FI Analysis

Fewer home equity withdrawals after amortisation requirements

No. 20
28 November 2019

Ted Aranki and Henrik Larsson *

The authors work at the Economic Analysis Office at FI.

The FI Analysis series is presented at internal seminars at FI. The reports are approved for publication by an Editors' Board.

*The authors thank Michael Andersson, Henrik Braconier, Maria Feldt, Karl Hjert, Lars Hörngren, Klas Granlund, Niclas Olsén Ingefeldt, Karin Lindell, Magnus Karlsson, Megan Owens, Stefan Palmqvist and Viktor Thell for valuable feedback.

Summary

Home equity withdrawals constitute a large portion of the new mortgages issued in Sweden. However, the amortisation requirements have reduced household demand for these types of withdrawals. This change is most evident following FI's first amortisation requirement, which entered into force in 2016. Fewer households that have large existing mortgages withdrew equity, and those that do withdrew a smaller amount after the requirement went into effect. In addition, home equity withdrawers are affected more by the amortisation requirements than home buyers. The stricter amortisation requirement from 2018 has an impact on significantly fewer new mortgagors, and of these the ones that withdrew equity are affected only to a limited extent.

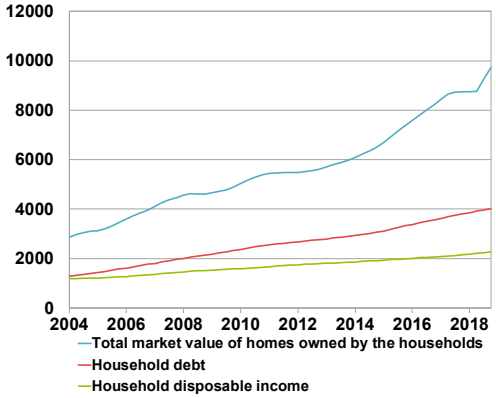
A large credit supply, a long period of low interest rates, and rising house prices have meant that households have faced favourable conditions for home equity withdrawals. Extensive home equity withdrawal from existing homes can be associated with macroeconomic risks. This is true in particular if households use the withdrawn equity to finance consumption. The decrease in demand for home equity withdrawals following the amortisation requirements has meant that there are fewer mortgagors with high debt. This indicates that fewer households are using mortgages to finance something other than the purchase of a home.

Finansinspektionen
+46 8,408,980 00
finansinspektionen@fi.se
www.fi.se

FI Ref.: 19-25227

Diagram 1. Total of household housing assets, debt and income

SEK billion



Source: FI and Statistics Sweden.

Note: Household assets in tenant-owned housing were obtained from Sparbarometern (Statistics Sweden). Household assets in single-family homes have been calculated using FI's own method. Total market value for homes is the sum of assets in single-family homes and tenant-owned housing. The sharp increase in the value of homes in 2018 is attributable to the increase of almost 30 per cent in the tax assessment value of single-family homes.

Home equity withdrawals can affect household resilience

Finansinspektionen (FI) analyses housing market and household debt developments on an ongoing basis. FI's mortgage survey, which is presented in FI's report *The Swedish Mortgage Market*, is an important part of this work. The survey monitors, for example, how much new mortgagors are borrowing. New mortgagors often borrow money for different reasons. Some borrow to buy a home, while others withdraw equity from an existing home.

Home equity withdrawal allows a household to transform a fixed asset in the form of built-up equity in the home into liquid assets without having to sell the home. The equity from the withdrawal can then be used for a number of different purposes, such as home renovation, replacing loans with less beneficial terms, financial investments, financing self-employment, financing the purchase of a home for a child, buying a second home, or financing consumption.[1]

The favourable macroeconomic environment in recent years has made it more possible for households to withdraw equity from their homes. House prices in Sweden have increased significantly faster than household income and debt (Diagram 1). Housing assets that are not collateralised can be used for home equity withdrawal.[2] Increases in house prices have thus increased the capacity for home equity withdrawals on existing homes. Falling interest rates have also made it cheaper to borrow money.[3] Emanuelsson et al. (2018) finds that almost one-third of the increase in household mortgages in Sweden during the period 2011–2017 can be attributed to home equity withdrawals.

How households use their withdrawn equity affects their resilience and in the long run can also affect financial and macroeconomic stability. For example, households that withdraw equity from their home to eliminate loans with less favourable terms are reducing their future interest costs. This make them less vulnerable. Households that borrow to invest (in real or financial assets) become more exposed to price changes. This can impair their resilience in the event of a shock if asset prices depreciate at the same time as the debt stays the same. Households borrowing to finance consumption only increase their debt, which decreases their resilience.

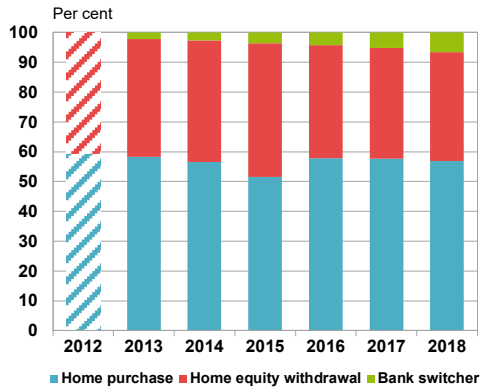
Households with a lot of debt are more exposed to a macroeconomic shock. The financial crisis in 2008–2009 shows that home equity

1 For example, Li and Zhang (2017) show that Swedish households use home equity withdrawals to pay off more expensive consumption loans and finance a sole proprietorship. Kessel et al. (2018) finds that Swedish households that increase their consumption after an increase in house prices do so primarily through home equity withdrawal.

