics with more detailed data. The mortgage survey contains detailed data about debt levels of households with new mortgages and is therefore an important part of FI's analysis of the risks and vulnerabilities.

The purpose of the mortgage survey is to describe the situation of households with new mortgages. The survey contains information about both the new mortgages the households took 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 risks and vulnerabilities that may be associated with households' mortgages. This vulnerability analysis is one component in the assessment of whether there is a need to change 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.

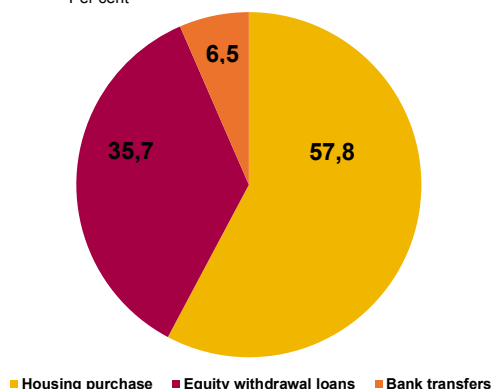
The vulnerability assessment includes an analysis of the households' repayment ability. This is an important element in assessing the households' financial resilience, and thereby the credit risks of banks. FI calculates the repayment ability for households in the survey by calculating their discretionary income. This calculation is similar to the banks' own credit assessments. In the report, FI also tests the repayment ability by exposing it to different stress tests. These stress tests enable FI to analyse the sensitivity of households to interest rate hikes, loss of income due to unemployment and falls in house prices.

The survey includes data from Danske Bank, Handelsbanken, Länsförsäkringar Bank, Nordea, SBAB Bank, SEB, Skandiabanken and Swedbank. These companies represent more than 93 per cent of the total mortgage volume in 2018 (Diagram 3). Their total market shares have decreased slightly over time, in part due to increasing

⁴ See page 10 of Finansinspektionen's *Stability in the Financial System 2018:2* for a quantification of the impact of construction and the stricter amortisation requirement on the growth of house prices. See "Evaluation of the stricter amortisation requirement" on page 13 for a quantification of the impact of the stricter amortisation requirement on house prices.

4. New mortgages by purpose

Per cent

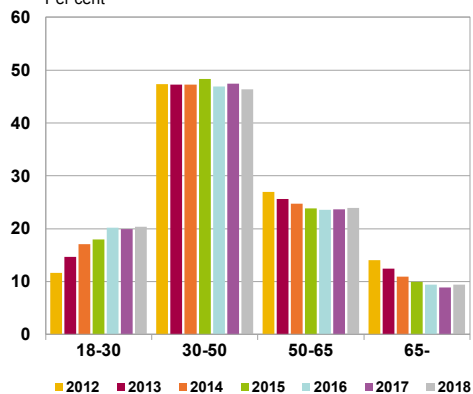


Source: Mortgage survey, sample of new loans.

Note: Refers to 2018 and the distribution by number of loans.

5. Age breakdown in the 2012-2018 mortgage surveys, new loans

Per cent



Source: Mortgage survey, sample of new loans.

Note: For households with multiple borrowers, refers to the age of the primary borrower.

competition from other mortgage providers and because the companies in the survey have become more restrictive in their lending.

The mortgage survey consists of three parts:

- *Household sample (microdata)*. The sample includes all new mortgage agreements entered into during the periods 28 August–4 September 2018 and 27 September–4 October 2018. After processing, survey data contained 24,156 households.⁵ The data includes household income and composition, total loans, loans collateralised by residential property, housing-related unsecured loans, agreed interest rates and amortisation payments, and the market value of the home. This is the eighth time FI has compiled this data. The previous samples were collected in 2009 and 2011–2017.

The data about new mortgages that FI gathers in its mortgage survey does not refer only to new mortgages for purchasing a home. New mortgages can also refer to the expansion of existing mortgages (equity withdrawal loans) and loans that resulted from the transfer of an existing loan to another bank. Distribution of new mortgages by purpose is presented in Diagram 4.

- *Aggregate data*. FI also gathers data about the banks' total lending to households for housing purposes. This data includes, for example, total volume for new lending, existing loans and amortisation payments. FI has gathered aggregate data since 2006. The data stretches back in time to 2002.
- *Qualitative information*. By answering a number of in-depth questions, banks provide both general and detailed information about their situation. These questions are related to methods for valuing residential properties, credit assessments of households and consumer protection aspects of mortgage lending.

Tables 1 and 2 break the new mortgagors in the 2018 sample down into region and age. The average debt in Stockholm was 96 per cent larger than in the region with the lowest debt (Rest of Sweden), and the average market value for the residential properties was 135 per cent higher. At the same time, the average disposable income in Stockholm was just over 24 per cent larger. The youngest borrowers (18–30) had higher income but purchased residential properties that were 30 per cent less expensive than the oldest borrowers (65+). The percentage of borrowers in the survey below the age of 30 increased since 2012, and in 2018 this figure was just over 20 per cent (Diagram 5). The percentage of borrowers above the age of 50 also decreased.

⁵ "Processing" refers to the validation FI performs on all reported data. Deficient, extreme or incorrect observations are removed.

Table 1. Geographic distribution of borrowers in the sample⁶

	Stockholm	Gtbg	Malmö	Other cities	Rest of Sweden	Total
Share of households (%)	26	11	6	20	37	100
Share of volume of new loans (%)	37	13	6	19	25	100
Average debt (SEK)⁷	3,088,485	2,690,943	2,297,399	2,102,728	1,573,650	2,236,920
Households with one borrower	2,155,134	1,774,322	1,497,388	1,384,765	1,031,762	1,518,924
Households with more than one borrower	3,669,145	3,105,184	2,763,368	2,459,866	1,860,455	2,624,547
Average market value of home (SEK)	4,681,095	4,073,252	3,148,657	2,745,745	1,992,477	3,133,841
Households with one borrower	3,540,336	3,175,774	2,155,558	1,981,611	1,452,368	2,354,489
Households with more than one borrower	5,390,788	4,478,843	3,727,091	3,125,849	2,278,341	3,554,592
Average disposable income (SEK/month)	53,293	48,850	46,525	45,356	41,395	46,436
Households with one borrower	35,436	31,030	29,612	29,233	26,693	30,320
Households with more than one borrower	64,402	56,903	56,376	53,376	49,176	55,137

Table 2. Age distribution of borrowers in the sample

	18-30	30-50	50-65	65+	Total
Share of volume of new loans (%)	22	53	20	5	100
Average debt (SEK)	1,835,180	2,585,236	2,344,704	1,432,614	2,236,920
Households with one borrower	1,245,128	1,717,013	1,669,556	1,089,818	1,518,924
Households with more than one borrower	2,272,867	2,915,775	2,659,741	1,600,636	2,624,547

⁶ In this report, "Stockholm" refers to the 26 municipalities that constitute the Greater Stockholm area. "Gtbg" refers to the 13 municipalities that constitute the Greater Gothenburg area. "Malmö" refers to the 12 municipalities that constitute the Greater Malmö area. "Other 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.

⁷ Refers to total debt: mortgages and any other loans.

Average market value of home (SEK)	2,138,810	3,437,950	3,411,746	3,057,280	3,133,841
Households with one borrower	1,657,551	2,512,317	2,723,826	2,692,069	2,354,489
Households with more than one borrower	2,542,056	3,844,415	3,780,644	3,271,571	3,554,592
Average disposable income (SEK/month)	38,613	50,447	49,871	34,853	46,436
Households with one borrower	26,569	32,181	33,935	24,188	30,320
Households with more than one borrower	48,673	58,383	58,319	41,125	55,137

Table 3 compares the borrowers' income, debt and average market value of their residential properties to the samples from previous years. The average market value of residential properties the serve as collateral for mortgages decreased by 4.4 per cent. Aside from the downturn in the past year, market values have been increasing sharply since 2012 (41 per cent). There was a small change in the average debt compared to last year, but since 2012 average debt has increased by almost 37 per cent. During the same period, disposable income increased by 19 per cent.

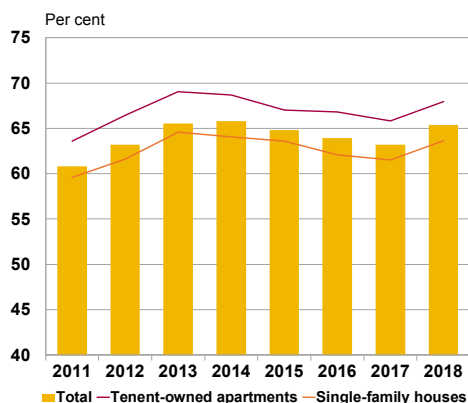
Table 3. Borrowers' average income, debt and market values in previous samples

	2012	2013	2014	2015	2016	2017	2018
Number of households	24,125	24,977	28,211	31,222	25,756	27,822	24,156
Average disposable income (SEK/month)	38,219	38,646	39,920	41,750	42,894	44,426	45,339
Since last year (%)		1.1	3.3	4.6	2.7	3.6	2.1
Since 2012 (%)		1.1	4.5	9.2	12.2	16.2	18.6
Average debt (SEK)	1,659,899	1,703,633	1,894,060	2,071,351	2,122,717	2,251,412	2,266,775
Since last year (%)		2.6	11.2	9.4	2.5	6.1	0.7
Since 2012 (%)		2.6	14.1	24.8	27.9	35.6	36.6
Average market value of home (SEK)	2,221,368	2,332,441	2,519,308	2,864,292	3,051,931	3,276,223	3,131,561
Since last year (%)		5.0	8.0	13.7	6.6	7.3	-4.4
Since 2012 (%)		5.0	13.4	28.9	37.4	47.5	41.0

Household debt

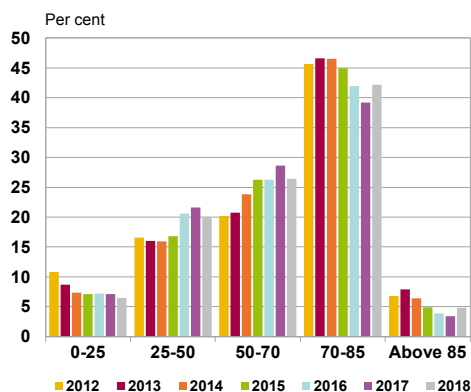
Following the introduction of the stricter amortisation requirement, the percentage of new mortgagors with a loan-to-income ratio of more than 450 per cent of gross income has decreased. The average loan-to-income ratio of new mortgagors has also decreased. Due to lower house prices, the loan-to-value ratio increased for both new mortgages and the total stock of existing mortgages. A high percentage of the new mortgagors continue to have high loan-to-value ratios or high loan-to-income ratios.

