

# FI Analysis

## Interest deduction and household loans

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### Summary

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The tax reduction for interest expenses, or '*interest deduction*', enables households to borrow more, and makes them able and willing to pay more for houses. This increases both the liabilities and assets of households, which can in turn have an impact on the stability of the financial system. We have analysed the effects of changing the interest deduction because of this direct link to household loans.

The interest deduction should be viewed in context; as part of a capital taxation system. The special rules for the taxation of capital income mean that the deduction is higher in practice than the tax on many forms of capital income. This deviates from the 'neutrality principle'. We have calculated a hypothetical reform that lowers the interest deduction from its current rate of 30 per cent to 20 per cent, which is more in line with the principle of tax neutrality.

In these calculations, we have used data from FI's borrower surveys, which includes information about interest rates, the size of the loan and the purchase price. This information is not included in Statistic Sweden's microsimulation model FASIT. Our calculations therefore help to analyse the effects of a change to the interest deduction.

They show that lowering the interest deduction presents a trade-off between the short-term and long-term effects. Unlike other measures used to halt increases in household borrowing, such as mortgage caps and amortisation requirements, every household that has a loan would be affected by the reform; not just those that take out a loan after the reform has been implemented. *In the short term*, those who already have a loan will be negatively impacted. Their interest expenses will increase, which will reduce their cash flow, while the value of their houses will fall slightly. However, the current low interest rates mean that the effect on cash flows and house prices will be relatively small. The effects will increase if interest rates increase.

The borrowing cost for all borrowers will be higher if the interest deduction is lowered. For new borrowers, i.e. those who take out a loan after the interest deduction is lowered, it will be cheaper to buy a house. They are therefore expected to borrow less, so will not be affected to the same extent as existing borrowers. *In the long term*, loans taken out after the rule change will account for an increasing proportion of the loan stock, and the consequences for financial stability are expected to be generally positive.

Any negative effects in the short term could be mitigated in several ways. A lower interest deduction will increase the tax revenue of the state. This money can be returned to households in a way that reduces the impact on their cash flows. Limiting the interest deduction could also be rolled out gradually, which is an approach that has been taken in other countries.



## Interest deduction and financial stability

In the 2000s, house prices and lending to households rose sharply. In 2019 household loans amounted to SEK 4,200 billion. This represents approximately 185 per cent of the households' disposable income. Large loans make households vulnerable to rising interest costs and falling house prices.

Finansinspektionen (FI) has taken several measures to limit the build-up of vulnerabilities for financial stability linked to household mortgages. This includes tightening the capital requirements for banks as well as introducing a mortgage cap and amortisation requirements. These measures have slowed down lending and broken the trend of a rise in the proportion of highly leveraged households.

Tax rules play a role in how much households borrow. This is particularly true for the *interest deduction*, which is basically a tax deduction for interest expenses. The interest deduction reduces borrowing costs for borrowers. Monthly payments for a loan amount become smaller; or conversely households can borrow more for the same monthly payment.

Several international organisations have recommended that Sweden lower its interest deduction.<sup>1</sup> Ireland, Finland and the Netherlands are examples of countries that have recently limited interest deductions for households. Some countries have also decided not to give the deduction for interest on consumer credit, and only to use it for mortgages.

It is not part of FI's remit to determine how the tax system is designed; this is the job of the Swedish Government and the Swedish Parliament. However, one of the key roles of FI is to help ensure a stable financial system and to prevent any financial imbalances from building up (Finansinspektionen, 2019c). The close link between the interest deduction and household loans is the reason why FI has analysed how a change to the interest deduction could impact borrowers and financial stability.

### Fact Box 1. FI's borrower surveys

Since 2011, FI has been collecting detailed data about households that have taken out a new mortgage in its Mortgage Survey (*Bolåneundersökningen*). This data includes household income, house values, the size of new and existing loans, and their composition. See Finansinspektionen (2020a) for more information. Since 2017 FI has been collecting the equivalent data about people who have taken out new consumer credit. Finansinspektionen (2020b) provides more information about its consumer credit survey.

### FI HAS UNIQUE DATA ON NEW BORROWERS

We start our analysis by explaining what the interest deduction is. We then show the calculations we have made using FI's data on new borrowers (see Fact Box 1). After that, we show how lowering the interest deduction will impact the households that already have mortgages or consumer credits. We have studied both how their costs will increase and what proportion of households will see a deficit in their monthly budgets. Both calculations have an impact on household resilience to economic disruptions.

We report the results for different household types. This shows which households are impacted the most by the interest deduction. We then describe how new mortgage borrowers may be expected to change their behaviour if the interest deduction is lowered. We estimate both how much less they will pay for a new house and how much less they will borrow to finance their purchase. In the final section, we discuss links between a change to the interest deduction on the one hand, and

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<sup>1</sup> See, for example, IMF (2019) and European Commission (2019).

the macro economy, vulnerabilities and FI's borrower regulations on the other.

Many of our calculations are similar to the ones in Englund (2016), which are based on control data of the capital income and capital expenses of Swedish borrowers.<sup>2</sup> Although this material covers all Swedish households, it has limited information about loans and house values. One advantage of FI's data is that it allows us to conduct experiments where house prices or interest rates change, as we are looking at both prices and interest rates.<sup>3</sup> In these experiments, we can work out how borrowers will react. This is partly dependent on the impact that a change in the regulations will have on prices. The more prices go down, the smaller the effect it has on the monthly payments of new home buyers. If the interest rate or interest deduction changes, we can estimate how household demand for houses would change, i.e. how much cheaper the houses would be that households buy and how much less households would borrow.

### A LACK OF NEUTRALITY MAY IMPACT FINANCIAL STABILITY

To simplify this, we can say that the interest deduction is currently 30 per cent of an individual's interest payments. If someone pays SEK 100 in interest, their tax will be reduced by SEK 30. This applies to interest expenses up to SEK 100,000 per year. The deduction is 21 per cent for any amounts above this figure. Also see Fact Box 2.

Interest expenses are included in the tax return under 'capital income' with a minus symbol. The reason why the deduction is 30 per cent is because of the formal (also called the 'nominal') tax rate on capital income. This is to reflect 'neutrality', which was an important guideline in the Great Tax Reform in the early 1990s (see Agell, et al., 1995). In terms of home buying, neutrality means that the tax rules cannot influence the choice between buying a house with borrowed money or own savings.

Both the interest deduction and the tax rate have remained unchanged since the tax reform (see Fact Box 3 for a description of the interest deduction prior to the reform). However, the size of the interest deduction, 30 per cent, has been more difficult to justify from a neutrality perspective, as many forms of capital income are currently taxed at less than 30 per cent. In some cases only part of the income is taxed,<sup>4</sup> while in others tax is levied on a flat-rate return, which can be lower than the actual return.<sup>5</sup> Overall, this often means tax of around 15–20 per cent (see Table B1 of Appendix 1 and Englund, 2016). In addition, individuals only pay tax once their gains have been realised.

#### Fact Box 2. Capital deficit

The actual regulations are more complicated than households being allowed to deduct 30 per cent and 21 per cent respectively for interest expenses. The deduction is based on an individual's total capital expenses and capital income. The expenses include, inter alia, interest expenses and realised losses; while income includes capital gains, interest income and dividends. If the difference between income and expenses is negative, the individual has what is known as a 'capital deficit'. Their total income tax is then reduced by 30 per cent of this deficit up to SEK 100,000, and 21 per cent of any deficit above this figure.

#### Fact Box 3. Interest deduction before the Great Tax Reform in 1990/91

The current tax system was mostly designed as part of the Great Tax Reform in Sweden at the beginning of the 1990s. Before this tax reform, the interest deduction was much higher than it is at the moment. Back then, households were able to deduct interest expenses from their gross income. This provided many households with tax relief of approximately 50 per cent, and in some cases up to 80 per cent, of their interest costs.

For households, this combination of a high interest deduction and high interest rates led to extremely negative real interest rates (nominal interest rate minus inflation) after tax over long periods of time. Households with loans were said to be "paid to live". The fact that debt did not increase more quickly in spite of this was due to both regulated lending and high inflation, which, from a cash flow perspective, meant high interest expenses for borrowers who took out large loans.

2 Englund (2016) uses Statistics Sweden's microsimulation model FASIT and its data material in its study. See more about FASIT in Ryner (2016).

3 A change to the interest deduction can also be expected to impact household labour supply and portfolio choices as the economy adapts to a new equilibrium (see, for example, Finocchiaro et al., 2016). We do not explicitly model these changes in behaviour. However, we use empirical estimates of how households adapt their house purchases, which could indirectly involve adapting to a new equilibrium.

4 For example, this is 2/3 for closely held companies; 22/30 for own homes; and 5/6 for unlisted shares.

5 This applies, for example, to investment savings accounts, endowment insurance and pension insurance. Flat-rate taxation also changes the risk distribution between the state and the individual. See Lundberg (2017) for a discussion on whether the risk profile is relevant for the tax level.

**Fact Box 4. Household choices between a mortgage and a down payment**

Households can finance a house purchase using a loan and their own capital (down payment). The interest is the cost of the loan. In simple terms, this cost is reduced by 30 per cent as a result of the interest deduction. If households use their own capital, the cost is the return that the household would have had if they had not used their money to buy a house. The return on many kinds of savings is taxed at 20 per cent or less. This means that the tax rules are not neutral for the two sources of finance.

If the value of the interest deduction is more generous than the tax on normal kinds of savings, it becomes more attractive for leveraged households to increase their assets rather than paying off their loans. In reality, there are several factors that affect a household's choice between assets and liabilities. The lending rate and expected return on savings are two of these factors.

This deferred payment means an even lower tax level.<sup>6</sup> Furthermore, property tax (tax on ongoing returns from owned property) cannot be higher than a cap for the 2020 tax year, amounting to SEK 8,349 for a single-family house and SEK 1,429 for a tenant-owned apartment. Even if the caps are adjusted upwards every year in line with the income index, they will result in a very low average interest rate for many more expensive houses and a marginal tax rate of 0 per cent.<sup>7</sup> See also Appendix 1.

Any deviations from the neutrality between tax and deductions affect whether households decide to borrow or save. When the tax on capital income is lower than the interest deduction, households have an incentive to increase their savings instead of paying off their loans (see Fact Box 4). This can result in households having both larger assets and loans, which means that they will take more risks (see Poterba, 1991). Their net wealth (assets minus liabilities) will probably vary more, for example when interest rates and share prices change.