2 The mortgage cap, which entered into force in 2010, specifies that new mortgagors may only borrow against at the most 85 per cent of the market value of their home.

3 Even if rising house prices and falling interest rate costs have made it more beneficial to withdraw equity from a home, there are other opposing factors. For example, the amortisation requirements limit the amount that households can borrow. Changes in the possibilities for using the ROT tax deduction also probably affect the demand for home equity withdrawal. In 2016, this tax deduction was reduced by almost 50 per cent. Demand for home equity withdrawal can have both increased and decreased due to changes to the ROT tax deduction.

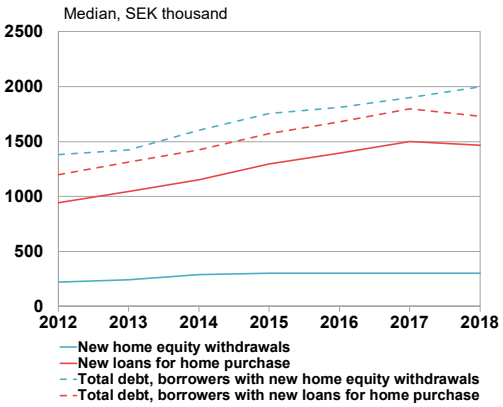
Diagram 2. Distribution of new mortgages



Source: FI.

Note: Distribution of new loans. The bar for 2012 is not solid since there is no data about which customers switched banks. The data for the years 2013–2016 contains information about which customers switched banks for four of the eight banks. The data for 2017 contains information about which customers switched banks for seven of the eight banks. The data for 2018 contains information about which customers switched banks for all banks.

Diagram 3. New mortgages and total debt for new mortgagors



Source: FI.

Note: Total debt includes all mortgages and consumption loans of new mortgagors as well as any student loans.

withdrawals can increase household debt, leading to lower consumption if house prices fall.[4] A drop in consumption linked to home equity withdrawal is particularly well-documented when the equity is used to finance consumption. In Denmark and the UK, it was primarily the households that withdrew equity to finance consumption that reduced their consumption during the crisis.[5] Analyses from Norway, the UK and the USA indicate that 20–30 per cent of home equity withdrawals are used for consumption.[6] The extent to which home equity withdrawals are used in Sweden to finance consumption is not known since this type of information is not gathered.

Using data from FI's mortgage survey, we can distinguish between new mortgagors who borrow to buy a home from those who are withdrawing equity from their existing home.[7] In this FI Analysis, we focus on households that are withdrawing equity from their home and evaluate how they have been impacted by FI's amortisation requirements. We estimate the impact of both the first amortisation requirement and the stricter amortisation requirement on the size of the withdrawals made by these new mortgagors. We use FI's mortgage surveys from the period 2012–2018 in the analysis. This means that the data includes periods both before and after the amortisation requirements went into effect. Like in previous analyses, we use the difference-in-difference approach to estimate the effects of the amortisation requirements.[8]

Scope of home equity withdrawal

Using the data from the mortgage survey, we can divide the new mortgagors into groups. We define *home equity withdrawers* as households that take out a second mortgage on their home and households that take out a first mortgage on their previously unmortgaged home.[9] If the new mortgage constitutes the only loan on the home, we instead consider this household a *home buyer*.[10] Households that move a loan from one bank to another are called *switchers*.

4 See Andersen, et al. (2016), Bunn and Rostom (2015), Mian et al. (2013) and Svensson (2019).

5 See Andersen et al. (2016) regarding Denmark and Bunn and Rostom (2015) for the UK.

6 Almaas et al. (2015) shows with data from a Norwegian survey that 32 per cent of the home equity loans in Norway are used for consumption of durables. Data from surveys in the UK and the USA show that around 20 per cent of home equity loans are used to finance consumption: Davey (2001), Brady et al. (2000), Canner et al. (2002), and Mian and Sufi (2009).

7 FI's mortgage survey does not contain information about the purpose of the loan application.

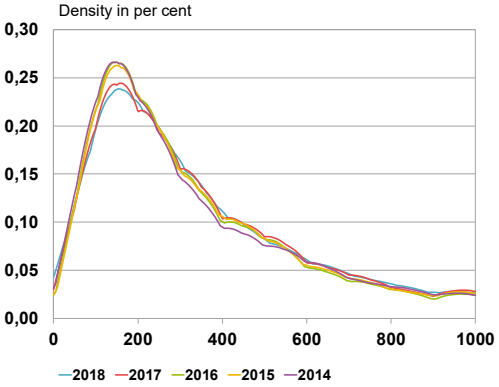
8 See Finansinspektionen (2017), Andersson et al. (2018) and Andersson and Aranki (2019).

9 The group *home equity withdrawers* includes other definitions, but they only have a marginal effect. We check that the home equity withdrawal does not exceed 85 per cent of the total mortgage. We also check whether the household took out an unsecured loan in conjunction with the home equity withdrawal and ensure that the home being purchased is not a newly produced home. These households are excluded from the group.