6. Average loan-to-value ratio, new loans



Source: Mortgage survey, sample of new loans.

7. Households broken down by loan-to-value ratio, new loans



Source: Mortgage survey, sample of new loans.

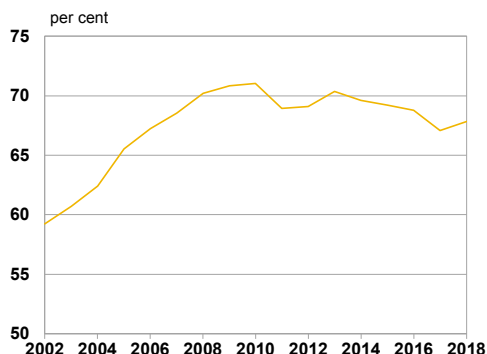
Household debt can be set in relation to other variables to facilitate comparisons between households and over time. The loan-to-value ratio is calculated as the size of the loan used to finance the purchase of the residential property divided by the market value of the property. If a fall in house prices were to result in the value of the home being less than the mortgage (negative equity), there is a risk that the household would find itself in a difficult financial position. A higher loan-to-value ratio thus means that the household is less resilient to falling house prices. 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 simultaneously decrease their consumption, this would have a negative impact on the economy.

The loan-to-income ratio is another measure of household debt. The loan-to-income ratio can be calculated as loans in relation to net income (after tax) or gross income (before tax). A high loan-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 loan-to-income ratio, therefore, shows how vulnerable a household is to increases in interest rates and a loss of income. From an economic perspective, a loan-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. On the other hand, a loan-to-income ratio calculated using gross income is easier for borrowers and banks to calculate.⁸

The combination of a household's loan-to-value ratio and loan-to-income ratio offers a more complete overview of the household's vulnerability. Households that have both a high loan-to-income ratio and a high loan-to-value ratio are most vulnerable. They are vulnerable to a fall in house prices, a loss of income and an increase in interest rates, and primarily to combinations of these three. The link between households' loan-to-value ratios and loan-to-income ratios is relatively weak among new borrowers. A household with a high loan-to-value ratio does not necessarily have a high loan-to-income ratio or the reverse (Diagram B2.1/B2.2 in Appendix 2). The percentage of households that have both a high loan-to-income ratio (more than 450

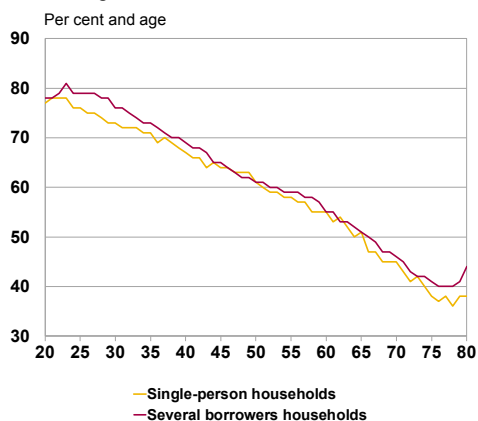
⁸ In this report, the loan-to-income ratios shown in the diagrams are normally calculated using gross income. The statistics appendix to this report also includes the same diagrams with the loan-to-income ratio calculated using net income.

8. Average volume-weighted loan-to-value ratio, new loans
per cent



Source: Mortgage survey, aggregate data.

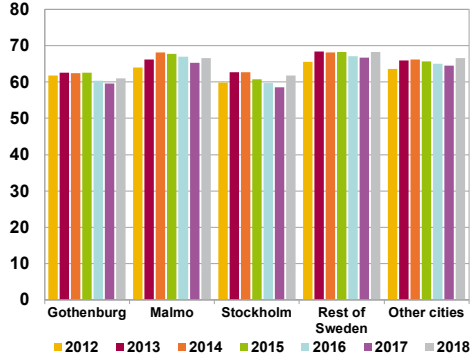
9. Relationship between loan-to-value ratio and age, new loans
Per cent and age



Source: Mortgage survey, sample of new loans.

Note: Age on the X-axis and average loan-to-value ratio on the Y-axis. Refers to 2018.

10. Loan-to-value ratio by region, new loans
Per cent



Source: Mortgage survey, sample of new loans.

per cent of gross income) and a high loan-to-value ratio (more than 70 per cent) has decreased. In the 2018 mortgage survey, this figure was 4.5 per cent compared to 6.8 per cent in the 2017 survey.

LOAN-TO-VALUE RATIOS ROSE

Lower house prices have meant that households have bought less expensive homes. However, the size of households' new loans did not decrease to the same extent. Rather, the average loan-to-value ratio increased. For new mortgagors this figure was 65 per cent in the 2018 survey (Diagram 6). The figure was 2 percentage points higher than in the 2017 survey. The loan-to-value ratio was thus back at the same level as in the 2014 survey. A large percentage of the new borrowers still had a high loan-to-value ratio. The percentage of households with a loan-to-value ratio of more than 70 per cent increased by 3 percentage points to just over 45 per cent (Diagram 7). FI also calculates a volume-weighted average loan-to-value ratio for households with new mortgages.⁹ The value of this ratio also increased in the 2018 survey after having slowed every year since the 2013 survey (Diagram 8).

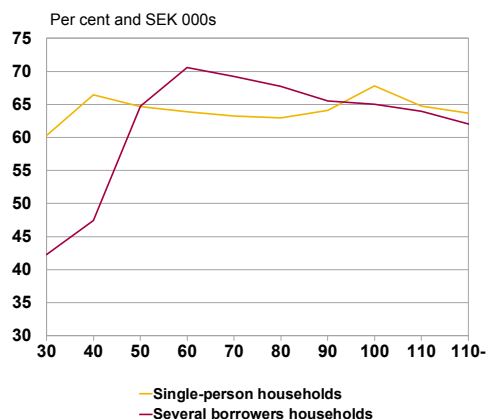
Households with new mortgages and a loan-to-value ratio of more than 85 per cent have supplemented their mortgages with an unsecured loan. The percentage of new borrowers with unsecured loans was 3.6 per cent in the 2018 survey, which was more than in the 2017 survey.¹⁰ Therefore, the percentage of new borrowers with loan-to-value ratios of more than 85 per cent was slightly larger. The average unsecured loan was SEK 165,000, which was somewhat higher than in previous surveys. Despite the increase in unsecured loans, the volume of these loans is limited in the total volume of mortgages to 0.9 per cent. It is primarily borrowers up to the age of 50 who use unsecured loans, and the most common reason for using an unsecured loan is to finance the downpayment for the home.

The loan-to-value ratio increased in all age categories in the 2018 survey. There is a clear negative correlation between age and the average loan-to-value ratio for households with new mortgages (Diagram 9). The loan-to-value ratio is highest for the youngest borrowers and falls as the age rises. This is because households that have just started their property and professional careers often have limited savings to use as a downpayment and therefore need a larger loan given a certain price. Through the appreciation of previous properties, amortisation payments and other savings, older borrowers have accumulated a larger downpayment for purchasing a residential property.

⁹ The volume-weighted loan-to-value ratio is determined by first calculating the average volume-weighted loan-to-value ratio for each bank's total new lending. Then the banks' average loan-to-value ratios are weighted by their respective market share of total new lending to achieve the total average loan-to-value ratio.

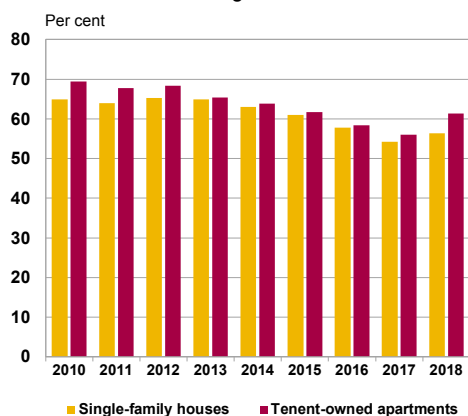
¹⁰ Unsecured loans included here include unsecured loans raised by the borrower from the bank that issued the new mortgage and in conjunction with the new mortgage. Unsecured loans taken from a bank other than that which issued the mortgage with the aim of financing the property are not included in this data. The percentage of households that use unsecured loans to finance mortgages are therefore likely to be underestimated here.