There are both advantages and disadvantages of households having an increasing amount of assets and liabilities, i.e. a larger balance sheet.<sup>8</sup> However, if this has been caused by distorted tax rules, it will not be effective for the economy. The tax rules encourage households to borrow. At the same time, regulations, such as the mortgage cap and amortisation requirements, aim to slow down the rate of household borrowing. In Sweden, the interest deduction also covers consumer credit, a rapidly expanding loan category, where the neutrality argument does not apply in the same way as for mortgages.

Tax neutrality can be enhanced in two ways: by raising taxation on capital income or by limiting the interest deduction. However, the socio-economic impact, including the distribution profile, will be different. In our calculations, we highlight the effects of limiting the interest deduction. Refer to the Ekonomistyrningsverket (Swedish National Financial Management Authority) (2015) for an analysis of the effects of enhancing neutrality by raising capital tax instead.

**Rule changes can affect stability**

It is important to take a long-term approach to interest deductions and a cautious approach when carrying out any reforms; this can be achieved, for example, by making gradual changes. This is particularly important when the economy is weak and the situation is uncertain, which is currently the case. Changing the interest deduction would change the rules of the game; people who have already taken out a loan have done so based on the current deduction. In terms of households with loans, the deduction affects their cash flow. It also affects house prices, as the interest deduction is one of the factors that determine the value of houses. If these effects are substantial, the changes in rules *in and of themselves* can impact financial stability. It

<sup>6</sup> The actual 'effective' tax rate can be calculated as the present value of future taxes divided by the present value of future returns. This calculation results in deferred tax at a lower effective tax rate.

<sup>7</sup> The cap for single-family houses is a tax value of SEK 1,113,200. Above this, the tax is zero.

<sup>8</sup> For example, it is an advantage if the purchase of assets provides a better spread of risk or a larger cash buffer for unforeseen events. However, it is a disadvantage if these assets comprise shares and fund units that correlate with house prices. Or that the value of assets correlates negatively with the interest on liabilities.

is therefore important for FI to gain a clear picture of how big this impact could be in order to relate them to FI's own regulations.

Limiting the interest deduction will make leveraged households more sensitive to changes in interest rates. Monetary policy will therefore have a greater impact. If both interest rates and incomes track the business cycle, a greater sensitivity to interest rates could make it easier for households to maintain their consumption at a steady level (Svensson, 2020). However, if households are subject to credit restrictions (find it difficult to get a loan) and do not have a lot of savings available, their consumption will also be affected by temporary changes in disposable income or interest expenses. For these households, greater sensitivity to interest rates could result in greater variations in their consumption. Calculations using Swedish micro data show major differences between households in terms of how sensitive they are to this *cash flow channel* (see Flodén et al., 2018). From a consumer protection perspective, it is important for people who take out a loan after a change to the interest deduction to understand the risks.

#### Fact Box 5. KALP calculation

In Sweden, some lenders use a discretionary income calculation known as KALP (an acronym from the Swedish for 'amount left over to live on') when making a credit assessment. In a KALP calculation, the actual living costs and a flat-rate estimate of other housing costs are deducted from the household's net income. In 2018 banks used a stressed mortgage rate of 7% for these calculations. A surplus in the KALP calculation indicates that the household can manage the loan in question; and lenders normally require a surplus in this calculation to approve a loan.

FI uses a standardised KALP to look at borrowers from different banks in a uniform way. This calculation is based on the average of the banks' data. One measure of vulnerability is to work out how many households that already have loans would have a deficit in the KALP calculation as a result of a change to the interest deduction. We use this calculation to see what the households' surplus would be at different interest rates (and not just at an interest rate of 7 per cent).

#### A CHANGE TO THE INTEREST DEDUCTION IMPACTS BOTH HOUSEHOLDS THAT HAVE A MORTGAGE AND THOSE TAKING OUT NEW MORTGAGES

FI's borrower-based regulations (the mortgage cap and amortisation requirements) affect households that take out *new* mortgages. In contrast, the interest deduction affects all households that have a mortgage. However, the effects of changes to the interest deduction differ between borrowers. Existing borrowers already have their loans, and a change to their interest deduction will be fully reflected in their interest costs. And if house prices change, this will also have an impact on the mortgage borrowers' net wealth. However, new borrowers can adapt the kind of house they buy, which enables them to influence the size of their loan and therefore their costs. If the buyers become less willing to pay for houses in general, this can also affect the price level. This in turn affects the size of new loans and the costs for new borrowers.

#### EFFECTS ON HOUSEHOLDS WITH EXISTING MORTGAGES

We have studied existing borrowers from two different perspectives. The first is the *cost perspective*, which shows what effect lowering the deduction will have on households' interest costs. For existing borrowers, the corresponding effect is the monthly fees for a specific loan amount and interest amount. The second is the '*vulnerability perspective*'; this shows how likely it is for a certain type of household to experience a deficit in the KALP calculation that banks normally use as part of their credit assessment process (see Fact Box 5).

#### GENERAL LOWERING OF THE DEDUCTION – EXAMPLES OF CALCULATIONS

The interest deduction can be changed either through the percentage rate or the threshold for the lower deduction.<sup>9</sup> In this analysis, we have decided to present the effects of lowering the deduction from 30 to 20 per cent. We have set the deduction above the threshold at

<sup>9</sup> The distance away from the threshold depends on the individual's capital income (see Fact Box 2). We have applied a simplifying assumption that the individual does not have any capital income.



14 per cent. This reflects the current relationship between the deduction above and below the threshold. In some cases we have also compared this change with completely abolishing the deduction.

After analysing the impact that a change in the interest deduction will have on existing borrowers, we have compared the results with an experiment where we lower the threshold to SEK 70,000. Appendix 3 of this analysis shows the results from other variations of lower deduction rates and thresholds.

The significance of the interest deduction increases with the interest rate.

The amount of the interest deduction depends on the loan amount, interest rate and deduction rate. At the current mortgage rate, which is 1.6 per cent on average, the interest cost for a loan of SEK 1 million is SEK 933 per month after the deduction (see Diagram 1). If the deduction is completely abolished, this cost increases to SEK 1,333. At 4 per cent, the cost increases to SEK 2,333 with the deduction and SEK 3,333 without it. The impact measured in SEK of the change to the interest deduction therefore increases as the interest rate increases. Due to the low interest rate, interest rate increases on their own play a comparatively significant role compared to the interest deduction.

#### Limitations

The analysis we are presenting is limited in some respects. The first limitation is computational. We have assumed that changes to the interest deduction are made at one single point in time. In practice, legislators can phase in any changes. For example, lowering the rate to 20 per cent can be carried out at 1 per cent every year for 10 years. This gives households time to adapt their behaviour, which could affect the results that we are presenting.

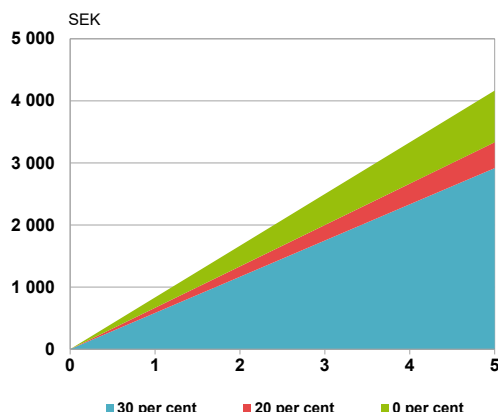
In addition, the effects of some reforms may vary as households and companies adapt their behaviour. We have considered certain dynamic effects of lowering the interest deduction when analysing the changes in behaviour that could be expected among new borrowers. However, the analysis is not exhaustive.

It is possible that some existing borrowers would use other savings to amortise existing loans to reduce their monthly costs if the interest deduction is lowered. But we do not know how many households actually have this option, which is why we have not taken this into consideration in our calculations. Micro data of household assets and loans would be required to perform a more exhaustive analysis and this data is not currently available.

Limiting the interest deduction will result in the public finances being strengthened to some extent. From a macroeconomic perspective, it is important how this additional money will be used. If the money is returned to households (through lower taxes or higher transfer payments), household disposable income will increase. This will probably result in them being able and willing to pay more for their house (and other goods and services). The effects we are presenting will still happen, but to a lesser extent.

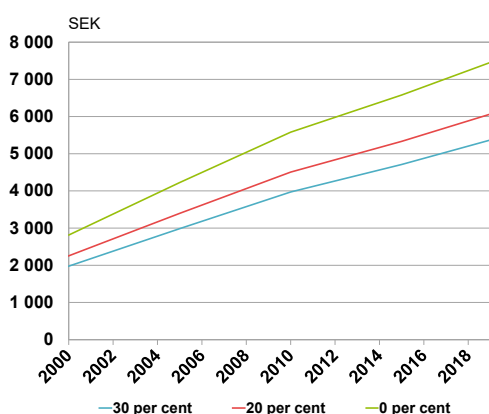
An exhaustive analysis also needs to consider the fact that changes to the interest deduction will have a wider impact as the economy adapts to a new equilibrium. For example, this could affect the households' labour supply (Justo, et al., 2019). In addition, lenders' income will decrease if borrowers borrow less (see Finocchiaro et al., 2016). The

Diagram 1. Actual interest cost per month for a loan of SEK 1 million at different interest rates and deductions



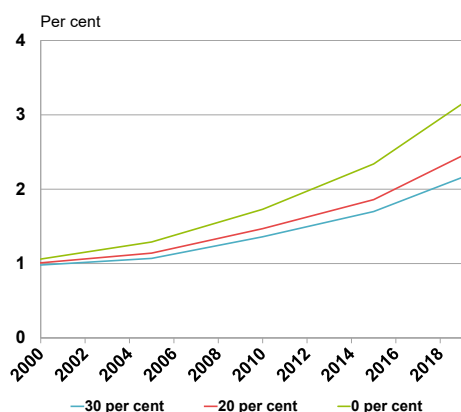
Source: FI  
Note: Enter note

Diagram 2. Current average interest payments per month for mortgages taken out at different times



Source: FI  
Note: The interest rate is 4 per cent in the calculations.

Diagram 3. The proportion of mortgage borrowers that currently have a deficit at different interest deductions; mortgages taken out at different times



Source: FI  
Note: The interest rate is 4 per cent in the calculations.

new equilibrium depends on how the state uses the budgetary capacity that will be freed up by limiting the interest deduction.