10 *Home buyers* also include households purchasing a holiday home. However, if a household withdraws the built-up equity in an existing home to buy a holiday home, this household is grouped under *home equity withdrawers*.

Diagram 4. Distribution of new home equity withdrawals

Density in per cent

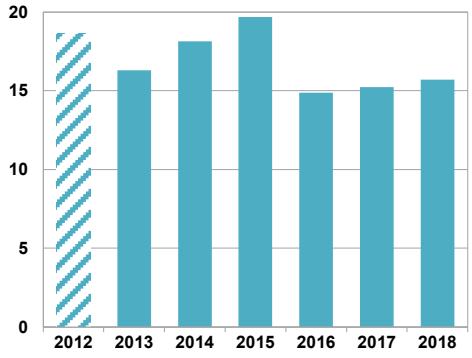


Source: FI.

Note: The diagram shows the distribution of new home equity withdrawal in SEK thousand. SEK thousand on the X axis.

Diagram 5. Home equity withdrawals (volume) as percentage of new mortgages

Per cent



Source: FI.

Note: There is no data on new loans for switchers in 2012. Therefore, switchers might also be included in the striped bar. This means that the volume of home equity withdrawals in 2012 is overestimated.

Diagram 6. New borrowers broken down by age and loan purpose

Per cent

Source: FI.

HOME EQUITY WITHDRAWALS REPRESENT A LARGE PERCENTAGE OF NEW MORTGAGES

The share of home equity withdrawals increased steadily between 2012 and 2015 (Diagram 2). In 2015, 42 per cent of new mortgages were home equity withdrawals. This share then decreased starting in 2016, and in 2018 36 per cent of all new mortgages were home equity withdrawals.

New home equity withdrawals on average are significantly smaller than loans taken to buy a home. Their median was around SEK 300,000 in 2018 (Diagram 3). Unlike the size of loans taken to buy a home, the size of the home equity withdrawal has not changed much over time. Even the distribution of mortgagors' new home equity withdrawals in terms of the size of the loan has basically been the same since 2014 (Diagram 4). In contrast, new mortgages to buy a home have increased as house prices increased.

Even though new home buyers borrow more to buy a home, their total debt (mortgages and other loans) is smaller than the debt of home equity withdrawers (Diagram 3). This applies even if we consider differences in the borrowers' characteristics (such as income, age, family composition and region).[11] The fact that the total debt of home equity withdrawers is larger than for home buyers, coupled with the relative constant size of the new home equity withdrawals over time, indicates that these households have withdrawn the equity from their home as it has accrued.

After FI tightened the amortisation requirement in 2018, new mortgages and total debt for home buyers decreased (Diagram 3). However, the total debt for home equity withdrawers continued to increase.

The volume of home equity withdrawals as a percentage of new mortgages amounted to around 18 per cent between 2012 and 2015 (Diagram 5). After the first amortisation requirement in 2016, this percentage fell, and in 2018 it was approximately 16 per cent.

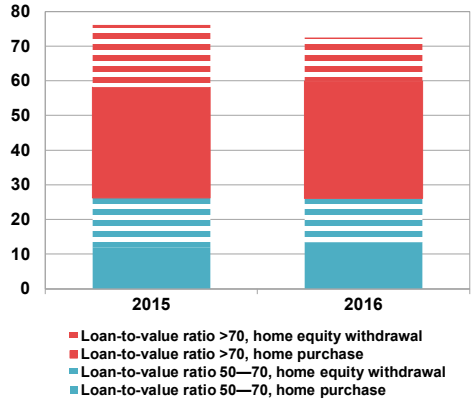
Few young households (ages 18–30) withdraw equity from their home, but they represent a large share of the new loans intended for home acquisitions. Almost 30 per cent of new loans used to buy a home in 2018 were taken out by young households, but this group only made 7 per cent of the home equity withdrawals (Diagram 6). The group that made the most equity withdrawals was the age group 31–50. New home equity withdrawers are on average older than home buyers. Older households are more likely than younger households to withdraw equity because they often have more built-up equity from previous price increases and amortisation payments.[12]

11 A regression model of the total debt shows that home equity withdrawers on average (for the period 2012–2018) have debt that is 1.5 per cent higher than that of home buyers. In the model, we control for income, age, family composition and region. The fact that home equity withdrawers have more debt than home buyers even though the average new home equity withdrawal is small relative to the purchase of the home is because households choose to withdraw the equity from their home on multiple occasions over time.

12 See Finansinspektionen (2019) for a more detailed description of how loan-to-value ratios differ by age.

Diagram 7. Share of new mortgagors with a loan-to-value ratio of more than 50 per cent

Per cent

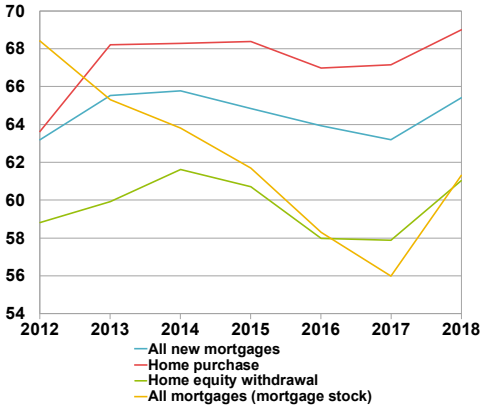


Source: FI.

Note: The diagram shows the share of new mortgagors with a loan-to-value ratio of more than 50 per cent broken down by loan-to-value ratio and loan purpose.