11. Relationship between loan-to-value ratio and income, new loans



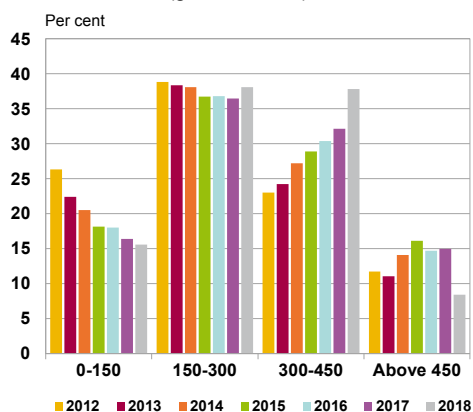
Source: Mortgage survey, sample of new loans.
Note: Household gross income per month on X-axis. Average loan-to-value ratio on Y-axis.

12. Loan-to-value ratio broken down by object, total stock of existing loans



Source: Mortgage survey, aggregate data.
Note:

13. Households broken down by loan-to-income ratio (gross income), new loans



Source: Mortgage survey, sample of new loans.
Note: Loan-to-income ratio calculated using gross income and total debt.

In all regions, the loan-to-value ratio for new borrowers was higher in the 2018 survey than in the 2017 survey (Diagram 10). The largest increase was for new borrowers in Stockholm, where the downturn in house prices was most evident. Despite this, the average loan-to-value ratio is lower in the metropolitan areas of Gothenburg and Stockholm, where homes are most expensive. The highest loan-to-value ratios were in regions where house prices are lowest. One explanation for this is that there are many households in the larger cities that made significant capital gains from price increases in previous homes. They have thus been able to lower their loan-to-value ratio by using a larger cash deposit when purchasing their next home.

If the new borrowers are broken down by income, the loan-to-value ratio is lowest for households with several borrowers and the lowest incomes (Diagram 11). These borrowers are primarily found in smaller municipalities where house prices are lower. Borrowers that are single-person households have approximately the same loan-to-value ratio regardless of income.

The loan-to-value ratio can also be calculated for the total stock of households' existing mortgages. The average loan-to-value ratio for existing mortgages changes due to the market value of the property and amortisation payments. The existing loans therefore on average have a lower loan-to-value ratio than new mortgages. The extent to which existing mortgages are expanded or paid off also affects the loan-to-value ratio. Due to the downturn in prices on the housing market, the banks have made downward adjustments to the market values of the properties that constitute collateral for existing mortgages. The loan-to-value ratio for the loans has thus increased. The effect was largest for mortgages collateralised by tenant-owned apartments, where the average loan-to-value ratio increased by 6 percentage points (Diagram 12). For single-family homes, the loan-to-value ratio increased by 2 percentage points. Due to the falling house prices, the percentage of existing borrowers with a loan-to-value ratio in excess of 85 percent increased from 2 to 6 percent.

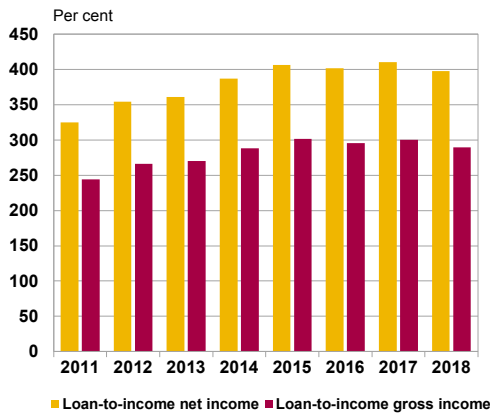
LOWER LOAN-TO-INCOME RATIO AFTER STRICTER AMORTISATION REQUIREMENT

FI introduced a stricter amortisation requirement on 1 March 2018.¹¹ After the introduction of the stricter requirement, the share of new borrowers with loan-to-income ratios above 450 per cent of gross income has fallen from 15 to 8 per cent (Diagram 13). The average loan-to-income ratio for new borrowers decreased from 300 per cent in the 2017 survey to 290 per cent in the 2018 survey (Diagram 14). If the loan-to-income ratio is calculated using net income, it decreased from 410 to 398 per cent.

A stricter amortisation requirement based on households' gross income and total collateralised mortgages

11 FFFS 2017:23. Regulations amending Finansinspektionen's regulations (FFFS 2016:16) regarding amortisation of loans collateralised by residential property.

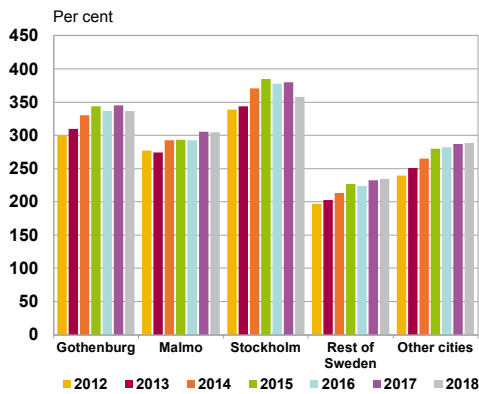
14. Average debt-to-income ratio, gross and net income, new loans



Source: Mortgage survey, sample of new loans.

Note: Debt-to-income ratio calculated using total debt.

15. Debt-to-income ratio (gross income) by region, new loans



Source: Mortgage survey, sample of new loans.

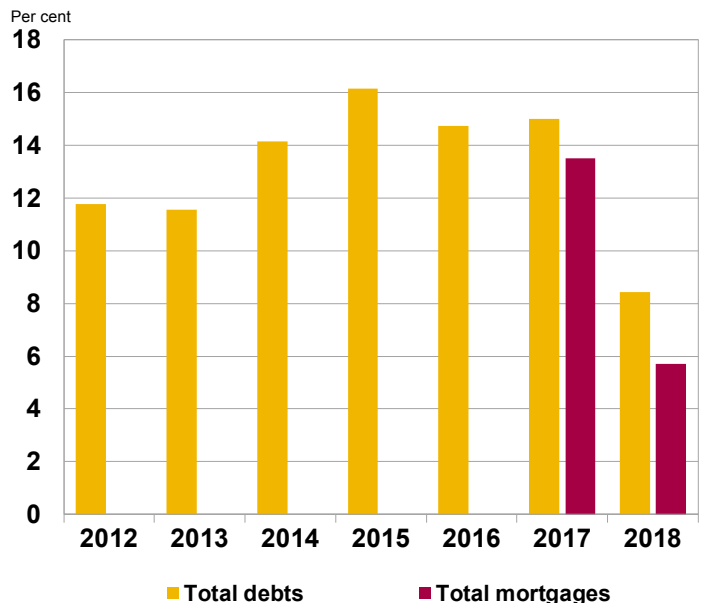
Note: Debt-to-income ratio calculated using gross income and total debt.

Under the stricter amortisation requirement, even borrowers with a high loan-to-income ratio must amortise. Borrowers that take out a new mortgage and have a loan-to-income ratio of more than 450 per cent of gross income on an annual basis must amortise at least 1 per cent of the loan's original value. The amortisation requirement from the stricter requirement is in addition to any amortisation from the first amortisation requirement. Therefore, households that take a new mortgage and have both a loan-to-income ratio of more than 450 per cent and a loan-to-value ratio of more than 70 per cent may need to amortise up to 3 per cent following the introduction of the stricter requirement.

The loans included in the calculation of the loan-to-income ratio consists solely of loans collateralised by a home. The household's new mortgage and any previous mortgages already held should be included. If a household with a mortgage on a property buys another property, for example a holiday home, the loan for both of the objects should be summed when calculating the loan-to-income ratio. This is different from the first amortisation requirement, where the loan-to-value ratio is calculated per object.

For households that have debt other than mortgages, the debt-to-income ratio calculated using total debt will be larger than the loan-to-income ratio that serves as a basis for the stricter amortisation requirement. The percentage of households with a loan-to-income ratio of more than 450 per cent is also smaller since the loan-to-income ratio is estimated as per the definition used for the stricter amortisation requirement. Using the definition of loan-to-income ratio from the stricter amortisation requirement, 5.7 per cent of the new borrowers would have a loan-to-income ratio of more than 450 per cent in the 2018 survey (Diagram B1). This marks a clear decrease from the 2017 survey, where the corresponding share was only 13.7 per cent.

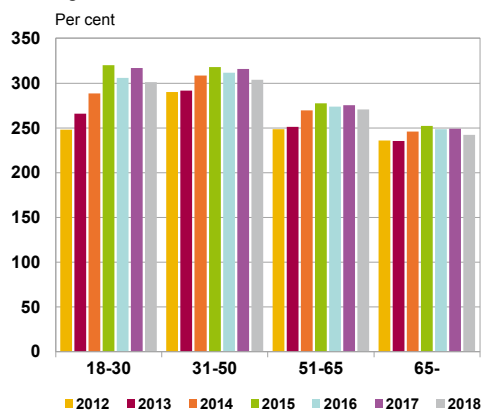
B1. Percentage of new borrowers with a debt-to-income ratio (total debt) and loan-to-income ratio (total mortgage) of more than 450 of gross income



Source: Mortgage survey, sample of new loans.

Note: Starting in 2017, the mortgage survey contains sufficient data to be able to isolate mortgages from total debt.

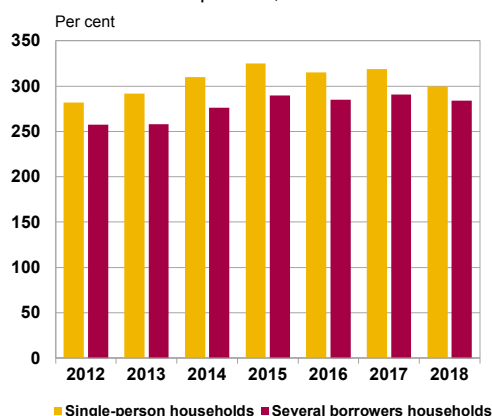
16. Loan-to-income ratio (gross income) by age, new loans



Source: Mortgage survey, sample of new loans.

Note: Debt-to-income ratio calculated using gross income and total debt.