## OLDER LOANS ARE IMPACTED LESS

FI conducts annual random sampling of households that have taken out new mortgages. However, we do not have data about the stock of all existing mortgages. To gain a picture of this stock, we have calculated the expected loan amount for households that took out new mortgages between 2000 and 2019. In these calculations, we have assumed that house prices have developed in line with Statistics Sweden's property price index and that amortisation was 1.5% per year.<sup>10</sup> Both of these assumptions mean that borrowers with older loans currently have smaller loans than those with newer loans. This in turn means that households with older loans have lower interest expenses than households that have recently bought their house (Diagram 2). This means that any changes to the interest deduction will have a greater impact on households with new loans. This also applies to the proportion of households that have a deficit in the KALP calculation (Diagram 3).

## THE IMPACT ON HOUSEHOLDS THAT TOOK OUT A MORTGAGE IN 2019

We have used households that bought houses and took out loans in 2019 in order to calculate the effect on those that have taken out a mortgage before any changes to interest deductions. They have larger loans than those that took out a loan before 2019, which means that they will also be affected the most by a change to the interest deduction. This group, which we call 'existing mortgage borrowers', can then be compared with households that take out a mortgage after the change. We call this second group 'new mortgage borrowers'.

The effect of the interest deduction increases as the interest rate increases. As the current interest rate is historically low, it is likely to increase in the future. This will affect everyone who has a loan. We have therefore made calculations using two interest rates for mortgages to show the effects that a change in the interest deduction will have: 2 and 4 per cent. An interest rate of 2 per cent is close to the average rate that new mortgage borrowers received in 2019; while 4 per cent is historically a more normal level for mortgages.

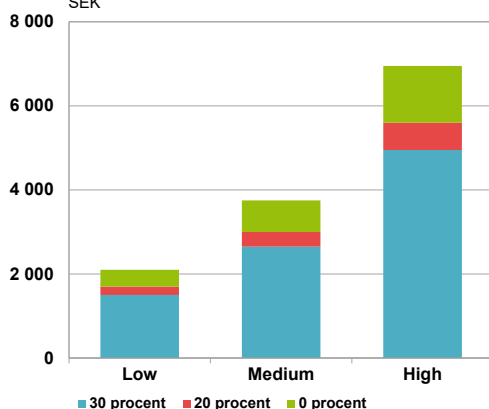
In these calculations, we have given household loans that do not use the house as collateral a rate of 3 percentage points higher than the mortgage. This difference has been calculated based on households that took out both mortgages and unsecured loans at the time of their mortgage. It is likely that there are households with loans that have higher interest rates, so our calculations may slightly underestimate interest payments.

### Lower interest deduction at the 2 per cent rate

Lowering the interest deduction to 20 per cent results in the average interest cost increasing from SEK 2,950 to SEK 3,350 per month. This cost increases the most for people with the highest incomes; they borrow the most and many of them live in Gothenburg and Stockholm

<sup>10</sup> One additional assumption is that the characteristics of borrowers are currently the same for households with older loans as those that have recently taken out a loan.

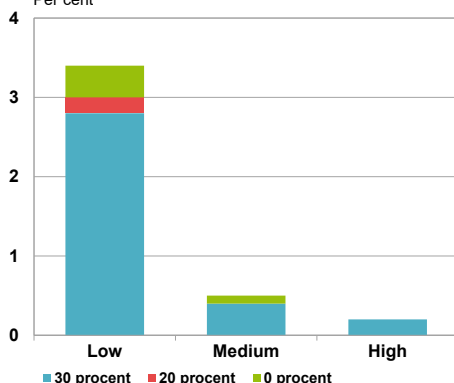
Diagram 4. Effect on interest payments of lowering the interest deduction, broken down by income, with an interest rate of 2 per cent SEK



Source: FI.

Note: We have ranked mortgage borrowers by income and divided the data material into ten equal groups in order to create deciles. 'Low income' is households in the three lowest income deciles in The Swedish Mortgage Survey 2019. 'High income' is households in the three highest income deciles, while 'medium' is the rest.

Diagram 5. Effect on the proportion with a deficit from lowering the interest deduction, broken down by income, with an interest rate of 2 per cent Per cent



Source: FI.

Note: See the note to Diagram 2.

(Diagram 4). If the interest deduction is abolished, the average cost, calculated for all borrowers, will increase to SEK 4,200.

Just over 1.1 per cent of the households that took out a mortgage in 2019 has a deficit in FI's KALP calculation with a 2 per cent interest rate using the current interest deduction. The proportion with a deficit in the KALP calculation is virtually unaffected by lowering the interest deduction to 20 per cent. If the interest deduction is completely abolished, the proportion will increase by 0.2 percentage points. The proportion increases the most among single-parent families and low-income households (Diagram 5). The reason why the proportion with a deficit is relatively limited is because interest rates (and therefore interest payments) are currently low.

### Effect of a higher interest rate

The effect of the interest deduction on borrowers increases as interest rates increase. If the interest rate increases to 4 per cent, the monthly cost will increase by an average of SEK 5,850 for households that took out a mortgage in 2019, simply because of the higher interest rate. The cost increases the most for households with a debt ratio of more than 450 per cent, those with high incomes and those living in Stockholm.<sup>11</sup> The proportion with a deficit in the KALP calculation increases to 2 per cent. And the proportion increases the most among households with a debt ratio of more than 450 per cent, the oldest mortgage borrowers, single-parent families and those with a low income.

### Lower interest deduction at the 4 per cent rate

Given how a higher interest rate (than today) affects households with mortgages, we have gone further and analysed how a change to the interest deduction will affect different household types at a 4 per cent interest rate. If the deduction is lowered to 20 per cent, the cost will increase by an average of SEK 750. The proportion of households with a deficit in the KALP calculation will increase from 2.0 per cent to 2.3 per cent.

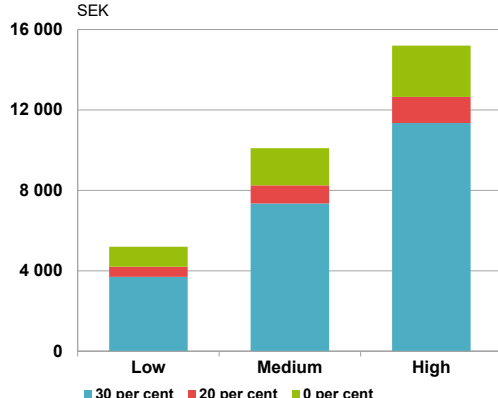
Large loans (with high debt ratios and loan-to-value ratios) involve both a high cost increase and (relative to other borrowers) a greater probability of a deficit in the KALP calculation if the deduction is lowered. For households with a debt ratio of more than 450 per cent, monthly payments increase by almost SEK 1,300 if the deduction is lowered to 20 per cent (Diagram 6). If the deduction is abolished, the costs will increase by an additional SEK 2,550.

Households with the highest income often have larger loans, which means that they pay the most in interest. They therefore have the highest interest deduction (Diagram 7). Their cash flow will be affected the most if the interest deduction is lowered. This is in line with the results from Englund (2016). Lowering the interest deduction has a comparatively small impact on low-income households. However, the probability of having a deficit increases considerably more than for high-income households as they often have a smaller surplus in the KALP calculation. If the deduction is lowered to 20 per cent, the proportion of low-income households with a deficit

<sup>11</sup> We consistently calculate the debt ratio as a household's total mortgage divided by total income before tax.



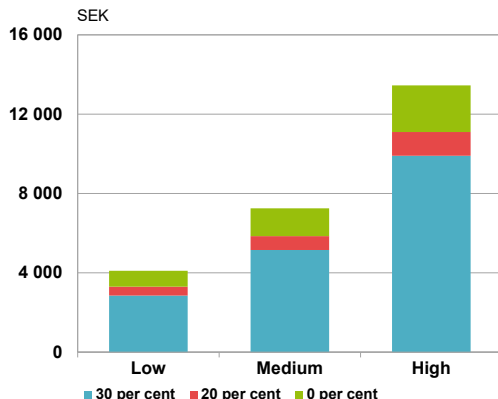
Diagram 6. Effect on interest payments of lowering the interest deduction, broken down by debt ratio, with an interest rate of 4%  
SEK



Source: FI

Note: Enter note

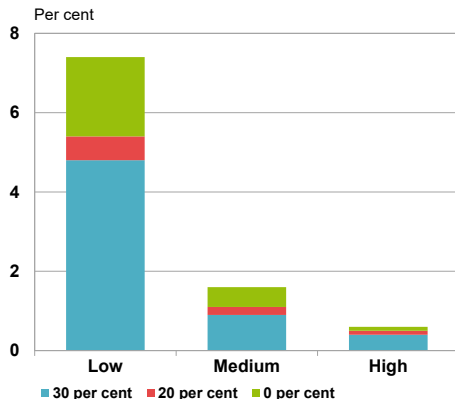
Diagram 7. Effect on interest payments of lowering the interest deduction, broken down by income, with an interest rate of 4%  
SEK



Source: FI

Note: See the note to Diagram 2.

Diagram 8. Proportion with a deficit at different interest deductions, broken down by income, with an interest rate of 4 per cent  
Per cent



Source: FI

Note: See the note to Diagram 2.

will increase by 0.6 percentage points (Diagram 8).<sup>12</sup> The increase is barely noticeable among high-income households.

In addition, if the interest deduction is lowered to 20 per cent, the cost will increase the most in Stockholm, while the proportion of households with a deficit will increase the most in Malmö (see Table B3.2 in Appendix 3). The cost will also increase the most among middle-aged mortgage borrowers as they have the largest loans. This is qualitatively in line with Englund (2016). The increase in the proportion of households with a deficit is the same for all age groups. The interest deduction offers the highest value in SEK for two-person households. However, single people run the greatest risk of having a deficit with the same reduction.

## EFFECT ON HOUSEHOLDS THAT TOOK OUT CONSUMER CREDIT IN 2018

Consumer credit is normally less than mortgages, but it often has a high interest rate (and a quick amortisation rate), so any changes to the conditions can have a major impact on a borrower's finances.<sup>13</sup> Small consumer loans do not incur such high interest expenses, so the effect from lowering the interest deduction is not as high for this kind of credit (Table 1). This applies at both the current interest rate<sup>14</sup> and if the interest rate increases by 2 percentage points. Borrowers who take out large consumer loans are affected the most. Borrowers who have more than SEK 0.5 million in consumer credit in 2018 paid an average of SEK 3,800 a month in interest, which is almost SEK 1,000 more than payments for the average mortgage. Their interest expenses will increase by SEK 600 a month if the interest deduction is lowered to 20 per cent. If the interest rate is 2 per cent higher, the cost increases by SEK 2,000 because of the interest rate and an additional SEK 1,700 because of the lower deduction.

