FI Analysis No. 34

Temporary amortisation exemption led to larger mortgages

By: **Michael K. Andersson and Ted Aranki ***

Summary

The amortisation requirements have led to households borrowing less. In April 2020, FI gave the banks the option of offering all new and existing mortgage borrowers a temporary exemption from these amortisation requirements following the spread of the coronavirus and its impact on the Swedish economy. This exemption enabled mortgage borrowers a break from their amortisation payments until 31 August 2021. The aim was to give borrowers greater financial flexibility during the crisis.

Approximately 12 per cent of Sweden's mortgage borrowers used the exemption. In this analysis, we have only studied new borrowers and how they were impacted by the temporary exemption. There is greater uncertainty in our estimates than normally because of the turbulent economic situation during the coronavirus pandemic.

It was primarily new mortgage borrowers who borrow large amounts (and who therefore make high amortisation payments) who decided to use the exemption. Our analysis points towards that the exemption resulted in new mortgage borrowers borrowing almost 4 per cent more and buying houses that were approximately 1 per cent more expensive. Loans increasing more than prices suggests that new mortgage borrowers used the exemption for more than buying more expensive houses, such as financing a greater share of their house with a mortgage, increasing their savings, consuming more or carrying out renovations.

It was home buyers, particularly those with higher incomes, who borrowed more and bought more expensive houses. Although young borrowers did not change their behaviour as a result of the exemption, older borrowers borrowed more. Mortgage borrowers between the ages of 30 and 65 also bought more expensive houses, although the oldest age group did not.

30 juni 2021, FI Ref. 21-16537

* The authors would like to thank Johan Almenberg, Susanne Andersson, Henrik Braconier, Magnus Karlsson, Niclas Olsén Ingefeldt, Lars Hörngren, Jonas Opperud, Megan Owens, Stefan Palmqvist, Nicklas Rehnby and Viktor Thell.

Optional amortisation exemption

In recent years Finansinspektionen (FI) has introduced amortisation requirements for households with large loans in order to reduce risks associated with household debt. The first requirement, which was introduced in 2016, stated that households that borrow more than half the value of their house must amortise at least 1 per cent of the original mortgage every year. Households that borrow more than 70 per cent of the value must amortise at least 2 per cent. The stricter requirement from 2018 means that households that borrow more than 4.5 times their annual income before tax must amortise an additional 1 per cent over and above the first requirement.

These amortisation requirements have resulted in new mortgage borrowers buying cheaper houses and borrowing less (see Finansinspektionen, 2017, Andersson and Aranki, 2019 and Aranki and Larsson, 2019). In addition, FI assesses that household resilience will increase over time as amortisation payments reduce their mortgages.

Although these amortisation payments reduce mortgages, the borrowers' cash flows will initially be worse than if they did not amortise. The regulations therefore allow lenders to grant temporary exemptions from amortisation payments in specific circumstances, for example, if the borrower loses their job. FI expanded these specific circumstances in 2020 to include extraordinary events that cause a sharp decline in the Swedish economy. In the event of major economic uncertainty, households may have a greater need for liquid assets or would like to increase their savings buffer so that they can cope with any future loss of income. In this scenario, an amortisation exemption can benefit both existing and new mortgage borrowers.

As a result of the coronavirus pandemic, FI produced new general guidelines in 2020, allowing banks to grant all new and existing mortgage borrowers an exemption from the amortisation requirements until 31 August 2021 (see Finansinspektionen, 2020). The exemption did not in itself offer new mortgage borrowers greater borrowing capacity, as banks still included amortisation as part of their credit assessments. However, borrowers could choose to borrow more and buy a more expensive house as the exemption lowered their loan payments and therefore improved their cash flow. This kind of behaviour can either be explained by some borrowers having an extremely short planning horizon or that they were speculating that this exemption would last longer than August 2021 or might even be permanent.[1]

[1] FI announced that the temporary exemption would last until 31 August 2021, with an option to extend if necessary. See, for example, https://www.fi.se/sv/publicerat/nyheter/2020/banker-har-nu-mojlighet-att-ge-undantag-fran-amortering/.

This FI analysis studies the temporary exemption from the amortisation requirements among new mortgage borrowers. The purpose is to analyse which groups of new mortgage borrowers used the exemption and how it affected their decisions on the price they paid for houses and the amount they borrowed.

As with FI's previous evaluations of amortisation requirements, we have used the difference-in-difference method to estimate how the exemption affected new mortgage borrowers. The exemption was introduced to mitigate the economic effects of the coronavirus pandemic, which might have affected households in different ways. This makes it more difficult to assess what was caused by the exemption and what was caused by the pandemic. There is therefore greater uncertainty in our estimates than would normally be the case. To reduce this uncertainty, we have used an extended difference-in-difference model (triple difference) in this FI analysis.

Exemption common among new mortgage borrowers with large loans

The exemption from amortisation payments was available both to households that already had a mortgage and those taking out a new mortgage. This differs from previous FI regulations, which only affected new mortgage borrowers. Almost 260,000 households decided to use this exemption, which is 12 per cent of all mortgage borrowers.[2] The exemption led to households amortising noticeably less. In total, households with new and existing mortgages amortised SEK 1,500 million less per quarter during the second and third quarters of 2020 than the first quarter of 2020. This represents approximately 10 per cent of total household amortisation. Per quarter, this is the equivalent of 0.3 per cent of household consumption or 3.5 per cent of the increase in bank deposits (bank savings) among households.

We have studied new mortgage borrowers using FI's Mortgage Survey (see Finansinspektionen, 2021). These surveys refer to new mortgages from the end of September/beginning of October and the end of October/beginning of November. [3] Households in the survey from 2020 were therefore able to use the exemption on their new mortgage for 10 or 11 months, as the temporary exemption ended on 31

[2] This data is for April 2021. Households that used the exemption may appear several times in the statistics.
[3] We have no detailed information on existing borrowers, so we are unable to analyse how the exemption affected households that already had a mortgage.

August 2021. However, these households may also have used the exemption for a previous mortgage, so could have used the exemption during the entire period.

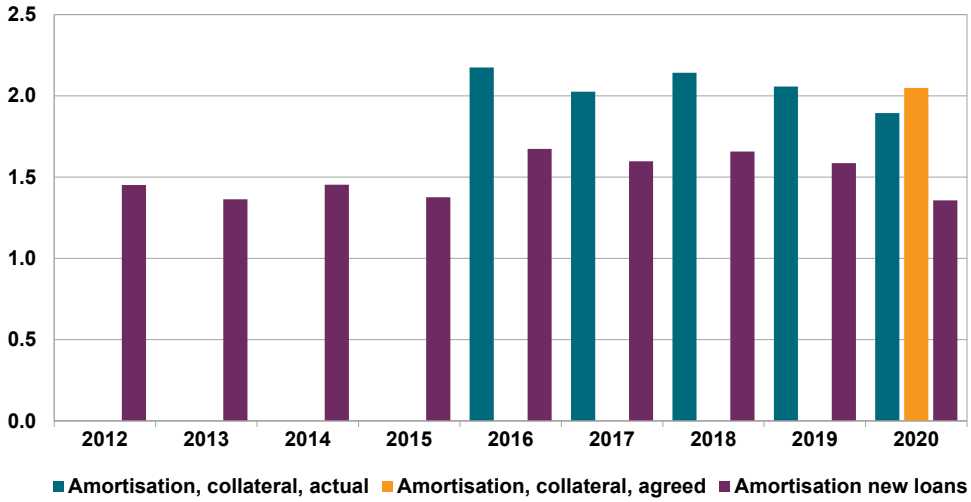
Approximately 60 per cent of new mortgage borrowers borrowed to buy a new house, while the rest took out a new loan on an existing house (home equity withdrawal).[4] The average new loan for home buyers was SEK 2 million, while the average home equity withdrawal was just over SEK 0.5 million. Both of these groups were able to take advantage of the temporary exemption. A new mortgage borrower who did not have to amortise in accordance with the amortisation requirements could decide (in consultation with their bank) not to amortise even without the temporary exemption. This means the option of using a temporary exemption was open to people who had to amortise in accordance with the amortisation requirements.[5]

The Mortgage Survey for 2020 includes 26,987 new mortgage borrowers. There were 19,485 borrowers who had to amortise in accordance with the amortisation requirements. Of these, 11 per cent reached an agreement with their lender not to amortise, either in whole or in part, until September 2021. Just over 80 per cent of them, in turn, received an exemption from the entire amortisation amount. This exemption resulted in the average annual amortisation rate for new mortgage borrowers falling to 1.9 per cent. This is the lowest amortisation rate since FI introduced its first amortisation requirement in 2016 (see Diagram 1).