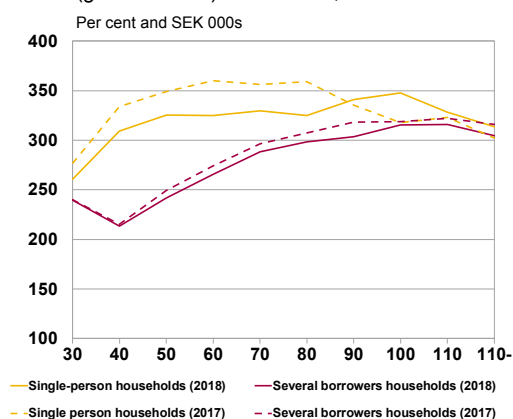
17. Loan-to-income ratio (gross income) by household composition, new loans



Source: Mortgage survey, sample of new loans.

Note: Debt-to-income ratio calculated using gross income and total debt.

18. Relationship between loan-to-income ratio (gross income) and income, new loans



Source: Mortgage survey, sample of new loans.

Note: Household gross income (000s) per month on X-axis. Average loan-to-value ratio on Y-axis.

In the metropolitan areas, a higher percentage of new borrowers are affected by the stricter amortisation requirement, with the highest being the percentage in Stockholm. The average loan-to-income ratio for new borrowers also decreased the most in Stockholm in the 2018 survey. The loan-to-income ratio (gross income) decreased by 22 percentage points in Stockholm and 9 percentage points in Gothenburg (Diagram 15). The loan-to-income ratio for borrowers in other areas of the country only changed negligibly.

The loan-to-income ratio decreased in all age categories of new borrowers in the 2018 survey (Diagram 16). The loan-to-income ratio in the lower age categories decreased the most. The average loan-to-income ratio for new mortgages is higher for borrowers younger than 50. Therefore, a higher percentage of these borrowers are affected by the stricter amortisation requirement.

Of the new borrowers, 65 per cent are households with multiple borrowers and 35 per cent are single-person households. Borrowers who are single-person households as a rule have a higher loan-to-income ratio than households with several borrowers (Diagram 17). The loan-to-income ratio decreased the most for borrowers who are single-person households. Between 2017 and 2018, the average loan-to-income ratio (gross income) for borrowers who are single-person households decreased from 319 to 302 per cent. For households with several borrowers, it decreased from 291 to 288 per cent.

For households with new mortgages that consist of several borrowers, there is a positive correlation between the loan-to-income ratio and income (Diagram 18). Borrowers with higher income often live in metropolitan areas, where house prices and debt are generally higher. For borrowers in single-person households, this correlation is not as evident. Compared to the 2017 survey, the loan-to-income ratio decreased the most for borrowers in single-person households and households that had good income. For households with several borrowers, changes to the loan-to-income ratio were minimal.

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Evaluation of the stricter amortisation requirement

This box describes how the stricter amortisation requirement affected the size of the loans taken by households with new mortgages and the price of the properties they buy. The box shows some of the results from Andersson and Aranki (2019).¹²

12 Andersson, M. and Aranki T. (2019), "Fewer vulnerable households after the stricter amortisation requirement", FI Analysis XX, Finansinspektionen.

The stricter amortisation requirement applies to new mortgagors with loans in excess of 450 per cent of gross income. These mortgagors must amortise 1 percentage point of their loan per year in addition to the amortisation payments required by the first amortisation requirement. The stricter requirement also affects some new mortgagors in that they borrow much less so as to come under the loan-to-income ratio of 450 per cent and thus avoid the stricter amortisation requirement. Prior to the introduction of the stricter amortisation requirement, FI expected the percentage of new mortgagors with a loan-to-income ratio of 450 per cent to be reduced by half. After the introduction, the percentage decreased from 13.5 to 5.7 per cent. This means that the percentage of vulnerable households has decreased.

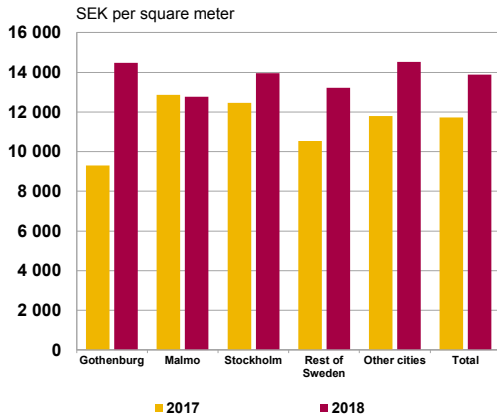
The stricter amortisation requirement has resulted in a change of behaviour among households with new mortgages. Those affected by the stricter requirement borrow on average 8.5 per cent less than they otherwise would have done. They are also buying less expensive homes. But the stricter requirement only affects a small percentage of all new mortgagors. This means that the total effect is limited; new mortgagors buy properties that on average are 1.2 per cent less expensive and borrow on average 1.5 per cent less as a result of the stricter amortisation requirement. The effect of the stricter amortisation requirement is relatively small compared to the first amortisation requirement, under which new mortgagors borrowed around 9 per cent less and bought properties that on average were 3 per cent less expensive (Diagram B2). This is because the first amortisation requirement had an impact on more new mortgagors.

Single-person households and the oldest mortgagors have adapted their behaviour the most following the stricter amortisation requirement. Those affected by the stricter amortisation requirement are purchasing less expensive properties and borrowing less, regardless of where they live in the country. However, because more households in Stockholm and Gothenburg are affected than in other regions, the growth rate of mortgages and housing demand slowed the most in these two cities. There was also more of a decrease in the size of the loans among new mortgagors with high income since this group of households was most affected by the stricter requirement.

B2. Impact of amortisation requirement on new mortgages and house prices

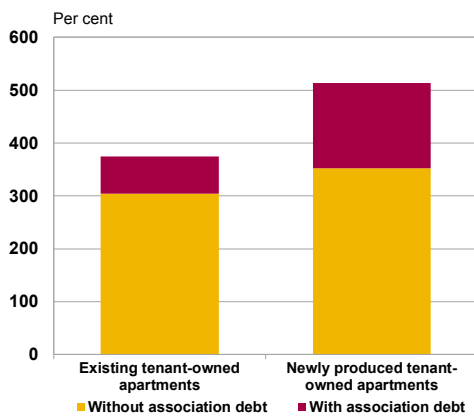
Per cent

19. Tenant-owner associations' average debt, newly produced tenant-owned apartments, new loans



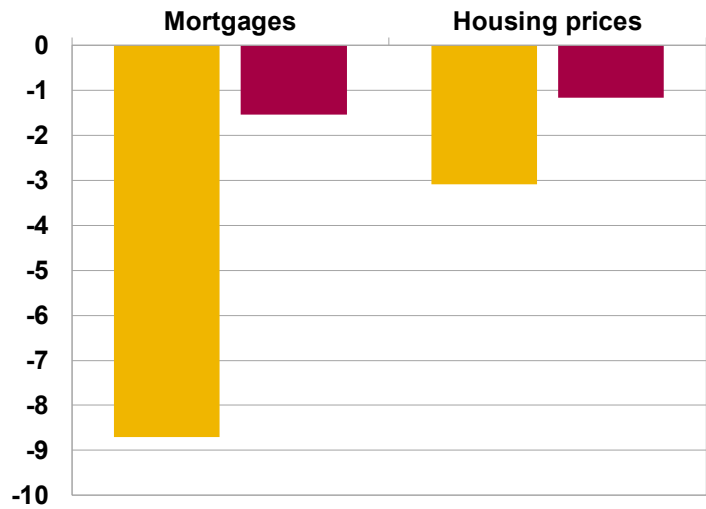
Source: Mortgage survey, sample of new loans.

20. Loan-to-income ratio (gross income, including the percentage of the tenant-owner association's debt), new loans



Source: Mortgage survey, sample of new loans.

Note: Yellow fields show the loan-to-income ratio (gross income) for new mortgages collateralised by tenant-owned apartments. Yellow and red fields show the loan-to-income ratio including the percentage of the tenant-owner association's debt. Calculated for households where the banks were able to specify both the size of the property and the debt of the tenant-owner association.



■ First amortisation requirement
■ Stricter amortisation requirement

Source: Mortgage survey, sample of new loans.

Note: Ange anmärkning

INCREASE IN DEBT IN TENANT-OWNERS ASSOCIATIONS WITH NEWLY PRODUCED APARTMENTS

Starting with the 2017 mortgage survey, FI began to gather information about the tenant-owner association debt for households taking on a new mortgage collateralised by a tenant-owned apartment. The banks' lending to tenant-owner associations has continued to increase rapidly even if this growth slowed slightly in 2018.¹³ The debt of these associations is an indirect debt for the owner of a tenant-owned apartment in an association. If interest rates rise, the association's interest rate expenses rise. This means that associations with high debt over time will need to raise the fees for their members in order to maintain the same maintenance standard and amortisation rate on their loans.

Existing tenant-owner associations' average debt was SEK 5,800 per square meter in 2018. This represents an increase of roughly 3 per cent compared to the previous year. Associations in the metropolitan areas had slightly larger debt than associations in other regions. For newly produced tenant-owner associations in newly formed associations, the average debt was SEK 13,900 per square meter (Diagram 19). This is a noticeable increase compared to 2017 when the debt was 11,700 per square meter. The largest increase was for newly produced tenant-owned apartments in Gothenburg.