People who have a lot of consumer credit and a mortgage are affected the most.<sup>15</sup> Households that took out new consumer credit in 2018 and had a mortgage of more than SEK 2 million and consumer credit of more than SEK 300,000 paid SEK 18,000 a month in interest payments at the current interest rate and with the current interest deduction. If the interest deduction is lowered to 20 per cent, their interest cost will be SEK 21,000.

In total, the calculations show that consumer credit can involve high interest payments and a major impact on the borrower. Changing the interest deduction is therefore an action aimed at all borrowers.

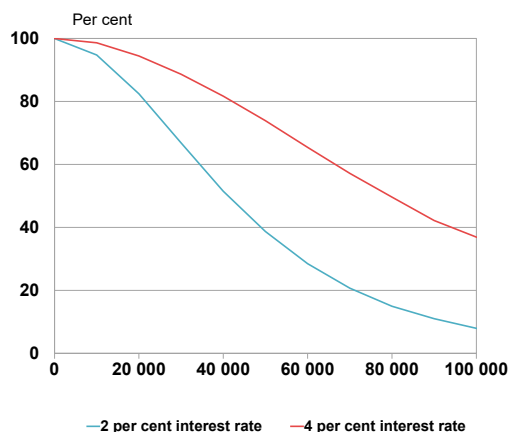
<sup>12</sup> Low incomes here are represented by the lowest 30 per cent of incomes.

<sup>13</sup> FI is not able to combine data of mortgage loans and consumer credit. This is why the analysis of people who took out consumer credit in 2018 is independent from the analysis of mortgage borrowers. We use the term 'consumer credit' for all loans that do not use a house as collateral. Although consumer credit only accounts for 18 per cent of loans, it accounts for almost half of the total interest payments for households in Sweden.

<sup>14</sup> We have used the agreed interest rate for new consumer credit as the actual interest rate, which is 2 per cent for mortgages and 7 per cent for existing consumer credit (the average in the *Konsumtionslåneundersökning* (Consumer Credit Survey 2018)).

<sup>15</sup> See Finansinspektionen (2019b) for more information about the monthly costs and deficit of borrowers with consumer credit in the event of economic stress.

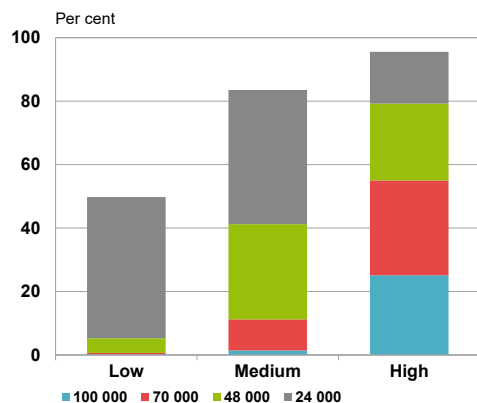
Diagram 9. Proportion of new mortgage borrowers above the threshold; different thresholds



Source: FI's Mortgage Survey 2019.

Note: Proportion of borrowers in 2019 whose interest expenses are above the threshold. Interest expenses are calculated on all loans, including consumer credit.

Diagram 10. Proportion of households across different thresholds, broken down by income



Source: FI

Note: The interest rate is 2 per cent in the calculations. See also the note to Diagram 2.

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**Table 1:** Monthly interest cost for consumer credit at different interest deductions, broken down by total loan burden, excluding mortgages (SEK)

		Actual interest rate			Actual interest rate + 2 percentage points		
	Deduction	30	20	0	30	20	0
Loan burden	0-10	35	40	50	42	53	59
	10-100	170	190	240	220	280	310
	100-500	1,000	1,100	1,400	1500	1900	2100
	>500	3,800	4,400	5,500	5,800	7,500	8,300

Source: *Konsumtionslåneundersökning 2018* (Consumer Credit Survey 2018), FI  
Note: The loan burden is expressed in SEK thousand.

## CHANGE TO THE THRESHOLD

As a comparison, we have also calculated the effects of lowering the threshold, while keeping the interest deduction unchanged. However, our data can only give us part of the total picture. Data on an individual's other (positive and negative) capital income is required to perform a precise calculation, as it is the net of all of these items that form the basis for the deduction. However, as many households do not have much capital income, our calculations can still be used for comparison purposes.

At an interest rate of 2 per cent, just under 8 per cent of new mortgage borrowers (in our Mortgage Survey 2019) have interest expenses above the current threshold of SEK 100,000 (Diagram 5). Their interest expenses before tax account for 20 per cent of the total interest expenses for all borrowers. If the threshold is SEK 70,000, just under 21 per cent of borrowers and 40 per cent of total interest expenses will end up above the threshold.

Reducing the threshold without changing the interest deduction rate has a relatively minor impact. This is because relatively few individuals have interest expenses above the current threshold of SEK 100,000, while the lower deduction value (21 per cent instead of 30 per cent) only refers to the amount that exceeds the threshold.

Households that are affected by changes to the threshold typically have a high income. Fewer than 1 per cent of low-income households have a cost above the threshold (Diagram 10). However, more than 55 per cent of borrowers with a high income end up being above the threshold of SEK 70,000 in this scenario.

At higher interest rates, far more people would be affected by a lower threshold. If we set the threshold at SEK 70,000, with an interest rate of 4 per cent, 57 per cent of new borrowers in 2019 will end up above the threshold. However, more precise calculations of the distribution effects should be performed using Statistics Sweden's micro-simulation model FASIT; this is outside the remit of this FI analysis.

## EXISTING BORROWERS MAY BECOME MORE VULNERABLE IF THE DEDUCTION IS LOWERED

Existing borrowers may become more vulnerable to economic disruptions if the interest deduction is lowered. This is because it could result in their cash flows declining. How much more vulnerable

they will be depends on the interest rate, how much the deduction is lowered, how large their loans are compared to their income, and whether they have any savings that can be used for amortisation. Borrowers who do not have a deficit in their KALP calculations may also have to reduce their consumption. In addition, the net wealth of home owners may fall if the price of their houses falls. These changes could affect the real economy.

## Effect on new lending and house prices

This section presents how the loan burden of *new mortgage borrowers* will be affected by lowering the interest deduction.<sup>16</sup> As before, this analysis is based on data from 2019. However, we have now used this data as the basis for a hypothetical calculation where both house prices and the amount households borrow adapt to changes in the interest deduction rules.

Lowering the interest deduction may make it more difficult for some households to get a new mortgage if we assume that borrowers will use the same stressed mortgage rate as today. If the interest deduction is lowered, household borrowing costs will increase, which will result in more borrowers having a deficit in their KALP calculation. However, this effect is somewhat counteracted by a reduction in house prices if the interest deduction is lowered.

### LOWERING THE INTEREST DEDUCTION RESULTS IN LOWER HOUSE PRICES

Loans are an important source of financing when buying a house. Limiting the interest deduction, which will increase a borrower's cost for a specific loan, may therefore affect their willingness to pay for houses, which will reduce house prices. We have calculated this change in prices in a few different ways. We have used two partial estimates and a Bayesian vector autoregressive (VAR) model.

The first partial estimate comes from FI's household data and shows *the initial effect* on how much cheaper the houses will be that new borrowers would buy. Cheaper houses could mean smaller properties or properties that are not in such central locations. However, it could also indicate that the prices are falling.<sup>17</sup> These estimates provide an elasticity between debt payment (interest plus amortisation) and purchase prices (see Finansinspektionen, 2017b). This elasticity indicates that a mortgage borrower, immediately after the change, will buy a house that is 0.15 per cent cheaper if their debt payments increase by 1 per cent. However, this elasticity may underestimate how much cheaper the houses will be that borrowers will buy. This is because it has been calculated based on how changes to amortisation affect the demand for houses. Unlike interest expenses, amortisation is

<sup>16</sup> It is difficult to calculate how the interest deduction will affect new borrowers that take out consumer credit. This is because we do not know how changes to consumer credit conditions will affect the demand for new loans. We may be able to make an evaluation of the changes to the rules for high-cost credit once we have completed the Consumer Credit Survey 2020. This analysis is therefore limited to data from FI's Mortgage Survey.

<sup>17</sup> Using certain assumptions, we can equate the prices that new mortgage borrowers pay with the prices of their houses. One assumption is that the housing stock is constant in the short term. If everyone pays 1 per cent less, house prices will fall by 1 per cent.

Table 2. Average reduction in purchase prices for houses due to a lower interest deduction

Per cent			
Elasticity at		User cost	
Interest	Interest		
2%	4%		
30	0	0*	0
20	-2.5	-6.2	-4.4
0	-5.6	-16.6	-15.0

Source: FI

Note: Note: The elasticity provides the initial change in the price that new borrowers pay for their houses. 0\* means that the other figures are compared with the current deduction at a 4% interest rate.

Table 3. Model forecasts for the differences in levels of house prices and mortgages with different interest deductions

Percentage deviation from the present situation				
Year	House prices		Mortgage	
	20%	0%	20%	0%
1	-0.4	-1.1	-0.2	-0.4
2	-0.6	-1.7	-0.4	-0.7
3	-0.8	-2.4	-0.5	-1.1
4	-1.1	-3.2	-0.8	-1.5

Source: FI

Note: This table shows the percentage deviations in price and debt levels compared with the current interest deduction. The calculations use the current interest rate with FI's Bayesian VAR model.

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not a cost, but a saving. However, there are also households that do not need to borrow money to buy a house. They are not affected by the interest deduction. This means that the elasticity would instead result in the price effect for some new buyers being overestimated.

We have also estimated the price effect by keeping living expenses unchanged using a user cost calculation (see Poterba, 1984). This calculation values a house as the discounted present value of future net income. In this instance, net income equates to the value of living in the house (the rental costs a home owner does not have to pay) minus the costs from owning the house.

In our calculation, this cost is determined by the capital cost after tax, a risk premium, an expected increase in value, running and maintenance costs, and property tax. The hypothesis behind this calculation is that when costs increase or decrease, the price adapts, so the value from living in the house remains unchanged.<sup>18</sup> In the calculations, we have set the discount rate at 4 per cent.<sup>19</sup> We have calculated the effects of lowering the interest deduction from 30 per cent to 20 per cent, but have taken into consideration that some of the purchases are made using people's own savings. This reduces the impact on the prices. In other respects, we have used the same parameter values as Englund (2016). These calculations are described in more detail in Appendix 2.