[4] We have not included people who switched banks, but remained in the same house.
[5] Approximately 0.6 per cent (33 households) of those who did not have to amortise in accordance with the requirements registered that they had used the exemption in FI's Mortgage Survey for 2020.

Diagram 1. Annual amortisation as a proportion of loans

Per cent



Source: FI.

Note: The amortisation of collateral refers to the amortisation payments for new mortgage borrowers as a proportion of the total mortgage volume. *Actual* is the actual (observed) amortisation and *agreed* is the amortisation rate as set out in the agreement. In 2016–2019, the actual amortisation was the same as the agreed value. The difference between the agreed and actual amortisation in 2020 is due to the temporary exemption. *Amortisation new loans* is the amortisation of new mortgages as a proportion of the mortgage on the collateral in question. This has been included in the diagram to provide information about the trend before the first amortisation requirement was introduced.

The proportion with an exemption is distributed relatively evenly across different groups of new mortgage borrowers. However, there are some differences. It was primarily households that have to amortise in accordance with both requirements that used the temporary exemption (see Diagram 2). In addition, the figure for those who used the exemption was almost twice as high among those who were borrowing to buy a new house, 13 per cent, compared with those making home equity withdrawals, 7 per cent. One possible explanation for this is that home buyers take out larger loans and the exemption was more beneficial in monetary terms for those taking out large loans.

There were slightly more new mortgage borrowers under 50 years old who used the exemption, but the differences were only small when compared with those over 50. These differences were even smaller when broken down by household surplus using the KALP (discretionary income) calculation.[6] This indicates that the exemption was used by borrowers regardless of their financial situation. However, this does not exclude the possibility that the exemption was used for different purposes; households with small margins may have been more inclined to use the

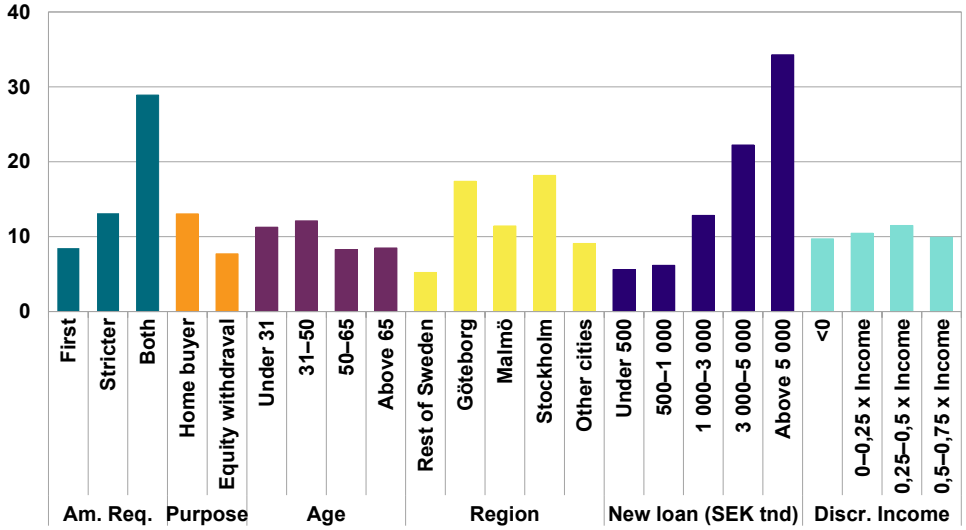
[6] This calculation shows how much money a household has left of their income after they have paid their interest payment, amortisation payment and essential living costs.

exemption for consumption purposes, while those with higher margins may have decided to use it for savings.

The proportion of those who used this exemption was higher in the three biggest cities in Sweden. This could be because they take out the largest loans. Breaking down the figures by the size of the new mortgage shows how important size is when explaining the proportion that used the exemption. One in three households with a new mortgage of more than SEK 5 million used the exemption. This can be compared with around one in 20 of those who borrowed less than SEK 1 million.

Diagram 2. New mortgage borrowers with an exemption; proportion of those who amortise in accordance with the amortisation requirements

Per cent



Source: FI.

Note: This diagram shows the proportion of those who used the temporary exemption in relation to those who amortise in accordance with the amortisation requirements, broken down by different household types. Households that amortise in accordance with the requirements refer to new mortgage borrowers with a loan-to-value ratio of more than 50 per cent and a lloan-to-income ratio of more than 450 per cent.

New mortgage borrowers with the exemption borrowed more

We have broken down households into those that have to amortise in accordance with the amortisation requirements and those that do not, as this enables us to compare new mortgage borrowers who could be granted an exemption with everyone else. According to the amortisation requirements, households with a loan-to-value ratio of more than 50 per cent or a loan-to-income ratio of more than

450 per cent have to amortise.[7] When taking out a mortgage, it is only households that have to amortise in accordance with the requirements that were also affected by the exemption. We have assumed that households that do not need to amortise in accordance with the requirements were already able to influence their amortisation rate before the exemption.

Between 2016 and 2019, the average new mortgage developed in roughly the same way both for those with a high loan-to-value ratio or loan-to-income ratio (i.e. those that have to comply with the amortisation requirements) and those that do not have to amortise in accordance with the requirements (see Diagram 3).[8] One difference between the groups is that mortgages and purchase prices slowed more in 2018 among households that had to comply with the amortisation requirements. This had been expected and was a result of FI introducing the stricter amortisation requirement in 2018, which affected households borrowing at high loan-to-income ratios (see Andersson and Aranki, 2019). In 2019, both of these groups saw a similar increase in mortgages and house prices once again.[9]

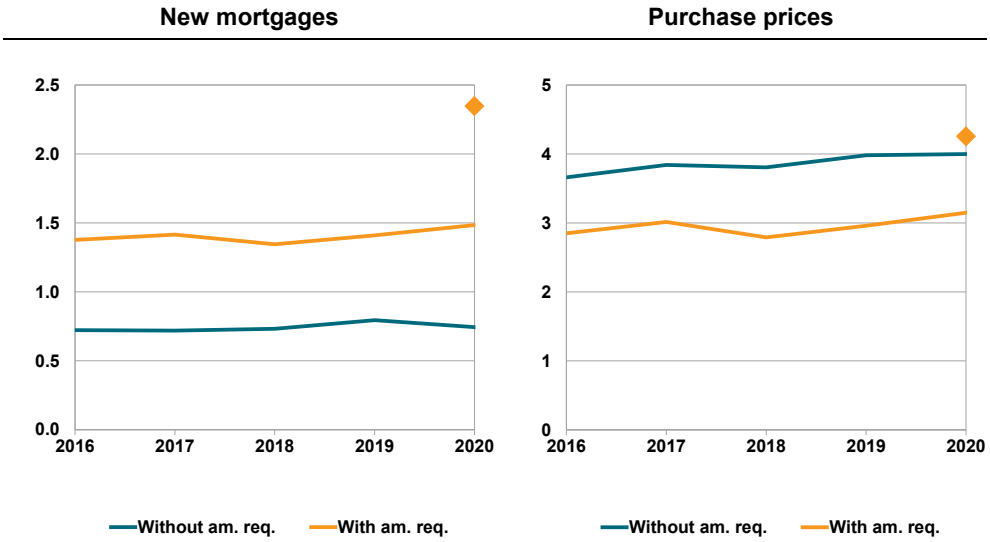
When FI allowed lenders to grant borrowers a temporary amortisation exemption in 2020, new mortgages slowed down (purchase prices remained the same) for households that did not have to comply with the amortisation requirements. This was not because of the exemption, but more likely due to deteriorating demand prospects and greater uncertainty about future economic developments. However, there was an increase in average new mortgages and purchase prices for households that have to amortise in accordance with the requirements and could therefore use this exemption. One explanation could be that households that were granted the exemption were those that on average borrow a lot and buy expensive houses, as this exemption offered a great deal of relief (in monetary terms) for these households. It could also be because this exemption resulted in households borrowing more and buying more expensive houses.