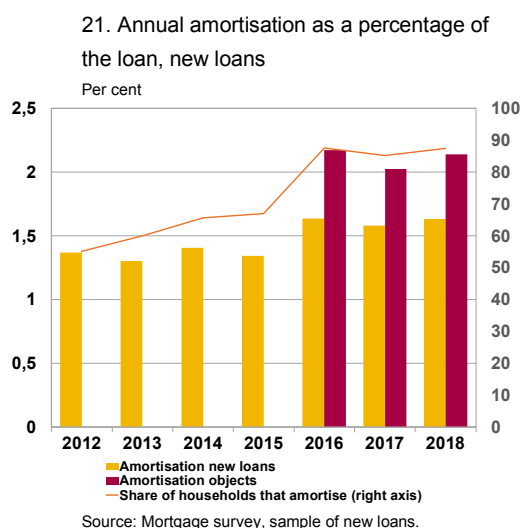
If the tenant-owned apartments' percentage of the associations' debt is included in the calculation of households' loan-to-income ratios (gross income), the ratio is much higher. For households in existing associations, the loan-to-income ratio is around 23 per cent higher,

¹³ In 2018, lending to tenant-owner associations increased by 5,5 per cent. The associations' debt to banks and institutions as at 31 December 2018 was SEK 482 billion, according to SCB's financial market statistics.

and for households in associations with newly produced tenant-owned apartments, more than 46 per cent higher (Diagram 20). Including the percentage of the association's debt, the average loan-to-income ratio for borrowers who purchased a newly produced tenant-owned apartment was 514 per cent. The highest loan-to-income ratio including the association's debt was found for households that took a new loan to buy a newly produced tenant-owned apartment in Stockholm, 543 per cent.

Households' amortisation payments

New mortgagors have increased their amortisation payments over a period of several years. Following the stricter amortisation requirement, amortisation payments increased even more. More or less all borrowers with a high loan-to-value ratio or loan-to-income ratio now amortise.



Amortisation reduces a household's debt over time, and thus also the household's loan-to-value ratio and loan-to-income ratio. The stricter amortisation requirement that was introduced in March 2018 supplements the first amortisation requirement from 2016. The amortisation requirements have played a large role in increasing households' amortisation payments.

Within its supervision of the banks' mortgage lending activities, FI follows up that the amortisation requirements are met. FI makes the assessment that banks, like before, comply with the current amortisation requirement. For the few cases where a bank did not fully comply with the requirement, FI continued with an in-depth investigation to determine the cause of the non-compliance and ensure that the requirement will be followed in the future.

To provide a more accurate overview of how households are meeting the amortisation requirement, new borrowers' amortisation payments in this report are shown as the sum of the amortisation payments for the housing objects owned. The reports from previous years have shown amortisation payments for new loans. If a household that takes on a new mortgage already has a mortgage from before that is being amortised, the amortisation payments for the new loan will not give a complete overview of the household's amortisation payments. This situation can arise, for example, when the household buys another object or takes a new mortgage by expanding an existing mortgage with an equity withdrawal loan. On average, the amortisation payments calculated for objects are larger than the amortisation payments calculated for new loans (Diagram 21).¹⁴

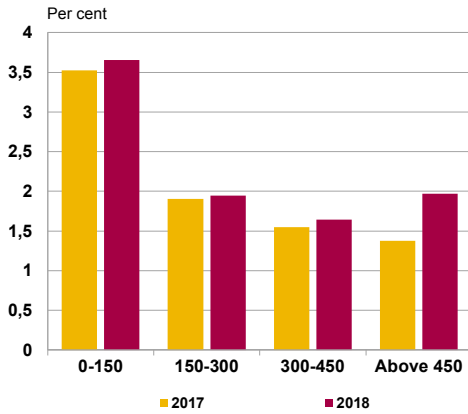
NEW BORROWERS WITH HIGH LOAN-TO-INCOME RATIOS AMORTISED MORE

Of the new borrowers in the 2018 survey, 87 per cent amortised, and their average amortisation payment per month was just over SEK 2,900. For households subject to at least one of the amortisation requirements, the percentage of borrowers that amortised varied between 83 and 99 per cent (Figure 1). There can be several reasons for why not all borrowers amortise. For example, households that did not amortise may qualify for one of the exemptions allowed under the amortisation requirements.¹⁵ It is also possible that a few households

¹⁴ The mortgage survey only provides FI with data for calculating amortisation per collateral as of 2016.

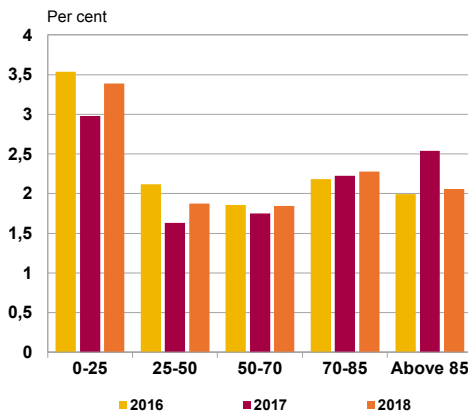
¹⁵ Households that due to their loan-to-value ratio or loan-to-income ratio, or both, normally would amortise under the amortisation requirement may be exempt from amortising under the exemption rules in the amortisation requirement. The exemption possibility applies to new loans generated by moving an existing loan from one bank to another. In this case, the

22. Amortisation as a percentage of loans by loan-to-income ratios, gross income, new loans



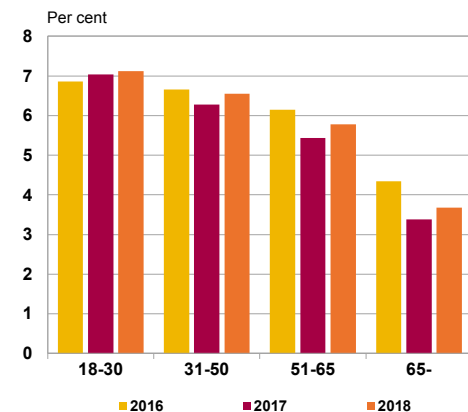
Source: Mortgage survey, sample of new loans.
Note: Loan-to-income (gross income) ratio calculated using total mortgages in accordance with the stricter amortisation requirement.

23. Amortisation as a percentage of loans by loan-to-value ratios, new loans



Source: Mortgage survey, sample of new loans.

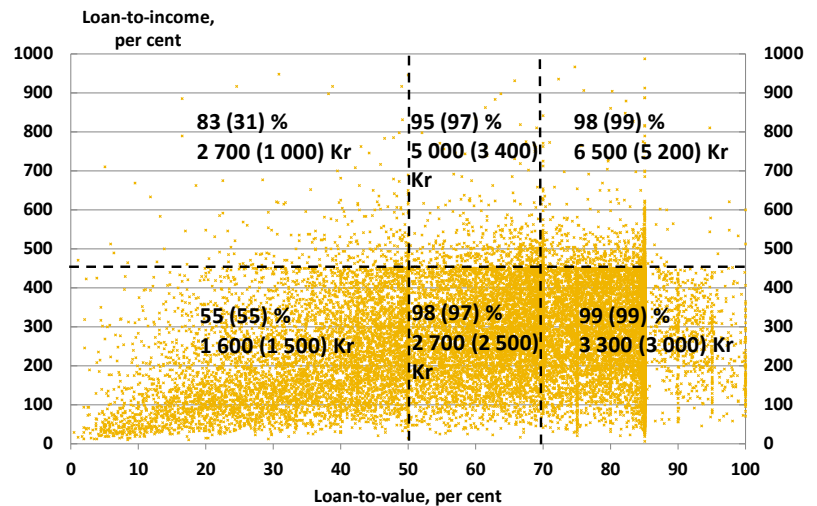
24. Amortisation payment as a percentage of disposable income by age, new loans



Source: Mortgage survey, sample of new loans.

will be amortising in accordance with the amortisation requirement, but they have not started yet. For the category new borrowers that are not subject to the first amortisation requirement but are subject to the stricter amortisation requirement (loan-to-value ratio of less than 50 per cent and loan-to-income ratio of more than 450 per cent), the percentage that amortise increased sharply. For other categories of new borrowers that are affected by the stricter amortisation requirement, the average amortisation payment increased noticeably.

Figure 1. Percentage that amortise and average amortisation per month
Per cent and SEK



Source: Mortgage survey, sample of new loans in the 2018 survey.
Note: Percentage that amortise and average amortisation payment per month in SEK in the 2018 survey. The figures in parentheses are for corresponding percentages and amounts in 2017. The loan-to-income ratio using gross income and total mortgages in accordance with the definition in the stricter amortisation requirement. Average amortisation for the households that amortise. A dot represents one household.

In relation to the size of the loan, the average annual amortisation payment was 2.1 per cent for new borrowers in the 2018 survey. For new borrowers with a loan-to-income ratio of more than 450 per cent, amortisation payments increased to almost 2 per cent (Diagram 22). If the new borrowers instead are broken down by loan-to-value ratio, amortisation payments in relation to the loan increased slightly in all categories except those with the highest loan-to-value ratios (Diagram 23).

New borrowers' amortisation payments in relation to income increased slightly for all age categories in the 2018 survey. As a percentage of disposable income, the size of the amortisation payments appears to be largest for the youngest borrowers (18–30) (Diagram 24). This is because younger borrowers often have a higher loan-to-value ratio and a higher loan-to-income ratio. Young, single-family households amortise the most. In this category, amortisation payments corresponded to almost 8 per cent of disposable income in the 2018 survey. Amortisation as a percentage of income falls as age rises. The percentage is lowest for the oldest borrowers (65+).

borrower is able to keep the original amortisation terms. When acquiring a newly produced apartment, it is possible to receive exemption from the amortisation requirement for five years.