The user cost approach can be interpreted as a calculation where households are fully rational and not restricted in their ability to take out loans, as they value their cash flows at a low discount rate. And we interpret the debt payment approach as meaning that households only care about short-term payment flows or are restricted in their ability to take out loans.

At the current interest rate, the initial effect, using the elasticity, is that households will buy houses that are 2.5 per cent cheaper in the short term if the interest deduction is lowered by 10 percentage points (Table 2). If the interest rate is 4 per cent, prices will be affected slightly more by lowering the interest deduction. In addition, prices will fall as a result of the higher interest rate.

The user cost calculation shows that the prices will fall by just over 4 per cent if the interest deduction is lowered to 20 per cent. This is approximately the same order of magnitude as if the borrowers (hypothetically) wanted to pay the same amount of their income in interest and amortisation as if the deduction had not been lowered. If the interest deduction is completely abolished, the prices will fall by around 15 per cent according to the user cost calculation.

We have also used a Bayesian VAR model (see Finansinspektionen, 2015). This model provides coherent short-term forecasts for household expectations for the future, house prices (property price index), mortgages and mortgage rates. Here we have based the model on the future development of the interest rate that households pay using different interest deductions. The model shows that the price

<sup>18</sup> How much and how quickly these costs are actually capitalised in these prices is an open question. Elinder and Persson (2017) find, for example, that lowering the property tax in 2007 had no major effect on house prices, except for the most expensive houses.

<sup>19</sup> The discount rate refers to the long-term cost of capital. As a basis for the discount rate, we have assumed that the risk-free interest rate is 2 per cent, the risk premium 0.5 per cent and the mortgage margin is 1.5 per cent.

level will fall by 0.4 per cent after one year if the interest deduction is lowered to 20 per cent (Table 3). This is a lower estimate than in the elasticity calculation. This may be because the model only takes into consideration single-family houses, while elasticity is based on both single-family houses and tenant-owned apartments.

After four years, prices will be just over 1 per cent lower than with the current deduction. If the deduction is abolished, it will result in prices being 3 per cent lower after four years. According to the model, lending will be reduced less than the prices.

#### **A lower interest deduction benefits households that will buy houses**

We have shown that new mortgage borrowers will probably buy cheaper houses if the interest deduction is lowered. This means that households that buy a house after the interest deduction is lowered will pay less for a house than a borrower that has bought a house with the current interest deduction.<sup>20</sup> Our estimated elasticities show small effects at the current interest rate. Lowering the interest deduction will mean that households that buy new houses will pay less (using the elasticity calculation) than a household that is already on the market (and bought a house between 2016 and 2018). If the interest rate is 4 per cent, the difference will be greater. Both interest rate increases and a lower interest deduction will result in households outside the housing market being able to buy houses more cheaply. But wealth will decrease for households that already own a house.

#### **Lower prices lead to fewer houses in the long run**

If the interest deduction is lowered to 20 per cent, the prices could fall by between 1 and 5 per cent (depending on the analysis horizon and estimation method). At the same time, lower prices make it less attractive to build new houses. Caldera Sánchez and Johansson (2011) have estimated that 1 per cent higher prices lead to 1.4 per cent higher construction investments in the long term. This elasticity means that if the prices fall by 1 per cent, approximately 420 fewer houses will be built per year.<sup>21</sup> If house prices are 5 per cent lower, 2,100 fewer houses will be built. Caldera Sánchez and Johansson have also estimated how the stock affects prices. Prices will be expected to increase by 0.1 per cent if 2,100 fewer houses are built, compared with a trend where fewer houses are not built.

### **VIRTUALLY EVERY HOUSEHOLD CAN STILL BUY A HOUSE**

Since lowering the interest deduction results in an increase in the cost of houses, it could be more difficult for some households to obtain a surplus in the KALP calculation.<sup>22</sup> This could result in them not being granted the same mortgage amount.

If the deduction is lowered to 20 per cent, the average monthly cost in FI's KALP calculation will increase by almost SEK 1,200 for new mortgage borrowers if they buy the same house, pay the same price

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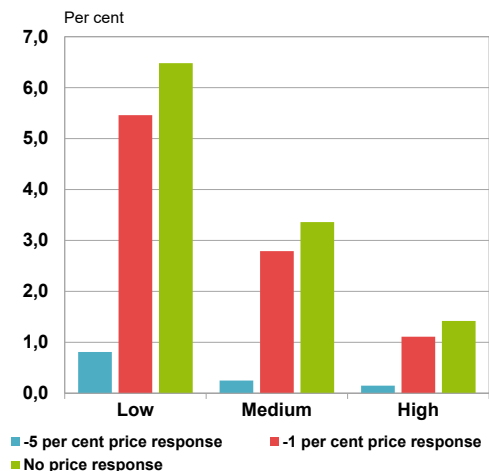
20 For the sake of comparison, we can compare a household that bought a house just before (the announcement of) a lower interest deduction with another household that bought a house just after.

21 We have equated price increases and price reductions in the elasticity calculation. We have also assumed that approximately 30,000 homes will be built each year. This is the average for the last 15 years.

22 The stressed mortgage rate in the calculation is 7 per cent. This is the average interest rate that the major banks used for their credit assessments in 2018.



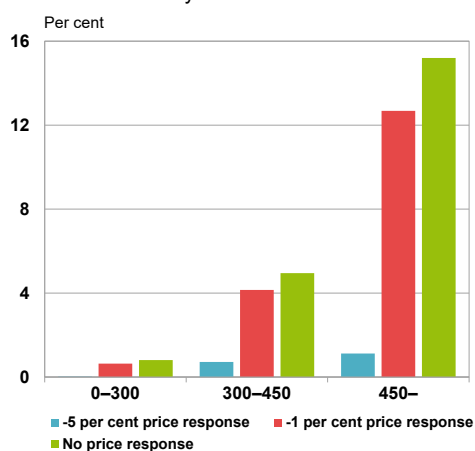
Diagram 11. Increased proportion of new mortgage borrowers with a deficit if the interest deduction is lowered to 20 per cent, broken down by income



Source: FI

Note: The diagram shows the proportion broken down by loan-to-value ratio and price response. In the calculations, we have used a stressed mortgage rate of 7%.

Diagram 12. Increased proportion of new mortgage borrowers with a deficit if the interest deduction is lowered to 20 per cent, broken down by debt ratio



Source: FI

Note: The diagram shows the proportion broken down by loan-to-value ratio and price response. In the calculations, we have used a stressed mortgage rate of 7%.

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and borrow the same amount as in 2019.<sup>23</sup> This in turn means that almost 4 percentage points more borrowers will have a deficit in their KALP calculation with the loans observed in 2019.<sup>24</sup> These households would probably not have been allowed to borrow as much if the interest deduction was 20 per cent.

It is primarily households with low incomes and large loans relative to the value of their houses where the proportion with a deficit in the KALP calculation increases if the deduction is lowered (Diagrams 11 and 12).<sup>25</sup> In addition, the proportion increases the most among young people and single people, compared with other age groups and households with children. This is an *indication* that these groups may find it more difficult to buy the same house if the interest deduction is lowered.

The calculations therefore show that 96 per cent of those who bought a house in 2019 could have bought the same house even if the interest deduction was 20 per cent and the prices remained unchanged. These results should not be over-interpreted. As the prices are likely to fall due to a lower interest deduction, fewer households will find it difficult to buy the same house. If the prices are 5 per cent lower, monthly costs will increase by an average of SEK 350, with an interest deduction of 20 per cent. In this scenario, 0.4 per cent of those who bought a house in 2019 would not be able to buy the same house.

The stressed mortgage rate in the KALP calculation is used to create a general buffer for borrowers to manage higher actual interest rates (and in practice a lower interest deduction as well) and other disruptions to household finances. We do not know what the banks would do with the stressed mortgage rate if the interest deduction changes. The calculations above are based on the stressed mortgage rate remaining the same. If the banks adjust the stressed mortgage rate (in the KALP calculation) so that the rate after deductions is 5 per cent (which is the same as today), there will not be any increase in borrowers with a deficit in the KALP calculation if the deduction is abolished. However, in this scenario, the resilience of new borrowers will decrease as they have less of a buffer for an increase in the actual interest rate. Households will also have lower resilience to a loss of income.

## NEW MORTGAGE BORROWERS BORROW LESS

If the cost of borrowing increases, new mortgage borrowers will buy cheaper houses and borrow less. This may also be the case if the increase in expenses is primarily cash-related and short term, as with the amortisation requirements (see Finansinspektionen, 2017, and Andersson and Aranki, 2019). In this section we have calculated how much less home buyers will borrow with a similar elasticity as before when we calculated the price effect. Households are affected more if the interest rate is high, and less if they amortise a lot. The estimated elasticity means that new borrowers will borrow 0.3 per cent less if the loan payment (interest rate plus amortisation) increase by

<sup>23</sup> We use households that took out a new mortgage in 2018 as an approximation for new mortgage borrowers.

<sup>24</sup> Approximately 6 per cent of households in the Mortgage Survey 2018 have a deficit in FI's KALP calculation at an interest rate of 7 per cent.

<sup>25</sup> See also Diagram O1 in Appendix 3.

Table 4. Average initial reduction in mortgages due to a lower interest deduction  
EUR million and per cent

	Interest 2%		Interest 4%	
	Mortgage	LTI	Mortgage	LTI
<b>0.3</b>	2.21	282	2.02	259
<b>0.2</b>	2.11	268	1.89	243
	(-4.9)		(-6.9)	
<b>0</b>	1.97	252	1.68	216
	(-11.2)		(-17.7)	

Source: FI

Note: LTI is a debt ratio calculated as the mortgage divided by gross income. We have used estimated elasticities between cost increases and loans. Borrowers are also allowed to pay 25 per cent of their income in interest and amortisation. Figures in brackets show the percentage deviation from the current interest deduction and different interest rates.

#### Fact Box 6. FI's borrower-based regulations

According to the 2012 mortgage cap, new loans that use a house as collateral should not exceed 85% of the house's value. This regulation aims to counteract unhealthy lending practices and strengthen consumer protection.