Diagram 8. Loan-to-value ratio for mortgagors by loan purpose

Per cent



Source: FI.

Note: The loan-to-value ratio for all mortgages refers to the aggregate mortgage stock.

Home equity withdrawal and amortisation requirements

The first amortisation requirement (AR1) that FI introduced in 2016 is based on the loan-to-value ratio of the home.[13] The stricter amortisation requirement (AR2) that FI introduced in 2018 is based on the loan-to-income ratio of the household (the household's total mortgage in relation to pre-tax income).[14] When equity is withdrawn from a home, the entire mortgage must be amortised in accordance with the amortisation requirements if the loan-to-value ratio or the loan-to-income ratio is higher than the thresholds specified in the requirements. A home equity withdrawal can also be amortised in accordance with the alternative rule.[15] For some households, the amortisation requirements reduce the incentives and possibilities to withdraw equity from the home. For example, the running costs for the withdrawal increase due to the increase in the size of amortisation payments. Both amortisation requirements reduce the amount of equity that can be withdrawn through the discretionary income calculation.[16]

LOWER LOAN-TO-VALUE RATIOS FOR HOME EQUITY WITHDRAWERS AFTER AR1

The percentage of new mortgagors with a loan-to-value ratio of more than 50 per cent decreased slightly after the introduction of AR1 (Diagram 7). This decrease is due in its entirety to the decrease in the share of home equity withdrawals. The percentage of home equity withdrawals made by mortgagors with a loan-to-value ratio above 70 per cent decreased the most.

The average loan-to-value ratio for new home equity withdrawers is lower than the average for new home buyers (Diagram 8).[17] The percentage of new home equity withdrawers with high loan-to-value ratios decreased in 2016 and contributed to the decrease in the average loan-to-value ratio for home equity withdrawers. In turn, this lowered the average loan-to-value ratio for all new mortgagors.

New home equity withdrawers increased their loan-to-value ratios by on average almost 17 per cent by withdrawing equity from their home.[18] This means that these mortgagors had a lower loan-to-value

13 At least 1 per cent of a loan's original value must be amortised annually if the loan-to-value ratio is greater than 50 per cent. At least 2 per cent of a loan's original value must be amortised annually if the loan-to-value ratio is greater than 70 per cent (FFFS 2016:16).

14 At least 1 per cent of a loan's original value must be amortised annually in addition to the amortisation payments from the first amortisation requirement if the loan-to-income ratio is greater than 450 per cent (FFFS 2017:23).

15 The alternative amortisation rule (section 8 of FFFS 2017:23) allows banks to grant an exemption from the amortisation requirements for home equity withdrawals made prior to 1 March 2018. Under the alternative rule, the borrower amortises on an annual basis at least 10 per cent of the withdrawn equity instead of amortising the entire mortgage in accordance with the amortisation requirements.

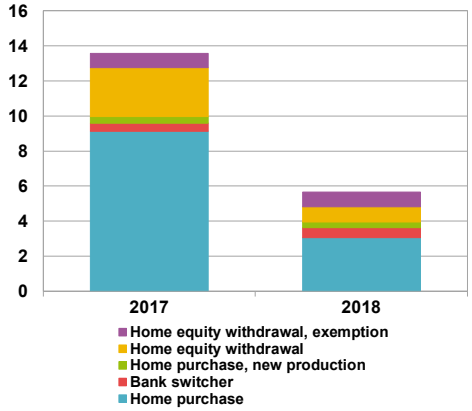
16 Higher amortisation payments affect the costs in the discretionary income calculation and thus reduce the amount of equity that can be withdrawn in relation to income.

17 The loan-to-value ratios of home equity withdrawers are on average approximately 5 percentage points lower than if we consider differences in borrowers' characteristics (see Footnote 12).

18 This increase has been relatively constant over time.

Diagram 9. Share of new mortgagors with a loan-to-income ratio of more than 450 per cent by loan purpose

Per cent



Source: FI.

Note: The loan-to-income ratio is defined as total mortgages in relation to pre-tax income.

ratio on average for all mortgages (the mortgage stock) before they withdrew equity from their home (Diagram 8).

FEWER HOME EQUITY WITHDRAWALS LEAD TO LOWER PERCENTAGE WITH HIGH LOAN-TO-INCOME RATIO

The percentage of new mortgagors with a loan-to-income ratio of more than 450 per cent decreased by half after the introduction of AR2 (Diagram 9). The percentage of new home equity withdrawers that have a loan-to-income ratio of more than 450 per cent in 2018 decreased by more than two-thirds compared to the previous year. This means that home equity withdrawers contributed to around one-fourth of the total decrease. The percentage of home buyers with a high loan-to-income ratio also fell sharply.

Just over one-third of the new mortgagors with a loan-to-income ratio of more than 450 per cent used one of the easements in the amortisation requirements. These easements include the alternative rule for home equity withdrawal, amortisation exemption when purchasing a newly produced home, and unchanged amortisation terms when switching banks. The alternative rule went into effect in 2016 when FI introduced the first amortisation requirement. Information about households that use the alternative rule are only included in the mortgage survey starting in 2017. Around 30 per cent of the households with a loan-to-income ratio of more than 450 per cent in 2018 were home equity withdrawers. Of these, approximately half use the alternative amortisation rule.