A break from amortisation payments resulted in lower loan payments, which might explain why households borrowed more and bought more expensive houses. The extent to which households can adapt to this kind of break depends on the length of the break. Households were able to use this exemption for up to 17 months, which is a relatively short period of time compared with the amount of time they live in their houses.[10] This would suggest that the exemption had a limited impact. However, there may be households that were affected more. Some households plan

[7] The loan-to-value ratio is calculated by dividing mortgages by the value of the house; while the loan-to-income ratio is calculated by dividing mortgages by income before tax.
[8] Before 2016, there were no statutory amortisation requirements.
[9] The development of loans and prices in Diagram 2 cannot be directly compared, as it is only home buyers who affect the purchase prices. Households that have made home equity withdrawals bought their house earlier on.
[10] The median value for the length of time that households live in single-family houses and tenant-owned apartments is 22 years and 7 years respectively.

to live in their new house for a short period of time. In addition, households that borrow just over 450 per cent of their income can avoid the stricter amortisation requirement in the future if their salary increases, even with the exemption. Furthermore, some households may have expected the amortisation exemption to last longer or even be permanent. There are also households that only take a short-term approach to their cash flow.

Diagram 3. Development of new mortgages and house prices, average
SEK million



Source: FI.
Note: 'Without amortisation requirements' refers to new mortgage borrowers who do not have to amortise in accordance with the requirements. 'With amortisation requirements' (solid yellow line) refers to all new mortgage borrowers with a loan-to-value ratio of more than 50 per cent or a loan-to-income ratio of more than 450 per cent. The rhomboid represents a subgroup of those that have to comply with the amortisation requirements who also used the exemption. Bank switchers and new mortgage borrowers who borrowed to buy a new build or an agricultural property have been excluded.

The exemption did not affect all new mortgage borrowers

Although the increase in new mortgages among households that need to comply with the amortisation requirements would indicate that the exemption affected these households, it may also be due to other factors. To assess the impact of the exemption, we need to compare what would have happened without the exemption. As this is not directly observable, this is something we have to estimate. We do this by creating two groups of new mortgage borrowers who are as equal as possible, apart from the fact that only one group was affected by the exemption.

As the exemption applied to households that had to amortise in accordance with the requirements, it is natural to create a group of households with a loan-to-value ratio of more than 50 per cent or a loan-to-income ratio of more than 450 per cent. We call this group T_1. Group T_1 therefore comprises not only new mortgage borrowers who used the exemption, but also everyone who had the option of using this exemption. We have placed households that did not need to amortise according to the amortisation requirements in a control group, which we call K_1. When creating these groups, we have not included bank switchers and those that bought a new build or agricultural property, as they were already exempt from amortisation in accordance with the regulations. This has resulted in approximately 78 per cent of households in 2020 being included in the group that have to comply with the amortisation requirements and could therefore use the exemption.

Using the groupings above, we can compare the development between new mortgage borrowers with and without amortisation requirements, and therefore with and without the option of using the exemption. The idea behind this is that the borrowing behaviour of the groups should have developed in the same way in 2020 without the exemption. If it turns out that borrowing behaviour developed in a similar way historically, it would support that this would have happened in 2020 without the exemption. We have used this to estimate how borrowing behaviour in the group affected by the exemption would have developed if FI had not introduced it.

The coronavirus pandemic affected new mortgage borrowers

It is not only the exemption that may have affected our groups of new mortgage borrowers. The coronavirus pandemic had a major impact on the global economy in 2020, lowering expectations about future economic developments. In Sweden, the economic situation changed rapidly from March. The stock market fell immediately by more than 30 per cent and house prices by almost 2 per cent. Unemployment rose by 1.8 percentage points up until October, which is the period covered by the Mortgage Survey. However, by October, the Stockholm Stock Exchange had fully recovered from the fall and house prices had actually increased by 7 per cent compared with March.

These economic developments may have affected new mortgage borrowers in different ways. Some mortgage borrowers may have been directly affected or reacted strongly to a deterioration in their future prospects. They wanted to buy cheaper houses and borrow less. However, other mortgage borrowers may have wanted to buy larger and more expensive houses, for example, because they were working from home more. All of this combined makes it more difficult to analyse the effects of the exemption. This is particularly true if our groups of mortgage borrowers are not comparable and if the pandemic impacted the groups differently.

The composition of new mortgage borrowers did not change between 2019 and 2020 (see Appendix A). Factors, such as income, age distribution, family composition and type of house were approximately the same. This indicates that the pandemic had a similar impact on both groups in many ways. However, households that had to amortise in accordance with the requirements differ from those that did not have to amortise. For example, households with a high loan-to-value ratio or loan-to-income ratio borrowed more and bought cheaper houses, compared with those that had small loans. This suggests that the groups may have reacted differently; that they had *heterogeneous responses* to the turbulent developments in 2020.

Heterogeneous responses to anything other than the exemption presents a challenge for this analysis. If they are responses to shocks that occur frequently, we can identify them in historical data. However, if they are responses to shocks that occur rarely, it is more difficult to assess whether they are heterogeneous. The coronavirus pandemic is an example of this kind of rare shock. It also had a major impact on the economy in many different ways.[11] As a result, it is probable that the uncertainty in our estimates of the impact of the exemption on new mortgage borrowers is greater than would have been the case in a more normal year. Depending on how the groups were affected, we may have both underestimated and overestimated the effect of this exemption.

Households that borrowed for a new build were not affected by the exemption

We need to identify additional households that are similar in other ways, but who were only affected by the exemption, so that we can separate any heterogeneous responses as far as possible from the impact of this one effect. FI's Mortgage Survey contains information about new mortgage borrowers who take out a loan to buy a new build. The regulations state that these households do not have to amortise for the first five years. It is also common for banks to provide interest-only loans (without amortisation) to people when they buy new builds. The proportion of interest-only loans to households with high loan-to-value ratios or loan-to-income ratios doubled between 2020 and 2019.[12] This suggests that lenders are more flexible when lending money for the purchase of new builds. However,

[11] As new mortgage borrowers that amortise in accordance with the requirements differ from those who do not need to amortise, these groups may react differently to shocks (see Kahn-Lang and Lang, 2020).
[12] This applies to households that did not request a temporary exemption in 2020.

there are also lenders that do not grant an exemption from the amortisation requirements for the purchase of a new build.[13]

Approximately half of those that have bought a new build amortise at least to the same level as set out in the requirements. We have disregarded these households and have created two additional groups.[14] These groups do not have to amortise in accordance with the requirements, irrespective of their loan-to-value ratio or loan-to-income ratio. The two groups of households that were not affected by the exemption are therefore:

- The control group (K_2) comprises new mortgage borrowers who bought a new build with a loan-to-value ratio of less than 50 per cent and a loan-to-income ratio of less than 450 per cent.
- The second group (T_2) comprises new mortgage borrowers who bought a new build, but with a loan-to-value ratio of more than 50 per cent or a loan-to-income ratio of more than 450 per cent.