The amortisation requirement, which FI introduced in 2016, aims to prevent macroeconomic and financial stability risks that are associated with high household debt. This requirement means that the households with a mortgage in excess of 50 per cent of the value of the house must amortise at least 1 per cent of the loan every year. If this loan exceeds 70 per cent of the value of the house, the household must amortise at least 2 per cent per year. In the long term the amortisation requirement is expected to reduce the proportion of highly leveraged households and therefore reduce household debt. This makes households more resilient to disruptions.

Under the stricter amortisation requirement from 2018, new borrowers with mortgages that exceed 450 per cent of their gross income must amortise at least 1 per cent of their mortgage in addition to the amortisation required under the first amortisation requirement. Before introducing the stricter amortisation requirement, FI predicted that households with a new mortgage would buy less expensive houses and borrow less as a result of the regulation. This would immediately make these households less vulnerable. Amortising at a faster rate would also reduce their vulnerability over time.

1 per cent.<sup>26</sup> We also allow household debt payments to increase to 25 per cent of their disposable income.<sup>27</sup>

At an interest rate of 2 per cent, the average new mortgage would have been SEK 2.21 million in 2019 (see Table 4). If the interest deduction had been 20 per cent, the elasticity calculation would have resulted in households borrowing SEK 2.11 million instead. According to a calculation with the interest deduction abolished, they would have borrowed SEK 1.97 million.

At an interest rate of 4 per cent, the average new mortgage would have been SEK 2.02 million with the current interest deduction. If the interest deduction had been abolished, it would have been SEK 1.68 million instead. This is almost 17 per cent less than with the current interest deduction (at an interest rate of 4 per cent) and 24 per cent less than if the interest rate had been 2 per cent and with the current deduction. A higher interest rate and a lower deduction will therefore result in households borrowing much less than they do today.

## Interest deduction, vulnerability and FI's regulations

This section links a change in the interest deduction with the borrowers' vulnerability and FI's borrower-based measures. The interest deduction also affects the real economy. What is most affected is household consumption and house prices. This can partly be counteracted by adapting fiscal policy or monetary policy. If the interest deduction is limited step by step over a long period of time, it enables consumption and house prices to gradually adapt. This also reduces the risk that limiting the interest deduction will have clearly negative effects on individual borrowers and the stability of the financial system. The factors that are most important for FI are the effects on borrowers and stability.

The coronavirus, SARS-CoV-2, and the measures taken to slow down the spread of infection caused major economic disruptions in Sweden and the rest of the world in 2020. Fiscal policy is currently extremely expansionary in order to support a recovery. Reforms that slow down household demand could have an unwanted effect. However, limiting the interest deduction takes time as income tax is calculated on an annual basis and no change will be made until the turn of a year. A general limitation could take place at the turn of 2021/2022 at the earliest. Limitations could also be made gradually over the course of several years. The overall impact on household demand depends on how the state uses the budgetary scope that is freed up if the interest deduction is limited.

### New mortgage borrowers' vulnerability

One reason for FI's borrower-based regulations is to prevent new mortgage borrowers from taking out such large loans that their debt ratios or loan-to-value ratios are excessively high (see Fact Box 6). The first amortisation requirement resulted in a lower proportion taking out new mortgages with a loan-to-value ratio of more than 50

<sup>26</sup> The elasticity is taken from Finansinspektionen (2017) and Andersson and Aranki (2019).

<sup>27</sup> In the Mortgage Survey 2018, households pay an average of 12.8 per cent of their disposable income in interest and amortisation. Just over 5 per cent pay 25 per cent of their income in interest and amortisation.

Table 5. Proportion of new mortgage borrowers with high debt ratios or loan-to-value ratios  
Share in per cent

		Interest 2%		Interest 4%	
		LTI	LTV	LTI	LTV
2015	30	16.2	51.3		
2016	30	14.7	46.7		
2017	30	13.5	43.1		
2018	30	5.8	47.3		
2019	30	5.8	49.0	2.4	43.3
2019	20	4.4	45.0	1.2	36.5

Source: FI

Note: *Numbers in italics* are estimated values. A high LTI means a debt to income ratio of more than 450 per cent, while a high LTV loan-to-value ratio is more than 70 per cent. The debt ratio is based on the total loans of new mortgage borrowers in 2015 and 2016, and total mortgages in 2017, 2018 and 2019.

and 70 per cent (see Finansinspektionen, 2017a). And the stricter amortisation requirement halved the proportion of new borrowers with a debt ratio of more than 450 per cent (see Andersson and Aranki, 2019).<sup>28</sup> One important difference between these measures and limiting the interest deduction is that lowering the interest deduction affects everyone with loans immediately, while the mortgage cap and the amortisation requirement only have a direct impact on those who took out loans after the regulations were introduced. In that respect, limiting the interest deduction will mean that the cost of curbing household's increasing indebtedness will be borne by all borrowers.

At the current interest rate (2 per cent), completely abolishing the interest deduction will reduce the size of new mortgages by 5.6 per cent compared with the current deduction (see Table 4). This corresponds to almost half the impact that the first amortisation requirement had on new lending, or just over one third of the total impact of both amortisation requirements.

Table 5 shows how a lower interest deduction will affect the debt ratio of new mortgage borrowers. At a rate of 2 per cent, the average debt ratio among new mortgage borrowers will fall from 282 to 268 per cent if the interest deduction is lowered by 10 percentage points. The effect is almost the same as the stricter amortisation requirement (see Andersson and Aranki, 2019). If the interest deduction is completely abolished at the current interest rate, it will affect the proportion of new mortgage borrowers with high debt ratios or loan-to-value ratios by about as much as the first amortisation requirement.

A lower interest deduction reduces the proportion of new mortgage borrowers with large loans more at a higher interest rate. If the interest rate is 4 per cent, debt ratios will be 22 percentage points lower. They will fall by a further 43 percentage points if the interest deduction is abolished in this scenario. The first amortisation requirement reduced debt ratios by 23 percentage points.

The proportion of new mortgage borrowers with a debt ratio of more than 450 per cent will fall from 5.7 to 4.4 per cent if the interest deduction is lowered to 20 per cent (Table 5). This is due to the fact that loan payments will increase. If the interest rate is higher, the proportion will fall by more. The proportion of new borrowers with high debt ratios will therefore be virtually non-existent at an interest rate of 4 per cent and a lower interest deduction. In addition the stricter amortisation requirement will act like a debt ratio brake (which happens if lending increases more quickly than income) to an even greater extent.

### Lower interest deductions and FI's regulations slow down new lending

This section makes a direct comparison between the interest deduction and FI's borrower regulations. We can only compare how new lending is affected as FI's borrower-based regulations only affect new borrowers.

#### *The interest deduction and mortgage cap*

The mortgage cap limits the part of the house's value that a household can borrow with the house as collateral to 85 per cent. In addition to

<sup>28</sup> We consistently use debt ratios that are calculated as mortgages divided by income before tax.

this, households can take out an unsecured loan if the borrower's credit rating allows.

A lower interest deduction leads to lower house prices. For first-time buyers, this means that a deposit amount will be enough for a larger proportion of the house purchase, provided that they buy the same house. This means that a lower interest deduction will probably result in lower loan-to-value ratios and that fewer households will need to borrow more than 85 per cent of the value of the house.

The way that those selling and buying houses will be affected is not as clear. Households that buy more expensive houses (than they sell for) will receive more capital that can be used as a deposit (than with the current deduction) for the new purchase. This is because the more expensive house is expected to go down more in price than the cheaper one. However, households that buy cheaper than they sell for will receive less capital for a deposit for the new purchase compared with what they would have received with the current interest deduction.

#### *The interest deduction and amortisation requirements*

There are similarities between how the interest deduction and amortisation requirements curb household loans. However, there are also differences. A lower interest deduction reduces the cash flows of borrowers. This is also true of the amortisation requirements in the short term. This means that both of these regulations can make mortgage borrowers borrow less and buy cheaper houses.

One difference between a change in the interest deduction and the amortisation requirements is that the interest deduction affects the cost of living, while amortisation is a saving that reduces household loans in the long term. In addition, when a mortgage is paid off to below one of the thresholds for the requirements, the household can decide to no longer follow the amortisation requirement, if this is approved by the lender. The household can then improve its cash flow and its resilience compared with not amortising. This does not apply to the interest deduction.

Another difference between the interest deduction and amortisation requirements is that the interest deduction affects existing borrowers. The amortisation requirements do not have the same effect. Over time, the amortisation requirements have the potential to affect an increasing number of borrowers. However, households that borrow a little will not need to amortise. It is households that borrow a lot in relation to the value of the house and their income that have to amortise in accordance with the requirements. This means that the amortisation requirements are risk-based. The interest deduction is not risk-based *to the same extent* as it applies to all borrowers. However, those who borrow the most are affected the most by the interest deduction.

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## Appendix 1: Interest deduction for households

Table B1 shows the tax rates for some of the most common forms of capital income. 'Tax rate in practice' refers to tax in relation to income. In the table, capital income is divided into three groups. The first group is capital income that is taxed in the conventional way. For this income, tax is calculated as a proportion of the actual capital income that has been realised. The tax rate is formally 30 per cent for this income. However, it is common for legislation to stipulate that only part of this income has to be taxed; this is known as *kvotering* in Sweden and the tax on this reduced amount is 30 per cent. This is the *nominal* tax rate on capital income. So, for example, let us assume that only five sixths of the income from unlisted shares is subject to taxation. This means that the tax in practice, so tax as a proportion of income, will be 25 per cent ( $5/6 \times 30 = 25$  per cent) in this scenario.

In addition a lot of capital income is not included at its actual value when calculating tax. Instead, the Swedish Tax Agency makes a flat-rate calculation for the amount of income. For example, assets in an investment savings account (ISA) are taxed at a flat rate.<sup>29</sup> In 2019 this meant that assets in an ISA were taxed at 0.447 per cent of the balance in the account.<sup>30</sup> If the assets in an ISA are expected to increase by 2–4 per cent a year in value, this will result in an average tax of roughly 10–20 per cent.

To ensure that the interest deduction is neutral, the deduction has to be as much as the taxation on capital income. As shown in Table B1, taxation on capital income varies significantly. Just over 80 per cent of household loans are secured with a house as collateral. If the interest deduction corresponds to the taxation on the return of houses, the interest deduction will, in practice, be neutral.