Estimated effects of the amortisation requirements on home equity withdrawal and loans to buy homes

We use the difference-in-difference method in the same way it was used in previous analyses of the amortisation requirements in Finansinspektionen (2017) and Andersson and Aranki (2019). This method makes it possible to estimate the effect of the amortisation requirements by comparing the development between those affected by the measures (subject group) and those not affected (control group).[19]

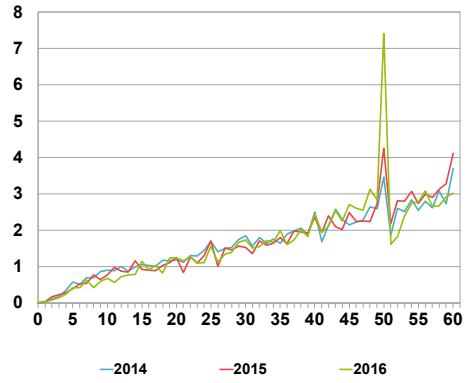
We estimate the direct effects of the amortisation requirements on the intensive margin (i.e. how much the households borrows, given that they are borrowing). There are grounds to expect that even the extensive margin (i.e. whether or not the household borrows) is sensitive to the amortisation requirements. For example, some households may have chosen not to borrow any money because of the requirements. However, we cannot study these effects since these households are not included in the mortgage survey.

We measure the effect of the requirements on households' new and total mortgages. *New mortgages* are strictly new loans and refer only to the mortgages the household took out at the time the loan was granted, i.e. the home equity withdrawal for new home equity

19 The method eliminates factors that affect both groups, for example changed conditions for the ROT tax deduction. The differences between the groups can therefore be interpreted as a causal effect of the reform. This model is described in more detail in Finansinspektionen (2017).

Diagram 10. Distribution of new mortgagors' loan-to-value ratios

Per cent

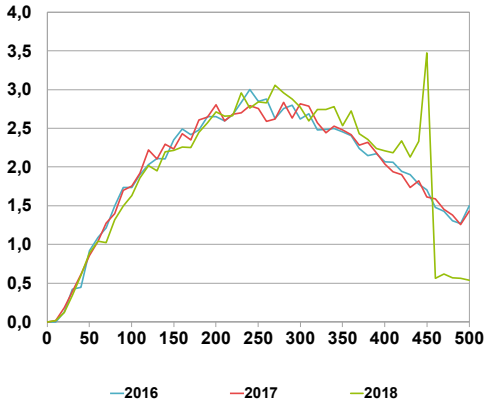


Source: FI.

Note: Distribution of new mortgagors' loan-to-value ratios up to and including 60 per cent. Loan-to-value ratios on the X axis. Share of borrowers with each loan-to-value ratio on the Y axis.

Diagram 11. Distribution of new mortgagors' loan-to-income ratios

Per cent



Source: FI.

Note: Distribution of new mortgagors' loan-to-income ratios up to and including 500 per cent. Loan-to-income ratios on the X axis. Share of borrowers with each loan-to-income ratio on the Y axis.

withdrawers and the new mortgage for home buyers. *Total mortgages* is defined as the total mortgages (new + existing) of new mortgagors. For home buyers, new loans and total mortgages are often the same. For home equity withdrawers, the new loan only constitutes a part of the household's total mortgages.

FI's amortisation requirements only apply to new mortgages. This means that the amortisation requirements should impact demand for new mortgages.[20] For home buyers, the total mortgage can also be adapted (since these loans are often identical). However, the amortisation requirements can also impact total mortgages for new home equity withdrawers, in part through a decrease in the size of the withdrawal but also through fewer households making a withdrawal. For example, fewer households choose to take out large new mortgages in relation to the value of the home or in relation to their income after the amortisation requirement (Diagrams 7 and 9). The term *total mortgages* therefore captures a total effect of the requirements including that some households declined to take out a new mortgage.[21]

In the estimates, we disregard new mortgagors that are subject to the amortisation exemptions due to the purchase of a newly produced home or a bank switch, but households that amortise in accordance with the alternative rule for home equity withdrawals are included in the analysis.[22]

Amortisation requirements resulted in many households at the threshold values

One of the requirements for the method is to identify borrowers (for the control groups) that are not affected by the reform. Many new mortgagors have chosen to borrow an amount that falls just under the limits for the amortisation requirements to reduce their amortisation payments. These borrowers have also been affected by the reforms and should therefore be included in the subject group. After AR1, the percentage of borrowers with a loan-to-value ratio just under the limit (50 per cent) increased sharply (Diagram 10). There was also a large percentage of households after AR2 that chose to borrow less in order to have a loan-to-income ratio of less than 450 per cent and therefore avoid amortising the extra percentage point in accordance with the requirement (Diagram 11).

Therefore, we define the control group for AR1 as new mortgagors with a loan-to-value ratio of up to 49 per cent. The corresponding definition for AR2 is new mortgagors with loan-to-income ratios of

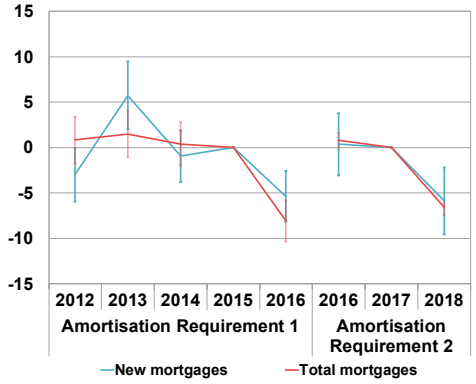
20 Supply is also affected by the amortisation requirements. For example, the banks' credit assessment can limit the amount the households may borrow to such an extent that the loan amount is not granted.