These groupings enable us to calculate and estimate the effect of heterogeneous responses caused by the coronavirus pandemic. However, there is a risk that these groupings do not fully capture the heterogeneous responses. One of the reasons is because purchase contracts can be signed a long time before the moving-in date. It is more common with new builds for there to be a long period of time between signing the contract and moving in. If many mortgage borrowers (who bought new builds) signed contracts before the pandemic started, it would create uncertainty in our calculations and estimates of heterogeneous responses.[15] This is particularly the case for purchase prices. New mortgage borrowers can always adjust their loans right up until the moving-in date, provided that the loan-to-value ratio does not exceed 85 per cent. This means that there should be less uncertainty in our estimates of heterogeneous responses to new mortgages than on purchase prices.

Our groups therefore include one group that has to amortise in accordance with the requirements (T_1) and three groups that do not have to amortise in accordance with the requirements (K_1, T_2 and K_2). The trend in mortgages in these four groups reveal two observations that are important for the analysis. The first observation is that mortgages for all four groups developed in a similar way between 2016 and

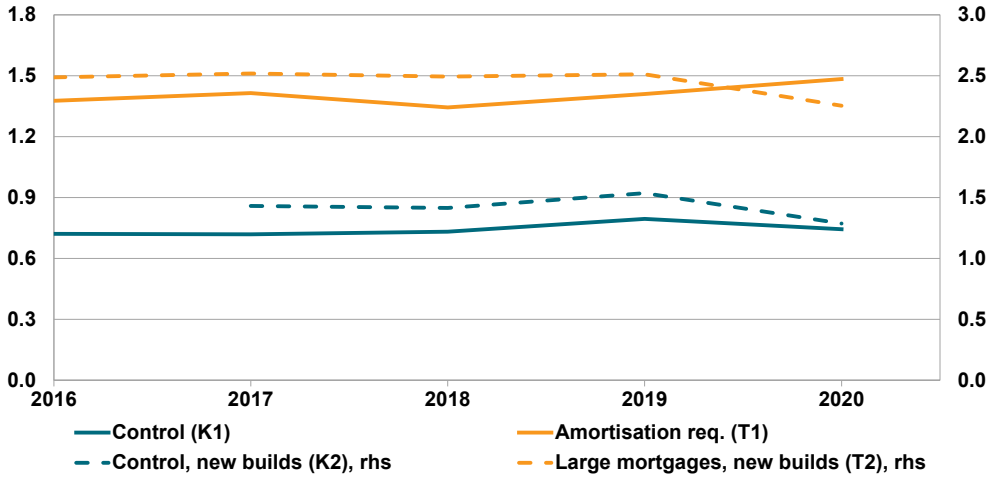
[13] Some lenders grant amortisation exemptions for loans for new builds, while other lenders grant an exemption following an assessment. There are also lenders that do not grant an exemption. We have assumed that borrowers choose their lenders when taking out their new loan. The amortisation requirement is therefore not binding, in theory, for households that take out a loan for a new build.
[14] Almost 5 per cent of households that bought new builds (21 households) amortised at least 1 percentage point more than is required in the amortisation requirement. We have included these households in the analysis, as it is likely that they themselves chose to amortise.
[15] The Mortgage Survey contains no information about when the purchase contracts were signed.

2019 (see Diagram 4).[16] One difference is that households that bought new builds did not borrow less in 2018, unlike those that had to comply with the amortisation requirements. This is because households that bought new builds were not affected in the same way by the stricter amortisation requirement. Another interesting observation is that only the group of households that have to amortise in accordance with the requirements borrowed more in 2020 than in 2019. This suggests that the temporary exemption resulted in these households borrowing more.

If we assume that group T_2 and K_2 would have developed in the same way if the coronavirus crisis had not happened and that the exemption did not affect these groups, the difference between these groups in 2020 gives us an estimate of heterogeneous responses. Similarly, we can interpret the difference between T_1 and K_1 as the impact of both heterogeneous responses *and* the exemption. We can therefore use these four groups together to identify the impact of the exemption. Appendix B summarises our groupings and how they identify the impact of the exemption.

Diagram 4. Similar development for new mortgage borrowers with large and small loans

SEK million



Source: FI.

Note: 'Control' refers to new mortgage borrowers with a loan-to-value ratio of less than 50 per cent and a loan-to-income ratio of less than 450 per cent. 'Amortisation requirements' and 'Large mortgages' refer to those with a loan-to-value ratio of more than 50 per cent or a loan-to-income ratio of more than 450 per cent. (K_1) and (T_1) do not include those who borrow to buy a new build. (K_2) and (T_2) are only households that borrow to buy a new build. Note that the regulations also exempt 'Large mortgages' from the amortisation requirements.

[16] In the Mortgage Survey for 2016, there were only a few observations reported of new mortgage borrowers buying a new build with low loan-to-value ratios and loan-to-income ratios. This is why no value is reported for this group in 2016 in Diagram 4.

A more direct way of calculating the impact of the exemption would be to use groups T_1 and T_2, as the composition of these groups are similar (see Appendix A). However, there are some differences. These differences include a higher proportion of apartments among those who buy new builds and that they are more expensive on average than existing properties.[17] This means that there may also be heterogeneous responses to the coronavirus crisis between these groups as well. At the same time, the recent sharp rise in prices probably led to households in group T_1 buying more expensive houses than households in group T_2. This is because mortgage borrowers who buy a new build are more likely to terminate their contracts earlier than those who buy an existing house. This kind of comparison will therefore overestimate the impact of the exemption.

Calculations indicate that households borrowed more than without the exemption

The historical relationship suggest that we can compare our different groups of new mortgage borrowers in order to calculate the impact of the exemption (see Diagram 4). Households that were able to use the exemption (i.e. those that need to comply with the amortisation requirements, T_1) borrowed 6.6 per cent more in 2020 than for the average loan in 2017–2019. At the same time, households in the control group (K_1) borrowed 0.5 per cent less. The difference in growth indicates that the exemption *and* heterogeneous responses resulted in households borrowing 7.1 per cent more (see Table 1).[18] The corresponding calculation for households with large mortgages that bought new builds (T_2) and comparable borrowers with small loans (K_2) shows an impact of 1.9 per cent from heterogeneous responses. If the first specification (T_1–K_1) calculates the effect of the exemption *and* heterogeneous responses, and the second specification (T_2–K_2) measures heterogeneous responses, the difference between these calculations means that households that could have had an exemption took out mortgages that were 5.2 per cent higher than they would have done without the exemption.[19]

[17] Households that buy new builds borrow more. However, the loan-to-value ratios are on average the same; 75 per cent for both groups T_1 and T_2.
[18] This calculation is based on the mortgages of both groups falling by 0.5 per cent if there had been no exemption and heterogeneous responses.
[19] When we compare new mortgage borrowers with high loan-to-value ratios and loan-to-income ratios (T_1–T_2), the calculations show an impact of 17.2 per cent. The calculated impact is mostly due to a sharp increase in prices recently, which primarily affected households in group T_1.