Return on houses comprises two components: an increase in value and the benefits of owner-occupancy. This means that taxation amounts to the total of the taxation on both these components. The increase in value is taxed at 22 per cent, while the return is taxed at between 5 per cent and 30 per cent. It is difficult to achieve a completely neutral interest deduction. This is because the return is taxed differently. However, the current interest deduction is clearly above the neutral level. Table 1 suggests that a neutral level for the interest deduction would currently be around 20 per cent.<sup>31</sup>

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29 A tax of 30 per cent is levied on a flat-rate income that is calculated at the central government borrowing rate on 30 November last year plus one percentage point. The central government borrowing rate is an interest rate that tracks the central government's borrowing costs and stood at 0.49 per cent on 30 November.

30  $(0.0049 + 0.01) \times 0.3 = 0.000447$ .

31 Alternatively, neutrality could be increased by having higher effective tax on capital income

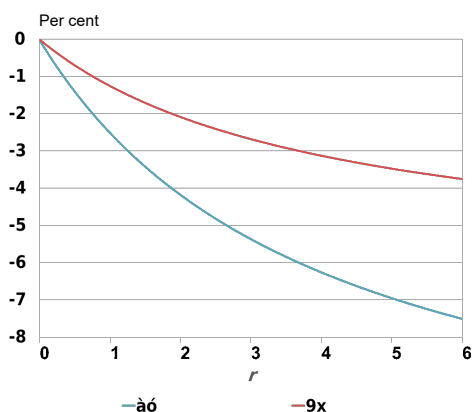
**Table B1.1.** Tax on capital income – some important examples

Income type	Tax rate (Per cent)
<b>Conventional taxation</b>	
Interest on bank accounts	30
Return on directly owned shares in listed companies	30
Return on directly owned shares in unlisted companies	25
Return on shares in closely held companies ('3:12')	20
Realised profit from the sale of a house	22
<b>Flat-rate taxation*</b>	
Return on endowment insurance	10–20
Return on investment savings accounts	10–20
Return on occupational pension savings	7– 15
Direct return, owner-occupancy, single-family houses, worth up to approx. SEK 1.3 million	30
<b>Untaxed</b>	
Direct return, owner-occupancy, to the extent that the market value exceeds approximately SEK 1.3 million	0
Direct return, owner-occupancy, tenant-owned apartments	0
Premium pension savings	0

Source: Englund (2016), Ministry of Finance's Calculation Conventions for 2020 and FI.

Note: Assets taxed at a flat rate are taxed on a proportion of the asset's value. Depending on the asset's return, the tax (expressed as a percentage of the return on the asset) may vary. The figures in this table are therefore based on the tax for an average return.

Diagram B2.1 Sensitivity analysis for price effect



Source: FI  
Note: Enter note

## Appendix 2: Calculations of house prices

We use a few different methods to calculate how a change to the interest deduction may affect house prices. One of the calculations is a user cost approach that is based on different costs from owning a house.

### USER COST CALCULATION

One established method for calculating the price effect of measures that affect the cost of owning a house is the ‘user cost method’. This approach calculates this price as the difference between the present value of the future benefits of owner-occupancy minus the present value of future user costs from owning the house. User costs are costs for financing the purchase and the running and maintenance costs.

We follow the same notation as Englund (2016) and state the connection between the price  $P$  and user costs as

$$(B2.1) \quad P_t = \frac{R_t}{r(1-\tau)+\gamma-g+\theta+m}$$

where  $R$  is the value of benefits of owner-occupancy (corresponding to the rental value). The terms in the denominator describe the cost of owning a house: the cost of capital after tax  $r(1-\tau)$ , where  $\tau$  is the interest deduction/tax rate, a risk premium  $\gamma$ , expected increase in value  $g$ , running and maintenance costs  $m$ , as well as current property taxation  $\theta$ .

Based on the simplifying assumption that a reform does not affect other parameters, the impact of a reform that affects user costs can be calculated using equation B2.1.

Saying that reforms do not affect other parameters is a simplifying assumption. In practice, reforms will probably affect construction, which in turn will affect future prices and therefore the expected rate of increase in value  $g$ . As a result the price effect will be smaller, in absolute numbers, than if we disregard this effect.

In addition, if reforms are, for example, unexpected, they can create uncertainty about the long-term rules in the housing markets. Greater uncertainty about the future value would then justify a higher risk premium. This has a negative effect on prices.

Diagram B2.1 shows the price effects of limiting the interest deduction from 30 to 20 per cent. User cost calculations are sensitive to assumptions about the various parameters. As a kind of sensitivity analysis, we have therefore reported the calculations for a few different sets of assumptions.

The interest rate  $r$  should reflect long-term expectations of the cost of financing. To make an estimate of the current interest rate situation, we have set the discount rate at 4 per cent. As the basis for the discount rate, we have assumed that the risk-free interest rate in the long term amounts to 2.5 per cent, while the banks’ margin on

mortgages is 1.5 per cent. For a scenario with a higher interest rate, we have set the discount rate at 6 per cent.<sup>32</sup>

The tax rate  $\tau$  refers to the total financing cost. We are therefore suggesting that it should be calculated as a weighted average for the two sources of finance, i.e., 30 per cent for loans and 20 per cent for equity. The house purchases in our data are financed with two thirds borrowed capital and one third equity. We have therefore set the tax rate  $\tau$  at 27 per cent. When the interest deduction is limited to 20 per cent, the weighted average will instead be 20 per cent, as the tax rate for equity is not affected.

Apart from this we have made the same assumptions as in Englund (2016), i.e.,  $g$  is 2 per cent,  $m$  is 2.5 per cent and  $\gamma$  is 2 per cent.<sup>33</sup>

This sensitivity analysis focuses on two assumptions: the cost of capital before tax  $r$  and the relevant tax rate before the reform.

We calculate the price effect of the cost of capital  $r$  in the range of 0–6 per cent. The current low interest rates, and primarily the very low long-term interest rates that have been observed, suggest that the most relevant levels are in the range of 2–4 per cent. A capital cost of 2 per cent is slightly higher than the current short-term mortgage rates, but roughly on a par with the current longer-term mortgage rates, which may be more relevant as user costs also take into consideration costs in the longer term.

One factor that suggests a slightly higher cost of capital is that the current extremely low interest rates are probably not permanent. For comparison, Englund (2016) assumed a long-term mortgage rate before tax of 5.1 per cent. Another factor that indicates a higher cost of capital is that mortgages are not the only source of financing for houses. The term  $r(1 - \tau)$  is intended to refer to the cost of capital for a buyer on the margins that sets the prices. It is not easy to identify the buyer that is being referred to here. Arbitrage opportunities indicate that many buyers can set the prices in theory. However, the housing market is not frictionless and arbitrage opportunities are limited, particularly as Swedish regulations limit the opportunities for buy-to-let. If the cost of capital is also to take into consideration the fact that house purchases are partly financed with equity, with a higher cost of capital, or that some buyers are restricted about how much they can borrow or use unsecured loans at higher interest rates, the cost of capital can be set higher. However, the risk premium  $\gamma$  could also be said to fulfil this function.

On the other hand, the composition of the financing can be significant for what the relevant tax rate is before a reform. 30 per cent is the equivalent of a ‘full’ interest deduction. But for households that make larger deductions (have a larger deficit of capital) than SEK 100,000, the corresponding figure is 21 per cent of the margin. And in terms of equity, it is the alternative cost that is relevant, i.e. the tax on capital, which according to our calculations, is actually in the range of 15–20 per cent.

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<sup>32</sup> The difference from the present situation is that we have increased both the risk-free interest rate and the risk premium.

<sup>33</sup> Englund (2016) uses a higher interest rate, 5.1 per cent. We have justified our lower interest rate by saying that interest rate expectations are lower now than in 2016. Englund uses an interest deduction of 0.3. According to the National Financial Management Authority, the interest deduction was an average of 0.27 in 2017.



Diagram B2.1 therefore shows the price effect of limiting the interest deduction to 20 per cent at different capital costs before tax, as well as two different assumptions on the relevant tax rate for the cost of capital after tax before the reform, at both 30 and 25 per cent. They should probably be seen as an upper and lower limit for this assumption; the truth probably lies somewhere in the middle.

Combined with the fact that we assess the cost of capital in the range of 2–4 per cent to be the most relevant, this also suggests that limiting the interest deduction to 20 per cent would have a price effect in the order of -2.1 per cent to -0.3 per cent.

One conclusion of this calculation is that the prices are affected, but only to a limited extent. This effect can also be spread over time by limiting the interest deduction gradually, which is an approach that other countries have chosen. In the long term, the supply of houses will also be affected to some extent, but the impact is only expected to be small.

## Appendix 3: Households with existing mortgages

**Table B3.1:** Interest expense and proportion of households with a deficit at different interest deductions, with a 2 per cent interest rate  
(Per cent and SEK)

	Proportion with a deficit			Interest payment		
	0.3	0.2	0	0.3	0.2	0
<b>Total</b>	1.1	1.1	1.3	2,950	3,350	4,200
<b>Region</b>						
Greater Gothenburg	0.8	0.8	0.9	3,350	3,850	4,750
Greater Malmö	0.9	0.9	1.3	3,050	3,500	4,350
Greater Stockholm	0.6	0.7	0.8	4,050	4,600	5,700
Rest of Sweden	1.7	1.7	2.0	2,150	2,400	3,000
Other major towns/cities	0.8	0.9	1.1	2,750	3,100	3,900
<b>Age</b>						
18–30	0.8	0.8	1.0	2,250	2,550	3,200
31–50	0.8	0.9	1.1	3,350	3,850	4,750
51–65	1.1	1.1	1.3	3,100	3,550	4,350
66–	3.0	3.1	3.4	1,900	2,150	2,650
<b>Income</b>						
Low	2.8	3.0	3.4	1,500	1,700	2,100
Medium	0.4	0.4	0.5	2,650	3,000	3,750
High	0.2	0.2	0.2	4,950	5,600	6,950
<b>Family</b>						
1 adult, no children	1.9	2.0	2.3	1,900	2,150	2,700
1 adult, with children	3.1	3.3	4.0	2,400	2,750	3,400
2 adults, no children	0.5	0.5	0.6	3,150	3,600	4,450
2 adults, with children	0.4	0.5	0.5	3,800	4,350	5,400
<b>Loan-to-income ratio</b>						
0–300	1.0	1.0	1.1	1,900	2,150	2,700
300–450	0.7	0.7	0.9	3,650	4,200	5,200
450–	3.6	3.7	4.5	5,750	6,500	8,000
<b>Loan-to-value ratio</b>						
0–50	1.9	2.0	2.2	2,450	2,800	3,450
50–70	0.9	0.9	1.1	3,350	3,800	4,750
70–85	0.7	0.7	0.9	3,000	3,400	4,250
85–	1.3	1.5	1.6	3,100	3,500	4,400

Source: FI.