21 Fewer new borrowers with a high level of debt means that the average total mortgage is decreasing.

22 New mortgagors that are subject to exemption due the purchase of a newly produced home or bank switch are not affected by the amortisation requirements, but households that amortise in accordance with the alternative rule for home equity withdrawals are affected by the reform. The banks can give the possibility of amortisation in accordance with the original amortisation requirements or the alternative rule for home equity withdrawals. The results in the analysis are approximately the same if we also disregard those amortising in accordance with the alternative rule for home equity withdrawals.

Diagram 12. Test of parallel trends

Per cent

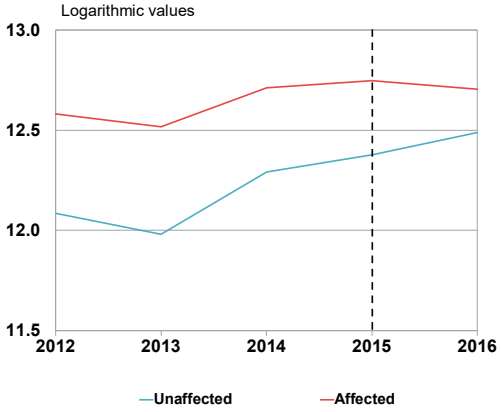


Source: FI.

Note: The diagram shows if the development for total mortgages and new loans differs between those affected and the control group both before and after each respective reform. When the confidence interval includes zero, the difference between the groups (and relative to the year before FI introduced each amortisation requirement) is not statistically significant at 5 per cent.

Diagram 13. New mortgages for different groups of home equity withdrawers

Logarithmic values



Source: FI.

Note: The diagram shows the logarithmic values of new mortgages for home equity withdrawers. "Affected" refers to the share of new mortgagors with a loan-to-value ratio of more than 49 per cent. "Unaffected" are all others. The dotted vertical line marks the time prior to when FI implemented the first amortisation requirement.

between 300 and 420 per cent. This is the same definition as Andersson and Aranki (2019).[23]

Test of parallel trends

A fundamental assumption for the method we use, beside that the control groups must not be affected by the regulations, is that both of the groups must have followed a similar development prior to the implementation of the regulations. If this assumption is met, we can estimate what the development would have been if FI had not introduced and tightened the amortisation requirement.

We test the (null) hypothesis that the average loans were the same – that the trends were parallel – in both groups prior to the amortisation requirement. Using data from 2012 to 2016, we test this hypothesis for AR1. In a corresponding test for AR2, we use data from 2016 to 2018. The data includes periods from both before and after the introduction of each amortisation requirement. We have selected the periods so that the estimations of each requirement are not affected by the other requirement. Our results are also comparable with Finansinspektionen (2017) and Andersson and Aranki (2019).

The results from our test show that we cannot reject the hypothesis of parallel trends before FI introduced each requirement (Diagram 12). The results are clearer for total mortgages than for new mortgages prior to AR1. The breakdown into those affected (subject group) and those not affected (control group) by AR1 shows that new mortgages developed in approximately the same way for home equity withdrawers prior to 2016 (Diagram 13). This means we can estimate difference-in-difference equations to calculate the impact of each requirement on mortgages and evaluate how the requirements affected new mortgagors' home equity withdrawals.

AMORTISATION REQUIREMENTS AFFECTED HOME EQUITY WITHDRAWALS

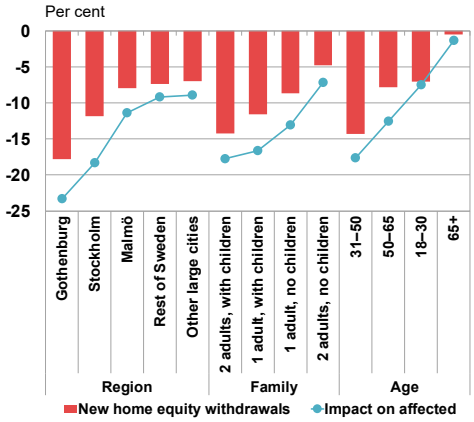
By estimating a difference-in-difference model, we can distinguish between the effect of the amortisation requirements and other factors that also could have an impact on the size of new mortgagors' loans. We can also analyse if there are any differences in how the amortisation requirement affects different groups of households. Table 1 shows the results from the model for how the amortisation requirements have affected new mortgagors' demand for loans (mortgages and new loans).[24] The coefficients should be interpreted as the decrease in percent in mortgages for households affected by each reform.

The model estimates show that the amortisation requirements affected the size of the loans taken by new mortgagors. AR1 entails that those affected on average borrowed 8 per cent less compared to if FI had not introduced the requirement (Table 1). New home equity withdrawers reduced their loans significantly more than house buyers following

23 The subject group consists of new mortgagors with a loan-to-income ratio of more than 420 per cent. The considerations underlying the definition are discussed in more detail in Andersson and Aranki (2019).

24 We also control in the model for other characteristics that could affect borrowers' demand for loans: income, volume-weighted interest rate, loan-to-value ratio, age, number of adults and number of children in the household, utilisation of unsecured loans, top loans, type of home and the region of domicile.