Tabell 1. Estimated effects

Per cent

Specification:	Impact	Identifies
T_1–K_1	7.1	Heterogeneous responses, exemption
T_2–K_2	1.9	Heterogeneous responses
(T_1–K_1)-(T_2–K_2)	5.2	Exemption

Source: FI.
Note: The table shows the calculated impact and what this identifies based on different specifications (models). T_1 and T_2 refer to households without, or only with, loans for new builds, with a loan-to-value ratio of more than 50 per cent or a loan-to-income ratio of more than 450 per cent. K_1 and K_2 refer to households without, or only with, loans for new builds, with a loan-to-value ratio of less than 50 per cent or a loan-to-income ratio of less than 450 per cent.

Model for estimating effects

The calculations above are relatively simple and intuitive. However, they do not take into consideration the many factors that can affect how much households decide to borrow. It is therefore likely that these calculations overestimate the effects. An econometric model can also take into consideration other characteristics, such as income, age, region of residence, family composition and type of house. It therefore offers greater certainty when estimating how the exemption impacted new mortgage borrowers. In addition, an econometric model provides some information about the uncertainty in the estimates. Our analysis is based on estimates that are statistically significant, i.e. where the effect is significantly different from zero. However, we will also comment on the size of point estimates that are not statistically significant.

We estimate different models, where each model has an equivalent in the simple calculations in the section above. As in previous FI evaluations, we have used the *difference-in-difference* model (DiD).[20] DiD models are often used to measure the causal effect of a reform.[21] Appendix C describes this model.

The best way of examining the effects of a reform would be to turn back the clock to see what would have happened without the reform; but this is, of course, impossible. An alternative approach is to use comparable individuals, where the only difference is that only some are affected by the reform. This is what the DiD method tries to achieve. This method is based on the randomness of an individual being affected by a reform or not, which is rarely the case in economic studies. It is

[20] See Finansinspektionen (2017), Andersson et al. (2018), Andersson and Aranki (2019), Aranki and Larsson (2019) and Andersson et al. (2020).
[21] See, for example, Card and Krueger (1994), which is one of the most well-known DiD studies, which analyses how an increase in the minimum wage affects employment.

the characteristics of the individuals that determine whether or not they are affected by the reform; i.e. the individuals are self-selected into a group of households that are affected by the reform or into a control group. However, self-selection should not depend on the reform.

In our scenario, there may be households who borrowed more because of the exemption and therefore chose to be in a different group. For example, households may have chosen larger loans that require amortisation payments. These households will then end up in the group that was affected rather than the control group. They were clearly affected by the exemption, so they must be included in the group that was affected. We have performed a number of sensitivity analyses for different assumptions of groupings by excluding individuals close to a threshold in the amortisation requirement. Our results remain after the sensitivity analyses.[22]

An extended model which accounts for heterogeneous responses

The typical characteristics of households taking out new mortgages did not change significantly in the Mortgage Survey for 2020; both the income distribution and age distribution were virtually the same as in previous years (see Appendix A). This indicates that the coronavirus pandemic did not affect which households took out mortgages; this is true for those that took out a loan for a new build or an existing house, and with or without amortisation requirements.

We use the four groups in the analysis to estimate the impact of the exemption when there are significant responses. These groups enable us to estimate several DiD models and one *difference-in-difference-in-difference* model (DDD).[23] The DDD estimate can be seen as the difference between two DiD estimates. Appendix C also describes the DDD method.

One important assumption for the DiD model is that new mortgages and house prices would have developed in a similar way for both groups if there had not been an amortisation exemption in 2020. For the DDD model, the relationship between the groups in the different categories of households (T_1/ K_1 and T_2/ K_2) would have developed in a similar way. This model therefore assumes that the heterogeneous responses are the same among households that buy new builds as those that buy

[22] We find that the results of this analysis are the same, even when we disregard the households that are just above the thresholds for the amortisation requirements (loan-to-value ratio of 50–55 per cent or a loan-to-income ratio of 450–460 per cent). These are mostly likely the households that may choose to end up in different groups, with or without the exemption.
[23] The triple difference or DDD is an extension of the DiD method that was first introduced by Gruber (1994).

existing houses. We have tested this assumption using developments up to and including 2019.[24]

Another assumption is that the other changes, around the time of the exemption, affected the groups in the same way, which would mean that there were no other heterogeneous responses. This assumption cannot be tested.

Test for common developments

Diagram 4 above shows that the trends before 2020 are similar for all groups.[25] This strengthens the assumption that they would have developed in a similar way in 2020 if the exemption had not been introduced. We have supplemented this visual inspection with statistical tests. These tests examine the hypothesis that the average development of new mortgages and purchase prices were the same in these groups (parallel trends) using data from the period 2016–2019. These results show that we cannot reject this hypothesis for any of our models (see Table C1 in Appendix C). It means that we cannot find any support to suggest that the assumption of groups developing in a common way in 2020 is incorrect. We have therefore estimated models to calculate the impact of the exemption.

New mortgage borrowers borrowed more during the exemption

By estimating models, we can differentiate the impact of the exemption from other factors that could have affected the size of new mortgages and purchase prices for houses as well. We can also study whether there are any differences in how the exemption affected different households. The model results show that the exemption affected the size of new mortgages that households took out, as well as the prices that new mortgage borrowers paid for their houses (see Table 2).[26]

We start with the model that compares new mortgage borrowers who are affected by the amortisation requirements with those who are not affected (T_1 with K_1). The models, both for new mortgages and purchase prices, show that the exemption and heterogeneous responses resulted in new mortgage borrowers, who have to

[24] In fact, we have tested the hypothesis that groups of borrowers develop in the same way. We can only do this with historical data.
[25] The relationship between the groups (T_1/ K_1 and T_2/ K_2) has also had a similar development historically.
[26] It has only been since 2018 that both amortisation requirements have been in place and that our groups have been fully comparable over time. In this model, we have therefore only used data for the period 2018–2020, even though this limits the sample for the analysis.

amortise according to the requirements, borrowing 5.4 per cent more and buying houses that were 2.7 per cent more expensive (see DiD1 in Table 2). Both of these estimates are statistically significant.[27]

The estimated effects on new mortgages and prices for households that bought a new build (the DiD2 models) are small and not statistically significant. This means that we have not been able to find anything to show that among the households that bought new builds, those who took out mortgages with a high loan-to-value ratio or loan-to-income ratio reacted differently to the coronavirus pandemic than those who took out mortgages with low ratios. Therefore, we cannot find any statistical support for heterogeneous responses.[28] This indicates that the impact from DiD1 above is from the exemption. This is also supported by DDD, which estimates the effect of the exemption directly (see Equation C.4 in Appendix C for estimating the DDD model). These estimates are statistically significant and close to the ones from DiD1. The results from the DDD models show that the exemption resulted in households that have to amortise in accordance with the requirements (and have therefore been able to use the exemption) borrowing 4.5 per cent more and buying houses that were 2.8 per cent more expensive.

Compared with the simple calculations above, the estimates show a smaller impact from the exemption and heterogeneous responses. This is because in these models we have taken into account other observable characteristics, such as interest, income, age, family composition, region of residence, type of house and size of house; these are factors that also affect how much households borrow and how much they spend on a house. Even after checking these characteristics, the fact remains that the exemption resulted in households borrowing more and buying houses that were slightly more expensive.

[27] We have redone the calculations, disregarding the highest 5 per cent of new mortgages and purchase prices respectively. The estimates are similar after removing the extreme values. This indicates that it is not large mortgages or purchase prices that drive our results.
[28] There were 21 new mortgage borrowers who bought a new build and chose to use the temporary exemption. The results remain the same when we disregard them.