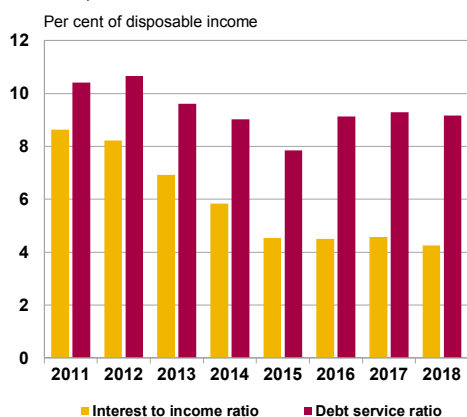
For the total mortgage stock, amortisation payments amounted to SEK 54 billion in the 2018 survey.¹⁶ This means that average annual amortisation payment in relation to the size of the loan was 1.8 per cent for existing mortgages. The total amortisation volume increased by 12 per cent compared to in the 2017 survey, at the same time as the total mortgage volume increased by more than 6 per cent.

¹⁶ Refers to Q4 2017 – Q3 2018.

Household repayment ability

FI assesses the new mortgagors repayment ability as part of the mortgage survey. The calculations and the stress tests show that their repayment ability is good in general. As a whole, FI makes the assessment that there is a limited risk that the banks will experience widespread credit losses on their mortgage exposures.

25. Interest-to-income ratio and debt service ratio, new loans



Source: Mortgage survey, sample of new loans.

Note: Shows interest rate payments (interest-to-income ratio) and the sum of interest and amortisation payments (debt service ratio) as a percentage of household disposable income. The payments are based on contractual interest rates and amortisation payments.

In a scenario with an economic downturn, the margin between income and expenses could shrink for many households. FI's stress tests calculate how many households with new mortgages would experience a budget deficit given various negative scenarios. Households that have more expenses than income may find it difficult to pay off their loans. If many households were to experience such a deficit at the same time, in the long run this could lead to credit losses at the banks. However, 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 live more frugally for a period of time. The opposite is also true: even households that do not experience a deficit might be forced or choose to reduce their consumption, and reduced consumption has a negative impact on macroeconomic development. Such effects are not captured by the stress tests in this report.

High debt could mean greater vulnerability to a loss of income or lower asset prices. One way to measure a household's debt burden is to measure how much of its disposable income goes to its loans. The interest-to-income ratio measures interest rate payments as a percentage of disposable income. The debt service ratio measures both interest rate payment and amortisation payments as a percentage of disposable income. The average interest-to-income ratio for new mortgagors fell until 2015 as interest rates fell (Diagram 25). Since then, this ratio has remained stable. Households with new mortgages allocated on average 4.3 per cent of their disposable income to interest rate payments in the 2018 survey. The debt service ratio also fell until 2015. Amortisation payments have increased since then, which means the debt service ratio has also increased. New mortgagors paid on average 9.2 per cent of their disposable income to interest and amortisation payments in the 2018 survey.

HOW THE BANKS ASSESS HOUSEHOLDS' REPAYMENT 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 are also a part of good consumer protection. FI therefore reviews the banks' methods.

When a household applies for a mortgage, it provides information about income and debt. A bank deducts estimated expenses from household income as part of its discretionary income calculation. These expenses include 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 deduct 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 household has other large assets or additional income that has not been included in the calculation, a low loan-to-value ratio or a temporary bridging loan.¹⁷

The average standardised cost for one adult was SEK 8,950/month in the 2018 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 the 2018 survey, which is the same rate used for the past two years and one-half of a percentage point higher than the rate used in 2015. The interest rate used in the discretionary income calculation is not an exact measurement of the strictness of the banks' credit assessments. For example, standardised costs also affect borrowers' discretionary income calculations. Standardised costs vary by bank, primarily in terms of the individual components. For example, the standardised cost for one adult varies between SEK 6,100 and SEK 11,500 in this year's mortgage survey. The variation between the banks is reduced when taking into consideration all cost components.

HOW DOES FI ASSESS HOUSEHOLDS' REPAYMENT ABILITY?

FI conducts its own calculations of the households' monthly surpluses (its own discretionary income calculations).¹⁸ FI uses the interest rate that applied at the time the loan is granted and not the higher interest rate banks use in their discretionary income calculation. FI's calculations are therefore not directly comparable to the banks' calculations. 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.

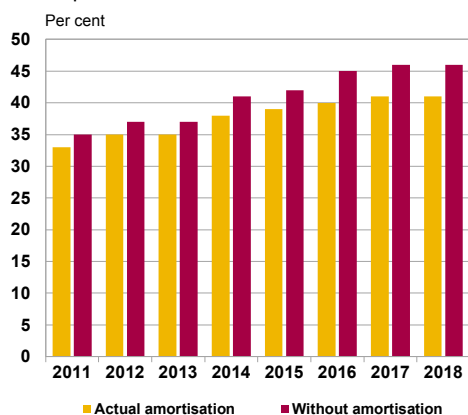
FI's stress tests treat all households equally and therefore uses the average of the banks' standardised costs and discretionary income interest rates.¹⁹ Standardised costs are based on the size of the

17 A bridging loan is a temporary loan granted for the period between when a household has paid for its new home but not yet received payment for the old home that it has sold or intends to sell.

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

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 households' homes, standardised costs are used instead. Hence, FI's calculations are not as precise for individual households as the banks' calculations are. Furthermore, the banks can also take into consideration in their assessment of a household's repayment ability the financial assets of the household. Because FI lacks such information, this is not possible in the analysis. The banks' methods for determining households' repayment ability vary. The use of a standardised calculation for all banks enables consistent comparisons between the banks. Deficits in FI's discretionary income calculations do not necessarily mean that the households will experience a deficit in the banks' calculations.

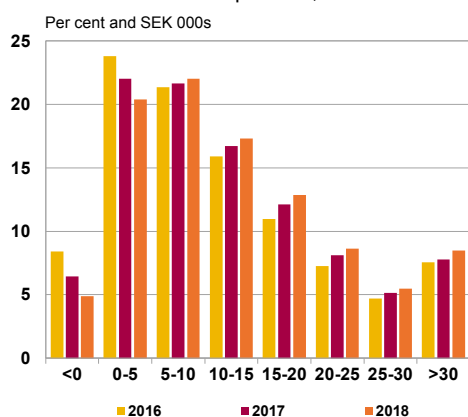
26. Monthly surplus as a percentage of disposable income, actual interest, new loans



Source: Mortgage survey, sample of new loans.

Note: Actual interest that the household pays. Monthly surplus is what is left from the disposable income after paying for housing and subsistence costs.

27. Breakdown of households into different monthly surplus intervals (SEK thousand) at an interest rate of 7 per cent, new loans



Source: Mortgage survey, sample of new loans.

Note: The monthly surplus was calculated given the contractual amortisation payments. An interest rate of 7 per cent more or less equals a level that is 5 percentage points higher than the 2015-2018 average and around the level of the banks' discretionary income interest rate.

household, the household composition and the type of the home. They do not refer to the households' actual expenses at the time of the loan, but rather provide an estimate of the households' necessary expenses. Therefore, FI's stress tests do not capture that households 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 gross income.²⁰ Child benefits, if applicable, are then added.

The standardised costs that the banks use have increased over time, but they fell between 2015 and 2016. In its assessment of household resilience, FI has chosen to use the subsistence costs for 2015.²¹ 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 expenses twice.²² For the 2018 calculations, FI uses standardised costs of SEK 9,700/month for one adult and SEK 24,000/month for a family of two adults and two children.²³

HOUSEHOLD MARGINS ARE SOUND

The financial margins of households for paying off debt are sound in general. According to FI's calculations, households in the sample have on average a surplus of SEK 20,600 per month.²⁴ This corresponds to 41 per cent of their disposable income. The surplus in relation to income for new mortgagors is therefore the same for both 2017 and 2018. The surplus increased every year during the period 2011–2017 (Diagram 26). One reason for this is that the interest rates that new mortgagors are paying on their loans have fallen, but falling interest rates do not explain the entire increase in the surplus. Even when the level of the interest rate is held constant in the calculation, the surplus increased over time, although not to the same extent. It is primarily after 2015 that the increase in the surplus can be explained by factors other than the interest rate. Higher income among new borrowers compared to previous years and stricter credit assessments can be two such factors.

Just over 9 per cent of households with new mortgages had less than SEK 5,000 left over every month, given their actual interest rate and

20 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.

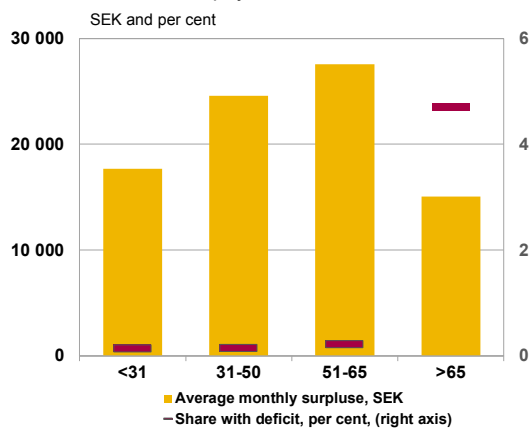
21 In order to take a cautious approach to its calculation, FI has chosen 2015 as the base year for the standardised costs. This leads to a slightly higher cost than if the average for the banks' standardised costs from 2018 had been used.

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

23 The Swedish Consumer Agency's benchmarks for 2018 were between SEK 6,910 and SEK 18,630 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): "Konsumtverkets beräkningar av referensvärden".