Diagram 14. Estimated impact on and slow-down in home equity withdrawals by household type



Source: FI.

Note: "Impact on affected" shows the estimated impact of the first amortisation requirement on different types of home equity withdrawers. "New home equity withdrawals" is the average decrease in the group and takes into account both the percentage of households affected and how large the impact has been on those that are affected.

AR1. The effect is approximately the same for both new mortgages and total mortgages. Following the amortisation requirement, home equity withdrawers reduced their new and total mortgages by just over 7 and 9 per cent, respectively, more than home buyers.[25]

AR2 does not appear to have had an impact on demand for new home equity withdrawals since the estimated effects are not statistically different from zero. However, the effect of this amortisation requirement is significant for home buyers. They reduced their new mortgages by almost 9 per cent. The effect on total mortgages is also significant. AR2 reduced the total mortgages of both home buyers and home equity withdrawers. The slow-down for all affected mortgagors is estimated to be almost 8 per cent.

Thus, AR2 does not appear to have had an impact on the size of the households' home equity withdrawals, although it has decreased the total mortgages for home equity withdrawers. This is probably because households with a high level of debt are less willing to make new equity withdrawals due to the requirement.

Table 1. Model estimate for the impact of the amortisation requirements on mortgages, broken down into home buyers and home equity withdrawers

Per cent and amount

	AR1		AR2	
	New mortgages	**Total mortgages**	**New mortgages**	**Total mortgages**
Affected	-8.03***	-8.04***	-6.39***	-7.76***
of which home buyers	-4.99***	-4.07***	-8.71***	-8.90***
of which home equity withdrawers	-12.2***	-13.5***	-2.30	-5.76***
R-squared	56.5	61.5	63.4	61.5
Observations	124,374	124,374	20,640	20,640

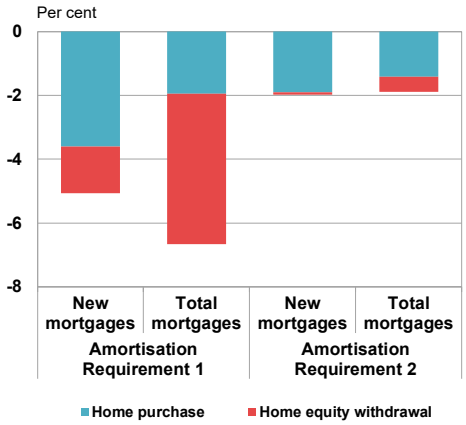
Note: *** indicates that the estimate is statistically different than zero at 5 per cent. The table shows only the difference-in-difference estimates, which indicate the impact of the amortisation requirements on new mortgagors who are affected. AR1 is estimated using data for the years 2012–2016. AR2 is estimated using data for the years 2017–2018.

Households in large cities reduce their home equity withdrawals the most.

The result shows that AR1 is primarily responsible for reducing demand for new home equity withdrawals. All household types are withdrawing less equity as a result of this requirement (Diagram 14). The impact was larger in Gothenburg and Stockholm than in other regions. This is probably because the withdrawal amounts were largest in the major cities since loan-to-value ratios were the lowest there. This in turn is because the prices in previous period increased the most. Mortgagors with children and in the age group 31–50 also significantly reduced their home equity withdrawals from a relative perspective.

25 These effects are achieved by calculating the difference between the estimate coefficients in Table 1 for affected home equity withdrawers and home buyers.

Diagram 15. Impact of amortisation requirements on mortgages by loan purpose



Source: FI.

Note: The diagram shows the change in per cent of mortgages and total mortgages as a result of the amortisation requirements. The aggregate impact has been calculated using the estimated impacts presented in Table 1.

HOME EQUITY WITHDRAWALS MAJOR FACTOR BEHIND DECREASE IN TOTAL MORTGAGES AFTER AR1

The total impact of a requirement depends on *how many* are affected and by *how much* they are affected. Our estimates show how much new mortgagors were impacted by the amortisation requirements, broken down into home buyers and home equity withdrawers (Table 1). The overall impact for all new mortgagors shows that the AR1 on average reduced new mortgages by just under 5 per cent and new mortgagors' total mortgages by almost 7 per cent (Diagram 15). The impact on total mortgages is somewhat larger than on new mortgages, potentially because several households with large mortgages chose to borrow less or not borrow at all following the requirement.

Finansinspektionen (2017) shows that the first amortisation requirement slowed new mortgagors' total mortgages in relation to income by almost 9 per cent. This is slightly higher than the estimates in this study. The differences are primarily due to our definition of the control group, which is new mortgagors with a loan-to-value ratio of up to 49 per cent, and because we disregard both those who are switching banks and those who are buying a newly produced home. The breakdown into home buyers and home equity withdrawers can also have had an impact.

A breakdown of the total impact between new home equity withdrawers and home buyers shows that home equity withdrawers contribute to a large portion of the total impact from AR1 (Diagram 15). Smaller new home equity withdrawals represent almost 30 per cent of the total slow-down in the new mortgages. The impact from home equity withdrawal is significantly larger for the total mortgages. This is because mortgages for home equity withdrawers constitute a significantly larger portion of total mortgages compared to the corresponding portion of new mortgages. But these results are also in line with new mortgagors affected by AR1 making small home equity withdrawals and that fewer households with high debt make home equity withdrawals.