Tabell 2. Model estimate for the impact of the exemption on new mortgages and purchase prices

Per cent and number

	New mortgages			Purchase prices		
	DiD1	**DiD2**	**DDD**	**DiD1**	**DiD2**	**DDD**
	T_1-K_1	T_2-K_2	(T_1-K_1)-(T_2-K_2)	T_1-K_1	T_2-K_2	(T_1-K_1) - (T_2-K_2)
Impact	5.4*** (3.3)	-1.1 (-0.1)	4.5*** (3.2)	2.7* (1.9)	1.3 (0.3)	2.8+ (2.6)
This model identifies	*HR & Ex*	*HR*	*Ex*	*HR & Ex*	*HR*	*Ex*
Coefficient of determination	71.0	69.1	71.0	80.5	79.4	80.4
Observations	66,848	657	67,505///	40,098	576	40,674

Source: FI

Note: *, **, *** indicates that the estimate is statistically different from zero at the 10, 5 and 1 per cent levels ('t' value in brackets). The table only shows the DiD and DDD estimates, which give the impact of the exemption. The dependent variables are logarithms for new loans and purchase prices. The models for purchase prices are only estimated for the households that bought a house. We also check for other variables that could explain the size of the loans and house prices (such as interest, income, age, family composition, region of residence, type of home and size of home). *HR* stands for heterogeneous responses and *Ex*. stands for exemption.

High-income earners tended to borrow more

We estimate the impact of the temporary exemption on different household types using the DiD1 model.[29] The analysis for different household types is more uncertain than the estimates for all new mortgage borrowers. This is because the smaller the groups we study, the fewer observations we can make.

The exemption did not affect the size of new home equity withdrawals among households (see Diagram 5). However, households that bought a house during the analysis period borrowed almost 9 per cent more. Households that made home equity withdrawals could use the exemption to save or consume, while homebuyers could also use the exemption to buy more expensive houses.

The stricter amortisation requirement has not affected those who made home equity withdrawals either (see Aranki and Larsson, 2019). However, the first amortisation requirement had a greater impact on households with home equity withdrawals than those who borrowed money to buy a house. Households that used the exemption included a higher proportion of those who amortise in accordance with the stricter requirement. Another possible reason why the exemption did not impact

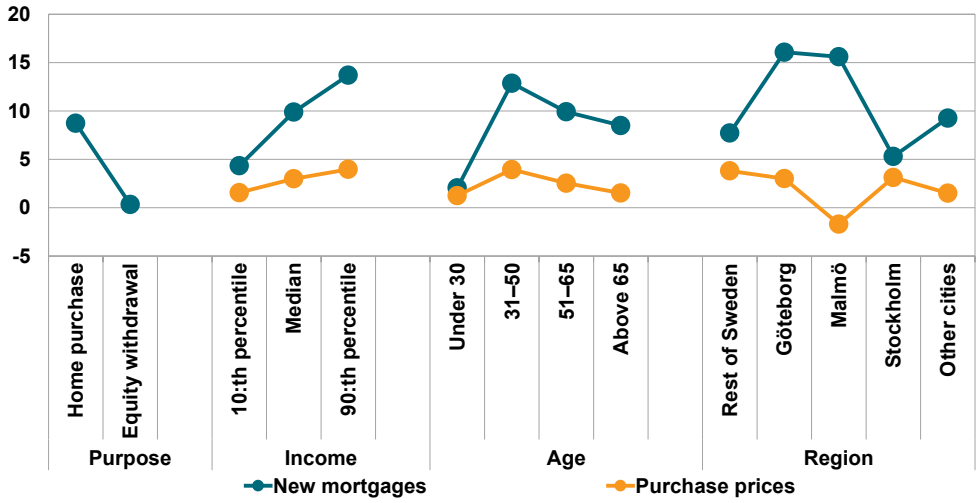
[29] The DDD estimate is equal to the DiD1 estimate in the absence of any heterogeneous responses, as the impact from DiD2 is equal to zero.

households that made home equity withdrawals is that the exemption only provided a small amount of relief in monetary terms for these households, as they had taken out much smaller loans.

As people who made home equity withdrawals did not change their behaviour as a result of the exemption, we have only estimated the impact on different household types among those who took out a loan to buy a house. It is primarily households with good incomes that borrowed more and bought more expensive houses. Young people (under the age of 30) did not change their behaviour as a result of the exemption. However, the older age groups borrowed more. People between the ages of 30 and 65 also bought houses that were more expensive than they would have bought without the exemption. This is probably due to the fact that households in this age group often want larger and more expensive houses, so this exemption proved more beneficial to them. The oldest group borrowed more, but did not buy more expensive houses. This indicates that they used this exemption either for savings or consumption. It was mostly new mortgage borrowers in Gothenburg and Malmö who borrowed more as a result of the exemption.

Diagram 5. Effects of the exemption on new mortgages and purchase prices for different household types

Per cent



Source: FI.

Note: The diagram shows the estimated effects of the exemption on different household types that were affected. These effects only refer to new mortgage borrowers who took out loans to buy a house.

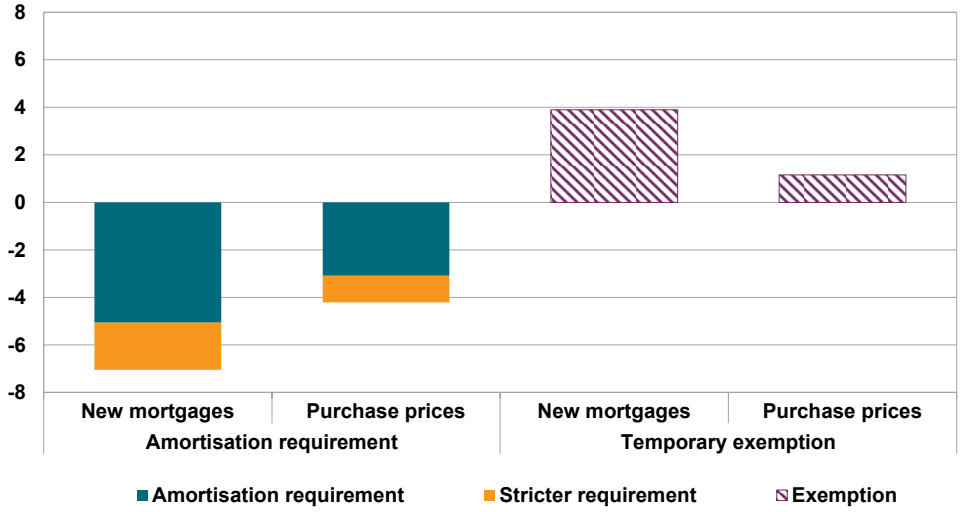
The exemption resulted in larger loans to buy houses

New mortgage borrowers, who have to amortise in accordance with the requirements, borrowed an average of approximately 4.5 per cent more than they would have done without the exemption. They also bought houses that were 2.8 per cent more expensive. The total impact of the exemption depends both on how many were affected and by how much. A weighting of our estimated effects with new mortgage borrowers who do not have to amortise in accordance with the requirements (and were therefore not affected by the exemption) shows that the amortisation exemption increased the average new mortgage by 3.9 per cent and that new mortgage borrowers bought houses that were on average 1.2 per cent more expensive (see Diagram 6). The exemption increased new mortgages by approximately half as much as the introduction of the two amortisation requirements together slowed down mortgages. The equivalent impact on purchase prices was about a quarter. These are relatively large effects, bearing in mind that the exemption was temporary and that a small proportion of new mortgage borrowers used it. This significant impact indicates that those who chose to take advantage of the exemption thought it was extremely worthwhile to have lower amortisation payments in the short term.

The fact that new mortgage borrowers borrowed more and bought houses that were more expensive as a result of the temporary exemption could be because they had expected this exemption to be extended after August 2021, or may even have thought that the amortisation requirements would never be reintroduced. It could also be because some borrowers have a short planning horizon and only look at their current loan payments when buying a house and taking out a loan. Another reason is that some mortgage borrowers might expect a large increase in income in the future, so took advantage of the exemption to buy more expensive houses now, without reducing any other consumption.