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

28. Monthly surplus by age group, without amortisation payments, new loans



Source: Mortgage survey, sample of new loans.

amortisation payments. This was slightly more than in the 2017 survey. The percentage of households with new mortgages with a deficit at the time the mortgage was granted was around 1 per cent in the 2018 survey. This can be compared to a figure of just under 1 per cent in the 2017 survey and 1.3 per cent in the 2016 survey. Using an assumption of a higher discretionary income interest rate (7 per cent), 25 per cent of the households had less than SEK 5,000 left over every month (Diagram 27). This was a slightly smaller share than in the 2017 and 2016 surveys. As a whole, fewer households had small margins, and more households had good margins, compared to previous years.

As in previous years, the youngest (up to 30) and oldest (65+) new mortgagors had the lowest average monthly surpluses (Diagram 28). This is because these borrowers often have lower income and are more likely to be single-person households compared to the borrowers in other categories. The surplus increased the most for the borrowers in the age group 51–65 compared to the 2017 survey. The average surplus also increased for the youngest borrowers and those in the age group 31–50. In contrast, the surplus decreased for borrowers in the age group 65+. In FI’s discretionary income calculations, 4.7 per cent of the oldest borrowers had a deficit in the 2018 survey. This can be compared to 6 per cent in the 2017 survey. The corresponding percentage with a deficit in the other age groups was under 1 per cent. The percentage with a deficit increased slightly in the youngest age group and for borrowers in the age group 31–50.

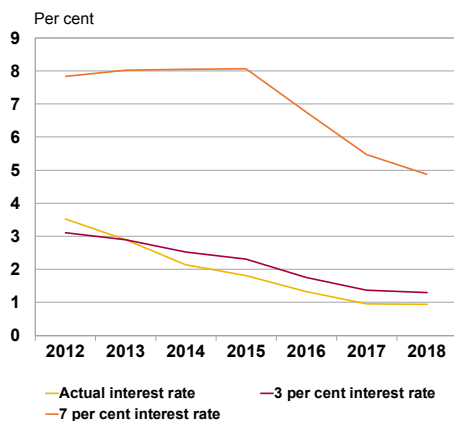
STRESS TESTS SHOW GOOD BUT SLIGHTLY SMALLER MARGINS

FI conducts stress tests to assess households’ resilience to a deterioration in their financial circumstances. In its stress tests, FI estimates how the households’ repayment ability is affected by rising interest rates, unemployment, or a drop in the value of the home. Interest rate increases and unemployment mean that households will have less money to live on. A fall in house prices means that the households’ assets will decrease in value and the loan-to-value ratio will increase. FI has analysed five possible negative scenarios:

- higher interest rate
- higher unemployment
- higher interest rate and higher monthly fees due to the debt of tenant-owner associations
- higher interest rates and lower house prices
- higher unemployment and lower house prices

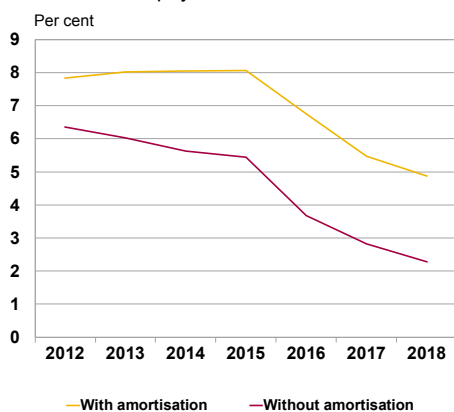
The first three scenarios estimate the percentage of households that would have a deficit in their monthly budget. The last two estimate the percentage of households that both have a deficit and a loan-to-value ratio of more than 100 per cent (i.e. negative equity). In the stress tests for the first two scenarios, FI compares the percentage of households with new mortgages that have a deficit during the period 2011–2018.

29. The percentage of households with a deficit between income and expenses by interest rate, new loans



Source: Mortgage survey, sample of new loans.

30. The percentage of households with a deficit between income and expenses at an interest rate of 7 per cent, with and without amortisation payments, new loans



Source: Mortgage survey, sample of new loans.

The third scenario also considers the debt of tenant-owner associations.²⁵ If the interest rate increases for the tenant-owner association, this may mean that they will need to raise their fees.²⁶ 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.²⁷

Interest rate sensitivity

The fact that households have buffers in their finances helps them handle higher interest rate expenses. They can also protect themselves against higher interest rates by fixing their mortgage rate. The 2018 mortgage survey showed that 31 per cent of households had an average interest rate adjustment period of more than one year. This was one percentage point more than in the previous year. The average mortgage rate was 1.58 per cent.

FI calculates households' sensitivity to interest rates by increasing the mortgage rate to see how many households would have a deficit in their monthly calculation. FI's standardised costs are used in the stress tests. The interest rate expenses are estimated using the households' total debt, and not just mortgages, since other interest rates increase at the same time as the mortgage interest rates. Even fixed interest rates are assumed to increase in the same way. 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 economic scenario, households make their interest rate and amortisation payments. FI therefore assumes in its estimates that amortisation payments are included. The analysis is supplemented with a scenario where temporary reprieve from the amortisation payments is granted.

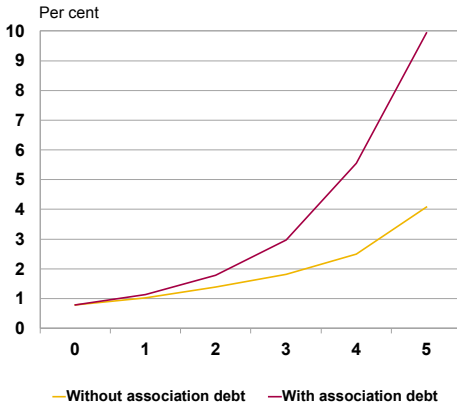
The percentage of households with new mortgages that have a deficit given a certain interest rate has decreased since 2017 (Diagram 29). This applies primarily at the higher applied interest rate of 7 per cent; just over 5 per cent of households experience a deficit in their monthly budget. The debts of these households also equal 5.9 per cent of the total lending volume. At the actual interest rate, 1 per cent of households experience a deficit. The percentage of households with a deficit at an interest rate of 7 per cent is highest in the age group 65+. There is also an over-representation of households with a high loan-to-income ratio among those that have a deficit given a stressed interest

25 Banks also take into account in their credit assessments the indirect household debt from the tenant-owner associations. One of the banks states in the mortgage survey that it always stresses the fee to the association through an increase in the interest rate. Three banks stress the fee if the association's debt exceeds a certain benchmark. One of the benchmarks that is used is that the association's debt should not be larger than 9,000–10,000 SEK/m².

26 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.

27 The assumption that interest rate increases have a direct effect on monthly rent is conservative. Many associations probably have sufficiently strong cash flows and therefore will not need to increase the rate following small increases in the interest rate. It is also possible that some associations will choose to reduce their investments and maintenance of the property instead of raising the fee when interest rate payments increase.

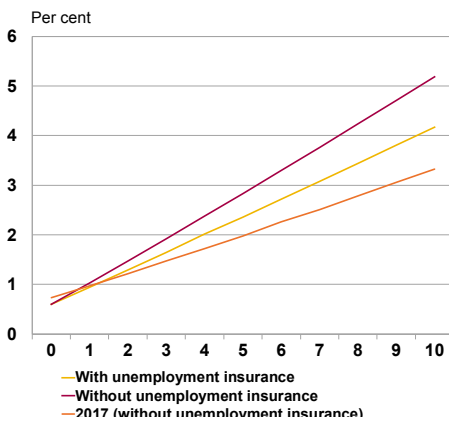
31. Percentage of tenant-owners with a deficit following an increase in the interest rate if the association's debt is included, with amortisation payments, new loans



Source: Mortgage survey, sample of new loans.

Note: The calculations are based on the agreed amortisation schedule.

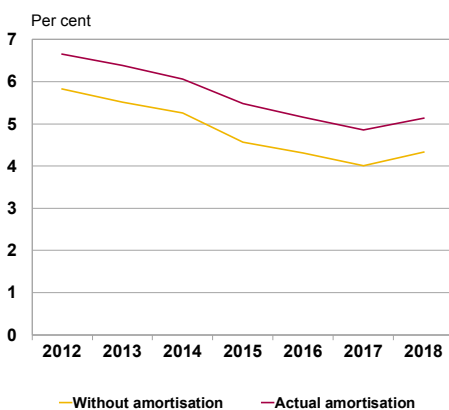
32. Percentage of households with a deficit if unemployment increases by 1 to 10 per cent, new loans



Source: Mortgage survey, sample of new loans.

Note: The calculations are based on the agreed amortisation schedule.

33. Percentage of households with a deficit given an increase in unemployment of 10 per cent



Source: Mortgage survey, sample of new loans.

rate of 7 per cent. This is natural since the loan-to-income ratio demonstrates the borrower's degree of sensitivity to interest rates.

The general trend is that the percentage of households with small margins has decreased since 2015, even though new mortgagors on average have borrowed noticeably less in relation to their income during this period. There is still a low percentage that experiences a deficit at higher interest rates. Good margins indicate that households are 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 its monthly payment may temporarily be smaller. An assumption of waived amortisation payments results in a percentage of new mortgagors with a deficit at a 7 per cent interest rate that is 2.6 percentage points lower, 2.3 per cent instead of just over 5 per cent (Diagram 30). The difference between the percentage of households that have a deficit with and without amortisation has increased slightly over time. This is because the size of the households' amortisation payments has increased. When households amortise more, there will be a negative short-term effect on their cash flow, which makes them more sensitive to interest rates. However, they also become increasingly resilient when they receive temporary reprieve from making amortisation payments. Compared to the 2017 survey, the changes in the households that experience a deficit with and without amortisation payments were negligible.