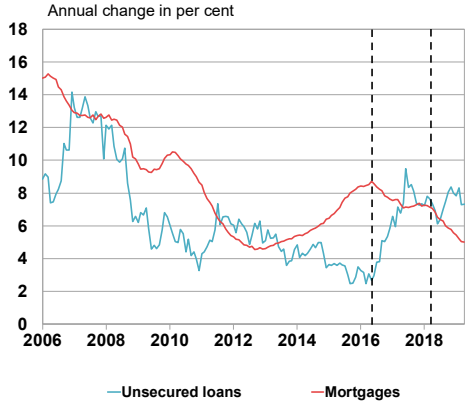
A majority of the slow-down in total mortgages is due to the changed behaviour of new home equity withdrawers. This can explain the results from Finansinspektionen (2017), which showed that the first amortisation requirement induced new mortgagors to adapt their mortgages three times as much as the price they paid for their home. And home equity withdrawers do not have a direct impact on demand for housing, which home buyers do.

AR2 impacted significantly fewer new mortgagors than AR1, and the total impact on mortgages is therefore limited.[26] In principle, the entire slow-down is attributable to new mortgagors borrowing to buy a home. This result is also in line with Andersson and Aranki (2019), who found that households with new mortgages adapted their demand for homes and mortgages more or less the same as a result of the stricter amortisation requirement.

26 New mortgagors borrow on average almost 2 per cent less due to AR2. These effects are in line with the results in Andersson and Aranki (2019).

Diagram 16. Household debt

Annual change in per cent



Source: Statistics Sweden.

Note: The dotted vertical lines indicate when FI introduced the amortisation requirements.

Amortisation requirements slow down willingness to withdraw equity

Due to a large credit supply, a long period of rising house prices, and falling interest rates, the conditions in Sweden for using a home as collateral to borrow money have been favourable for a number of years. We show that home equity withdrawals constitute a considerable portion of new mortgages and that this share increased following the introduction of the first amortisation requirement in 2016.

The amortisation requirements have reduced demand for home equity withdrawals. This has most probably slowed a development where households withdraw equity to finance something other than the purchase of a home, for example consumption. AR1 had the clearest impact. This requirement slowed total lending for home equity withdrawals by just over 9 per cent.[27] Many households with a lot of debt decided not to make a new home equity withdrawal after AR1. Others made smaller home equity withdrawals than what they would have otherwise made.

However, as home equity withdrawals decreased, unsecured loans increased (Diagram 16). This could indicate that part of the demand for loans moved from home equity withdrawal to unsecured loans after AR1.

This analysis shows that the tendency to use mortgages for purchases other than buying a home decreased following the amortisation requirements. This has probably resulted in a reduction of the vulnerability of these households, better equipping them to handle a fall in house prices or a loss of income.

27 This is a calculation of the total effect for all home equity withdrawers (affected and unaffected).

References

Almaas, S., Bystrøm, L., Carlsen, F., and Xunhua, S. (2015), "Home Equity-Based Refinancing and Household Financial Difficulties: The Case of Norway", *Working Paper*, available at SSRN 2523025.

Andersen, A.L., Duus, C., and Jensen, T.L. (2016), "Household debt and spending during the financial crisis: Evidence from Danish micro data", *European Economic Review 89*, 96–115.

Andersson, M., Aranki, T., Gjirja, M., and Olsén Ingefeldt, N. (2018), "The mortgage cap reduced household debt", *FI Analysis 12*, Finansinspektionen.

Andersson, M., and Aranki, T. (2019), "Fewer vulnerable households after the stricter amortisation requirement", *FI Analysis 17*, Finansinspektionen.

Brady, P. J., Canner, G. B., and Maki, D. M. (2000), "The effects of recent mortgage refinancing", *Fed. Res. Bull*., 86:441.

Bunn, P., and Rostom, M. (2015), "Household debt and spending", *Working Paper No 554*, Bank of England.

Canner, G., Dynan, K., and Passmore, W. (2002), "Mortgage refinancing in 2001 and early 2002", *Fed. Res. Bull*., 88:469.

Davey, M. (2001), "Mortgage equity withdrawal and consumption", Bank of England *Quarterly Bulletin*, Spring.

Emanuelsson, R., Katinic, G., and Spector, E. (2018), "Developments in the housing market and their effect on household debt". *Economic Commentaries No. 14*, Sveriges Riksbank.

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

Finansinspektionen (2019), "The Swedish Mortgage Market".

Kessel, D., Tyrefors, B., and Vestman, R. (2018), "The Housing Wealth Effect: Quasi Experimental Evidence", *Working Paper No 361*, Sveriges Riksbank.

Li, J., and Zhang, X. (2017), "House prices, home equity, and personal debt composition". *Working Paper No 343,* Sveriges Riksbank.

Mian, A.R., and Sufi, A. (2009), "House prices, home equity-based borrowing, and the U.S. household leverage crisis". *NBER Working Paper No 15283.*

Mian, A.R., Kamalesh, R and Sufi, A. (2013), "Household Balance Sheets, Consumption, and the Economic Slump". *Quarterly Journal of Economics 128(4).*

Svensson, Lars E.O. (2019), “Housing Prices, Household Debt, and Macro-economic Risk: Problems of Macroprudential Policy I”, *Working Paper,* Stockholm School of Economics, CEPR and NBER.