Diagram 6. Impact of borrower-based measures on new mortgages and purchase prices

Per cent



Source: FI

Note: The diagram shows the percentage change in new mortgages and purchase prices for houses as a result of the FI's borrower-based policy measures. The weighting of the effects of the exemption is calculated based on the estimated effects in Table 2 (the DDD estimate). The effects of the amortisation requirements have been taken from Andersson and Aranki (2019) and Aranki and Larsson (2019).

Although borrower-based measures affect both the size of mortgages and the purchase prices, they are affected to varying degrees. The introduction of the amortisation requirements slowed down mortgages more than purchase prices. This could be because the requirements resulted in new mortgage borrowers using more of their own savings for a downpayment. The fact that the temporary exemption increased mortgages more than prices would indicate the opposite; new mortgage borrowers used less of their savings for the downpayment and therefore borrowed more. The temporary exemption reversed the slowdown caused by the amortisation requirements and the impact was greater on mortgages than on purchase prices.[30] All in all, this indicates that home buyers also used the exemption for something different than buying a more expensive house.

One reason why some households used the exemption for something different than buying more expensive houses could be that new mortgage borrowers saw an opportunity to borrow more at a relatively low cost. These households could then choose to keep a larger buffer, in more or less risky assets, or use it for amortisation payments when the exemption came to an end. This effect could also have been caused by some new mortgage borrowers looking at their total

[30] The introduction of the amortisation requirements slowed down the purchase prices by approximately 60 per cent of the slowdown in new mortgages. The corresponding figure for the exemption is approximately 30 per cent.

amortisation during the whole period of time that they were planning to live in the house. For example, the total amortisation will be approximately the same for a household that borrows SEK 1.9 million and amortises for five years as a household that borrows SEK 2.4 million and amortises for four years.[31] They may also have chosen to spend more money on renovations when buying a house.

The amortisation exemption also resulted in some households reducing their amortisation by a large amount. The average annual amortisation rate fell by 0.2 percentage points in 2020 as a result of the exemption. This corresponds to approximately half of the increase in amortisation payments following the amortisation requirements. The amortisation rate during the period of the exemption was the lowest it had been since 2016, when FI introduced its first amortisation requirement. When the first amortisation requirement was introduced, there were many households that were already amortising in line with the requirement. The stricter amortisation requirement only affected a few households. The purpose of the temporary exemption was to improve mortgage borrowers' liquidity in a situation where there was a great deal of uncertainty about future economic developments. We are not able to observe how households used this money, so cannot say to what extent they saved, consumed or invested in their house.

In this FI analysis, we have shown that new mortgage borrowers who borrowed for home purchases borrowed more and bought slightly more expensive houses than they would have done if FI had not introduced the temporary exemption. At the same time, the turbulent economic situation during the coronavirus pandemic affected households in many different ways. As a result there is a greater amount of uncertainty in our estimates than would normally be the case.

[31] This applies at the same amortisation rate. Households that need to amortise in accordance with the requirements and used this exemption borrowed an average of SEK 2.4 million in 2020 (see Diagram 3).

References

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

Andersson, M.K. and T. Aranki (2019). Fewer Vulnerable Households after Stricter Amortisation Requirement, *FI Analysis 17*, Finansinspektionen.

Andersson, M.K., T. Aranki and A. Hult (2020). Fewer high-cost short-term credits after new rules, *FI Analysis 22*, Finansinspektionen.

Aranki T. and H. Larsson (2019). Fewer home equity withdrawals after amortisation requirements, *FI Analysis 20*, Finansinspektionen.

Card, D. and A.B. Krueger (1994). Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania, *American Economic Review*, 84 (4): 772–793.

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

Finansinspektionen (2020). Allmänna råd om undantag från amorteringskrav på grund av särskilda skäl, *FFFS 2020:3*, Finansinspektionen.

Finansinspektionen (2021). The Swedish Mortgage Market, dnr 21-4799, Finansinspektionen.

Gruber, J. (1994). The incidence of mandated maternity benefits, *American Economic Review*, 84 (3):622–641.

Kahn-Lang, A. and K. Lang (2020). The promise and pitfalls of Differences-in-Differences: Reflections on 16 and pregnant and other applications. *Journal of Business Economics and Statistics*, 38 (3):613–620.

Appendix A. Samples

Table A1. Summary statistics for our groups for 2019 and 2020

	2019			2020		
	Mean	**Median**	**90th percent**	**Mean**	**Median**	**90th percent**
Control group						
New loans (SEK)	794,720	400,000	1,950,000	743,953	400,000	1,750,000
Prices (SEK)	3,981,070	3,100,000	7,500,000	3,998,013	3,195,000	7,530,000
Income (SEK/month)	46,540	42,056	75,121	47,675	42,967	76,505
Amortisation payments (SEK/month)	1,475	500	4,329	1,469	500	4,207
Amortisation rate (%)	2.1	0.6	6.0	2.1	0.6	5.8
Living space, tenant-owned apartment (m^2)	84	77	118	78	76	115
Living space, single-family house (m^2)	134	127	190	131	126	188
Amortisation requirements						
New loans (SEK)	1,409,910	1,062,500	3,120,000	1,483,770	1,110,000	3,310,750
Prices (SEK)	2,958,678	2,450,000	5,500,000	3,148,519	2,600,000	5,800,000
Income (SEK/month)	47,696	46,732	71,536	49,085	47,602	73,719
Amortisation payments (SEK/month)	3,423	2,834	6,269	3,644	3,000	6,718
Amortisation rate (%)	2.1	2.0	3.0	2.1	2.0	3.0
Living space, tenant-owned apartment (m^2)	70	66	104	70	67	105
Living space, single-family house (m^2)	126	122	176	126	122	179
Large loans, new builds						
New loans (SEK)	2,512,123	2,200,000	4,634,700	2,254,262	1,910,000	4,300,000
Prices (SEK)	4,277,603	3,800,000	7,284,678	4,106,338	3,500,000	6,800,000
Income (SEK/month)	52,116	52,245	78,932	52,495	52,300	75,744
Amortisation payments (SEK/month)	3,272	3,046	6,917	3,074	2,897	7,101
Amortisation rate (%)	1.4	1.3	2.1	1.4	1.6	2.4
Living space, tenant-owned apartment (m^2)	70	65	112	78	76	117
Living space, single-family house (m^2)	155	154	245	155	152	240

Source: FI.
Note: Income is income before tax per month. The control group has a loan-to-value ratio of less than 50 per cent and a loan-to-income ratio of less than 450 per cent and did not buy a new build (group K_1 in the analysis). The 'amortisation requirements' group (T_1 in the analysis) has a loan-to-value ratio of more than 50 per cent or a loan-to-income ratio of more than 450 per cent, and did not buy a new build. The 'large loans, new builds' group (T_2 in the analysis) also has a loan-to-value ratio of more than 50 per cent or a loan-to-income ratio of more than 450 per cent, but bought a new build.