The debt of tenant-owner associations affects households that live in a tenant-owned apartment. When an association's interest rate goes up, it may need to raise the association fees. In FI's calculations, if the interest rate increases by 5 percentage points²⁸, just over 4 per cent of the tenant-owners will experience a deficit (Diagram 31). If the entire increase in the association's interest rate payments is transferred to the tenant-owners, the percentage with a deficit will rise to more than 10 per cent.²⁹ This was lower than in the 2017 survey, when corresponding figures with a deficit were 6 and 12 per cent, respectively.

Unemployment

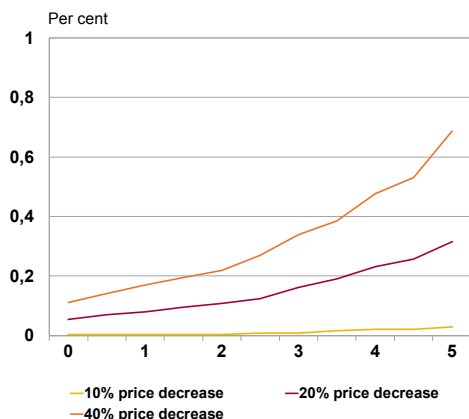
Unemployment lowers household income. Households that do not have unemployment insurance would be hit particularly hard. FI analyses households' ability to handle interest rate payments and other expenses if more households were to become unemployed and borrowers were to lose income.

In its stress test, FI assumes that 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 from making amortisation

²⁸ An interest rate increment of 5 per cent corresponds on average to an interest rate of 6.6 per cent. This means that the results are not fully comparable to estimated interest rate sensitivity for all new mortgagors.

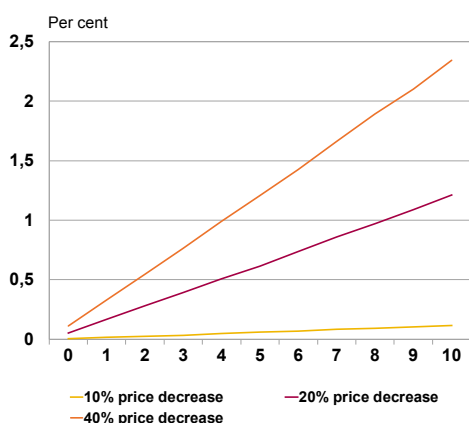
²⁹ Tenant-owner associations often have fixed interest rates. This means that it will take longer for interest rate increases to have a full impact on the associations.

34. Higher interest rate combined with a drop in house prices: Percentage of households with a deficit and negative equity



Source: Mortgage survey, sample of new loans.

35. Higher unemployment combined with a drop in house prices: Percentage of households with a deficit and negative equity, new loans



Source: Mortgage survey, sample of new loans.

payments while they are unemployed. FI conducts two calculations. The first assumes that two-thirds of households are connected to a private unemployment insurance; the remaining one-third is assumed not to have unemployment insurance. FI assumes that households without private unemployment insurance receive state unemployment insurance and then estimates how many households will experience a deficit.

In the 2018 survey, almost 4.2 per cent of the households will experience a deficit in their monthly budget calculation if 10 per cent of the borrowers became unemployed (Diagram 32). If none of the borrowers have private unemployment insurance, the percentage with a deficit would be around 5.2 per cent. More households experienced a deficit from a loss of income due to unemployment in the 2018 survey than in the 2017 survey. The percentage of households with a deficit in the same categories was one percentage point higher last year. The percentage of households with a deficit in the 2018 survey was at approximately the same level as in the 2016 survey (Diagram 33). The increase in the number of households experiencing a deficit indicates somewhat impaired resilience to unemployment.

Fall in house prices in combination with higher interest rates or unemployment

FI also combines interest rate increases or higher unemployment with a fall in house prices. This analysis shows the percentage of households with debt after they have sold their home due to a deterioration in their repayment ability. It should be noted that households in practice are also able to adapt in ways other than selling their homes if their economic situation changes. For example, they may choose to reduce their consumption if this is possible.

If FI assumes that the interest rate increases by 5 percentage points at the same time that house prices fall by 40 per cent, around 0.70 per cent of the new mortgagors would then experience a deficit and negative equity (Diagram 34).³⁰ This is lower than in both the 2016 and 2017 surveys. If FI instead assumes that house prices fall by 40 per cent and 10 per cent of households with new mortgages become unemployed, 2.3 per cent of the households would experience a deficit and negative equity at the same time (Diagram 35). In the 2016 and 2017 surveys, the corresponding figures were 1.7 and 2.5 per cent, respectively.

RESILIENCE OF HOUSEHOLDS STILL SOUND

In total, FI's stress tests show that household resilience has improved since the 2013 survey. Resilience has improved in particular since the 2015 survey. Compared to the survey in 2017, fewer households in the 2018 survey experienced a deficit between income and expenses at a higher interest rate level. A slightly larger number of households experienced a deficit in the 2018 survey given a loss of income due to unemployment. This increase can be explained by the short-term effect of larger amortisation payments.

³⁰ The calculations refer to the given shock. If other shocks occur, the results will change. Such a scenario is not analysed in this report.

Currently, most of the households with new mortgages have sufficient buffers to handle higher debt service payments even in the event of higher interest rates, higher unemployment or a fall in house prices. Even in the event of severe stress, few households experience problems with their debt service payments. The fact that, if necessary, households are able to get a reprieve from amortisation payments improves the resilience of households. The increase in resilience from the potential reprieve has increased as amortisation payments have increased.

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

	2018	2017	Swedish Consumer Agency 2018
Subsistence costs			
1 adult	9,700	9,500	6,910
2 adults	16,800	16,400	11,970
per child	3,600	3,500	3,110
Operating expenses			
Single-family homes	3,900	3,800	
Tenant-owned apartments	3,100	3,100	
Holiday homes	1,900	1,900	

The standardised costs in the table are extrapolated by an average of the standardised costs stated by the banks for 2015. The estimates use CPIF. To the right are the standardised costs for 2017 that were used in the report for 2017. 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.

Appendix 2 – Households with new mortgages. Correlation between loan-to-value ratio and loan-to-income ratio, correlation between loans and interest rate level

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

Figure B2.1. Sample from the 2018 mortgage survey. Correlation between loan-to-value ratio and loan-to-income ratio, gross income, new loans

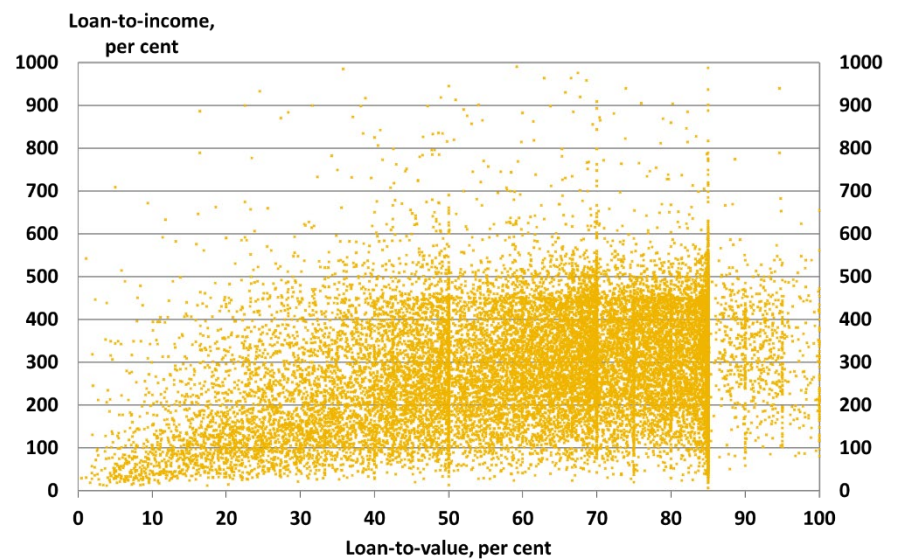
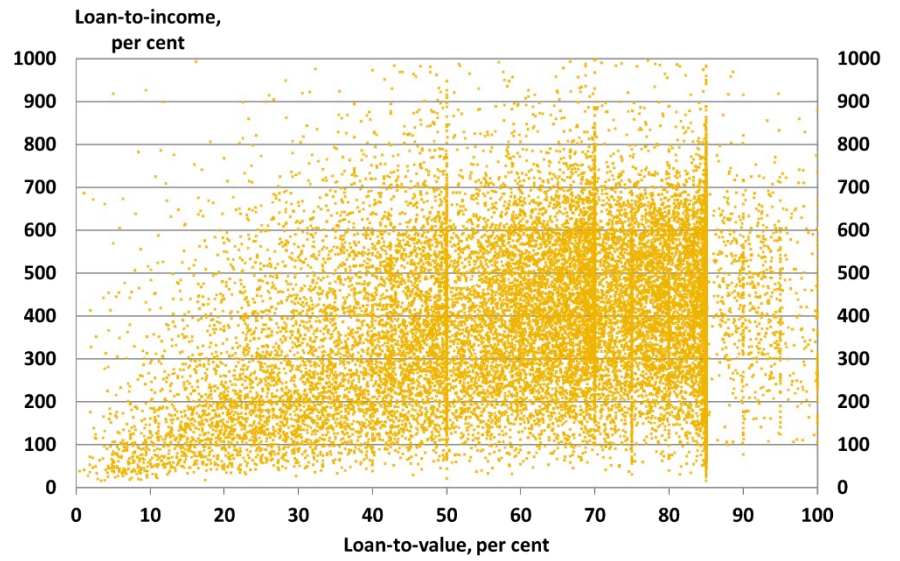


Figure B2.2. Sample from the 2018 mortgage survey. Correlation between loan-to-value ratio and loan-to-income ratio, net income, new loans





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