Note: ‘Low income’ refers to the borrowers that have an income in one of the three lowest deciles in the data; ‘high income’ refers to those with income in one of the three highest deciles; while ‘medium income’ refers to the other borrowers. Deciles are a division into ten equal parts; where the lowest are in the first decile, and the highest are in the tenth decile.

**Table B3.2:** Interest expense and proportion of households with a deficit at different interest deductions, with a 4 per cent interest rate  
(Per cent and SEK)

	Interest payment			Proportion with a deficit		
	0.3	0.2	0	0.3	0.2	0
<b>Total</b>	2.0	2.3	3.1	5,850	6,600	8,050
<b>Region</b>						
Greater Gothenburg	1.5	1.8	2.9	6,700	7,550	9,250
Greater Malmö	1.9	2.3	3.2	6,050	6,850	8,400
Greater Stockholm	1.3	1.6	2.5	8,100	9,100	11,050
Rest of Sweden	2.8	3.0	3.8	4,100	4,650	5,750
Other major towns/cities	1.7	1.9	2.8	5,400	6,150	7,550
<b>Age</b>						
18–30	1.7	2.0	3.4	4,400	5,000	6,200
31–50	1.9	2.2	3.0	6,650	7,500	9,200
51–65	1.6	1.9	2.3	6,100	6,900	8,400
66–	4.1	4.4	5.6	3,700	4,200	5,150
<b>Income</b>						
Low	4.8	5.4	7.4	2,850	3,300	4,100
Medium	0.9	1.1	1.6	5,150	5,850	7,250
High	0.4	0.5	0.6	9,900	11,100	13,450
<b>Family</b>						
1 adult, no children	3.1	3.4	4.7	3,700	4,200	5,200
1 adult, with children	6.7	7.7	10.5	4,750	5,400	6,650
2 adults, no children	0.8	0.9	1.3	6,200	7,000	8,600
2 adults, with children	1.0	1.1	1.6	7,600	8,550	10,450
<b>Loan-to-income ratio</b>						
0–300	1.3	1.4	1.7	3,700	4,200	5,200
300–450	1.6	1.9	3.0	7,350	8,250	10,100
450–	7.2	8.4	11.5	11,350	12,650	15,200
<b>Loan-to-value ratio</b>						
0–50	2.9	3.1	4.0	4,850	5,450	6,700
50–70	1.7	1.9	2.7	6,650	7,500	9,200
70–85	1.6	1.8	2.7	5,950	6,700	8,250
85–	3.2	3.5	4.9	5,850	6,650	8,150

Source: FI.

Note: ‘Low income’ refers to the borrowers that have an income in one of the three lowest deciles in the data; ‘high income’ refers to those with income in one of the three highest deciles; while ‘medium income’ refers to the other borrowers. Deciles are a division into ten equal parts; where the lowest are in the first decile, and the highest are in the tenth decile.

**Table B3.3:** Interest cost and proportion of households with a deficit at different thresholds, with a 4 per cent interest rate and the current interest deduction  
(Per cent and SEK)

	Interest payment			Proportion with a deficit		
	100,000	70,000	24,000	100,000	70,000	24,000
<b>Total</b>	2.0	2.0	2.1	5,850	5,950	6,200
<b>Region</b>						
Greater Gothenburg	1.5	1.5	1.8	6,700	6,850	7,150
Greater Malmö	1.9	1.9	2.0	6,050	6,200	6,450
Greater Stockholm	1.3	1.3	1.4	8,100	8,250	8,550
Rest of Sweden	2.8	2.8	2.9	4,100	4,150	4,350
Other major towns/cities	1.7	1.5	1.8	5,400	5,500	5,800
<b>Age</b>						
18–30	1.7	1.7	1.9	4,400	4,500	4,750
31–50	1.9	1.9	2.0	6,650	6,800	7,100
51–65	1.6	1.6	1.6	6,100	6,200	6,450
66–	4.1	4.1	4.2	3,700	3,750	3,900
<b>Income</b>						
Low	4.8	4.8	5.1	2,850	2,900	3,050
Medium	0.9	0.9	1.0	5,150	5,250	5,550
High	0.4	0.4	0.4	9,900	10,100	10,400
<b>Family</b>						
1 adult, no children	3.1	3.1	3.3	3,700	3,750	3,950
1 adult, with children	6.7	6.8	7.2	4,750	4,850	5,100
2 adults, no children	0.8	0.8	0.8	6,200	6,350	6,600
2 adults, with children	1.0	1.0	1.0	7,600	7,750	8,050
<b>Loan-to-income ratio</b>						
0–300	1.3	1.3	1.4	3,700	3,750	3,950
300–450	1.6	1.7	1.8	7,350	7,500	7,800
450–	7.2	7.3	7.7	11,350	11,550	11,850
<b>Loan-to-value ratio</b>						
0–50	2.9	2.9	2.9	4,850	4,900	5,100
50–70	1.7	1.7	1.8	6,650	6,800	7,100
70–85	1.6	1.6	1.7	5,950	6,050	6,350
85–	3.2	3.2	3.4	5,850	6,000	6,250

Source: FI.

Note: ‘Low income’ refers to the borrowers that have an income in one of the three lowest deciles in the data; ‘high income’ refers to those with income in one of the three highest deciles; while ‘medium income’ refers to the other borrowers. Deciles are a division into ten equal parts; where the lowest are in the first decile, and the highest are in the tenth decile.

**Table B3.4:** Interest cost and proportion of households with a deficit at different thresholds, with a 4 per cent interest rate and no deduction above the threshold  
(Per cent and SEK)

	Interest payment			Proportion with a deficit		
	100,000	70,000	24,000	100,000	70,000	24,000
<b>Total</b>	2.1	2.2	2.7	6,250	6,600	7,500
<b>Region</b>						
Greater Gothenburg	1.8	1.8	2.4	7,200	7,650	8,650
Greater Malmö	1.9	2.1	2.8	6,500	6,900	7,800
Greater Stockholm	1.4	1.6	2.1	8,950	9,450	10,500
Rest of Sweden	2.8	2.9	3.3	4,250	4,500	5,200
Other major towns/cities	1.8	1.9	2.4	5,750	6,050	6,950
<b>Age</b>						
18–30	1.8	1.9	2.8	4,550	4,800	5,650
31–50	2.0	2.1	2.6	7,200	7,650	8,600
51–65	1.8	1.8	2.1	6,650	7,000	7,850
66–	4.1	4.2	4.5	3,900	4,050	4,650
<b>Income</b>						
Low	4.9	4.9	6.2	2,900	2,950	3,550
Medium	1.1	1.2	1.5	5,350	5,700	6,650
High	0.5	0.6	0.6	11,150	11,750	12,850
<b>Family</b>						
1 adult, no children	3.1	3.2	4.0	3,850	4,000	4,650
1 adult, with children	6.9	7.1	8.7	5,050	5,250	6,050
2 adults, no children	0.9	1.0	1.1	6,700	7,100	8,000
2 adults, with children	1.1	1.2	1.5	8,300	8,800	9,850
<b>Loan-to-income ratio</b>						
0–300	1.3	1.3	1.5	3,800	4,000	4,650
300–450	1.6	1.7	2.4	7,950	8,450	9,500
450–	8.3	9.0	10.8	12,850	13,500	14,650
<b>Loan-to-value ratio</b>						
0–50	2.9	3.0	3.3	5,200	5,400	6,100
50–70	1.7	1.8	2.2	7,250	7,650	8,600
70–85	1.7	1.8	2.4	6,350	6,700	7,650
85–	3.4	3.8	4.6	6,250	6,600	7,550

Source: FI.

Note: ‘Low income’ refers to the borrowers that have an income in one of the three lowest deciles in the data; ‘high income’ refers to those with income in one of the three highest deciles; while ‘medium income’ refers to the other borrowers. Deciles are a division into ten equal parts; where the lowest are in the first decile, and the highest are in the tenth decile.



## Appendix 4: Households that are going to take out new mortgages

**Table B4.1:** Proportion of households in 2018 with a KALP deficit using different estimates of price changes (after lowering the deduction), with a stressed mortgage rate of 7 per cent  
(Per cent)

<i>Deduction ( per cent):</i>	<b>30</b>	<b>20</b>		
<i>Prices ( per cent):</i>	<b>0</b>	<b>0</b>	<b>-1</b>	<b>-5</b>
<b>Total</b>	7.2	11.0	9.3	7.6
<b>Region</b>				
Greater Gothenburg	7.0	11.5	9.4	7.2
Greater Malmö	7.7	11.4	9.6	8.0
Greater Stockholm	8.1	13.8	11.1	8.6
Rest of Sweden	7.1	9.5	8.5	7.5
Other major towns/cities	6.2	9.7	8.3	6.6
<b>Age</b>				
18–30	9.7	15.4	13.2	10.7
31–50	7.4	11.5	9.7	7.9
51–65	4.6	6.9	5.6	4.8
66–	7.9	10.1	8.7	7.4
<b>Income</b>				
Low	14.3	20.8	18.0	15.1
Medium	5.5	8.9	7.3	5.7
High	1.9	3.3	2.6	2.1
<b>Family</b>				
1 adult, no children	10.3	15.9	13.6	11.0
1 adult, with children	19.8	27.6	23.7	20.8
2 adults, no children	2.6	4.2	3.3	2.6
2 adults, with children	5.6	8.7	7.4	5.9
<b>Loan-to-income ratio</b>				
0–300	2.6	3.4	3.0	2.6
300–450	8.3	13.2	11.0	9.0
450–	28.4	43.6	36.8	29.5
<b>Loan-to-value ratio</b>				
0–50	5.9	7.7	6.4	5.3
50–70	6.7	10.5	8.6	7.0
70–85	7.9	12.7	10.9	8.9
85–	11.5	17.1	14.4	12.7

Source: FI.

Note: ‘Low income’ refers to the borrowers that have an income in one of the three lowest deciles in the data; ‘high income’ refers to those with income in one of the three highest deciles; while ‘medium income’ refers to the other borrowers. Deciles are a division into ten equal parts; where the lowest are in the first decile, and the highest are in the tenth decile.