Table A2. Borrowers broken down into our groups for 2019 and 2020

		Control group		Amortisation requirements		Large loans, new builds	
		2019	**2020**	**2019**	**2020**	**2019**	**2020**
Households	*(Number)*	5,258	5,341	17,808	19,485	143	161
Age	*Under 30*	5.1	5.1	25.2	25.2	28.0	23.0
(distrib.)	30–50	30.6	28.4	51.2	51.2	49.7	50.3
	51–65	39.4	41.7	19.6	19.7	18.2	22.4
	65+	25.0	24.8	4.0	4.0	4.2	4.4
Region	Rest of Sweden	34.4	34.4	37.9	37.0	21.7	24.8
(distrib.)	Göteborg	13.0	11.5	10.2	9.7	16.8	9.9
	Malmö	6.4	7.0	6.3	6.8	10.5	6.8
	Stockholm	28.0	26.3	25.2	26.2	30.1	29.8
	Other cities	18.3	20.9	20.5	20.4	21.0	28.6
Family	1 adult no children	31.5	30.6	26.7	25.6	21.7	23.6
(distrib.)	1 adult with children	7.9	8.1	7.6	9.1	4.9	10.6
	2 adults no children	39.1	41.0	29.0	29.3	40.6	32.3
	2 adults with children	21.5	20.3	36.6	36.0	32.9	33.5
Margin	Negative	1.7	1.3	0.7	0.7	0.0	0.6
(distrib.)	0 = 25xInc.	14.7	13.7	17.9	18.0	13.3	9.9
	0.25 = 5xInc.	48.6	47.4	63.6	62.5	60.1	60.9
	0 = 5xInc.	35.1	37.6	17.8	18.9	26.6	28.6
Home	Tenant-owned apartment	33.4	31.9	42.5	43.9	57.3	62.7
(distrib.)	Single-family house	66.6	68.1	57.5	56.1	42.7	37.3
Purpose	House purchase	48.0	43.4	64.1	61.6	83.2	77.6
(distrib.)	Equity withdrawal	52.0	56.6	35.9	38.4	16.8	22.4
New loan	<0.5	58.0	58.7	31.7	31.1	11.9	16.2
(SEK million)	0.5–1	19.2	18.8	16.7	15.9	3.5	5.6
(distrib.)	1–3	19.3	20.0	40.8	40.5	55.2	51.6
	3–5	2.9	2.0	8.7	10.0	23.1	21.1
	>5	0.7	0.6	2.1	2.5	6.3	5.6

Source: FI

Note: The distributions (*distributed*) are expressed as a percentage and add up to 100 in each category. The control group has a loan-to-value ratio of less than 50 per cent and a loan-to-income ratio of less than 450 per cent and did not buy a new build (group K_1 in the analysis). The 'amortisation requirements' group (T_1 in the analysis) has a loan-to-value ratio of more than 50 per cent or a loan-to-income ratio of more than 450 per cent, and did not buy a new build. The 'large loans, new builds' group (T_2 in the analysis) also has a loan-to-value ratio or a loan-to-income ratio of more than 450 per cent, but bought a new build.

Appendix B. Groups and models

We have created our analysis groups using two classifications. The first cut-off is new mortgage borrowers with a loan-to-value ratio of more than 50 per cent or a loan-to-income ratio of more than 450 per cent. The second cut-off is when borrowers bought a new build or an existing house. That gives us four groups.

One group comprises households that have at least a high ratio (loan-to-value ratio or loan-to-income ratio) and bought an existing house. They have to amortise in accordance with the requirements (see Table B1). We call this group T_1. People who buy an existing house and have low ratios are the control group for T_1. We call this control group K_1.

We then make a corresponding categorisation of households that bought a new build. We place those with large loans (a high loan-to-value ratio or loan-to-income ratio) into group T_2. We place those with low ratios into group K_2. Neither T_2 nor K_2 have to amortise in accordance with the requirements.

If we use all four groups, it gives us an estimate of the impact the exemption had on new mortgage borrowers.

Table B1. Groupings and identified effects

				Affected by	
Group	**High ratio**	**New builds**	**Amort. req.**	**Heterogeneity**	**Exemption**
K_1					
T_1	✓		✓	✓	✓
K_2		✓			
T_2	✓	✓		✓	

Specification:	**Identifies**
T_1–K_1	Heterogeneous responses, exemption
T_2–K_2	Heterogeneous responses
(T_1–K_1)-(T_2–K_2)	Exemption

Source: FI

Note: A high ratio means that the borrower has a loan-to-value ratio of more than 50 per cent or a loan-to-income ratio of more than 450 per cent.

Appendix C. Estimation method

We use the same type of difference-in-difference model (DiD) as in FI's evaluations of amortisation requirements (see the Appendix in Finansinspektionen, 2017). In addition to this model, we have used a *triple difference* model (DDD) in this FI analysis. The DDD model combines the information from two DiD models. Assume that DiD 1 is the first model, and can be written as

(C.1) $$d_1 = \left(\bar{y}_{T_{1,\text{after}}} - \bar{y}_{T_{1,\text{before}}}\right) - \left(\bar{y}_{K_{1,after}} - \bar{y}_{K_{1,\text{before}}}\right),$$

where $\bar{y}$ is the average of the variable we are analysing (new mortgages or purchase prices of houses). T denotes the group affected by a reform and K is a control group (that is not affected). $after$ and $before$ denotes after and before the reform. Similarly, we can write the second model, DiD 2

(C.2) $$d_2 = \left(\bar{y}_{T_{2,after}} - \bar{y}_{T_{2,before}}\right) - \left(\bar{y}_{K_{2,after}} - \bar{y}_{K_{2,before}}\right).$$

In our case, d_1 identifies the impact of the amortisation exemption and heterogeneous responses between groups T_I and K_I. The coefficient d_2 identifies only the impact of heterogeneous responses. This means that

(C.3) $$\begin{aligned} d_1 - d_2 = &\left(\bar{y}_{T_{1,after}} - \bar{y}_{T_{1,before}}\right) - \left(\bar{y}_{K_{1,after}} - \bar{y}_{K_{1,before}}\right) \\ &- \left(\bar{y}_{T_{2,after}} - \bar{y}_{T_{2,before}}\right) + \left(\bar{y}_{K_{2,after}} - \bar{y}_{K_{2,before}}\right), \end{aligned}$$

gives an estimate of how the exemption affected new mortgages or purchase prices.

To take into account the effects of other variables (other than new mortgages and prices respectively), we formulate model (C.3) as

(C.4)) $$\begin{aligned} y_{j,treat,post} = &\beta_0 + \beta_1 j + \beta_2 treat + \beta_3 post + \beta_4 j \times treat \\ &+ \beta_5 j \times post + \beta_6 treat \times post + \beta_7 j \times treat \times post \\ &+ \textstyle\sum_i \gamma_i \times z_i + \varepsilon_{j,treat,post} \end{aligned}$$

where $j = 0$ if the borrower has bought a new build, otherwise 1. If the borrower has a loan-to-value ratio of more than 50 per cent or a loan-to-income ratio of more than 450 per cent, the variable $treat$ is given the value 1, and otherwise 0. The variable $post = 1$ after the reform and 0 before. z_i are variables that affect y. These variables can be continuous (such as income and market value) or category variables (such as region of residence, age group or family composition). The estimate of β_7 gives an estimate of the impact of the exemption.

Test for common trends

Table C1. Testing parallel trends between groups

t values

	Without new builds		**Only new builds**		**Only large loans**		**Without and only with new builds**	
	(T1–K1)		(T2–K2)		(T1–T2)		(T1/K1)–(T2/K2)	
	New loans	Purchase prices	New loans	Purchase prices	New loans	Purchase prices	New loans	Purchase prices
2016	-0.56	-1.25	0.07	-1.34	-0.86	0.95	-0.02	1.11
2017	1.77	-0.17	0.87	0.32	-1.57	1.13	-0.51	-0.31
2018	0.61	0.52	0.54	0.94	-1.09	-0.01	-0.38	-0.91
2019	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*	*Ref*
Observations	121,049	75,051	1,153	1,027	93,569	61,385	122,202	76,078

Source: FI.

Note: The table shows significance tests (*t* values), where the average development in loan size and purchase prices were the same (parallel trends) in the groups before the exemption in 2020. The figures are compared with the reference year, 2019 (the year before the exemption). If the *t* value is higher than 1.96 or lower than -1.96, the coefficient is significant at the 5 per cent level. If the coefficient is not significant, it indicates that the development was the same between the groups as in 2019 (the year before the exemption).