

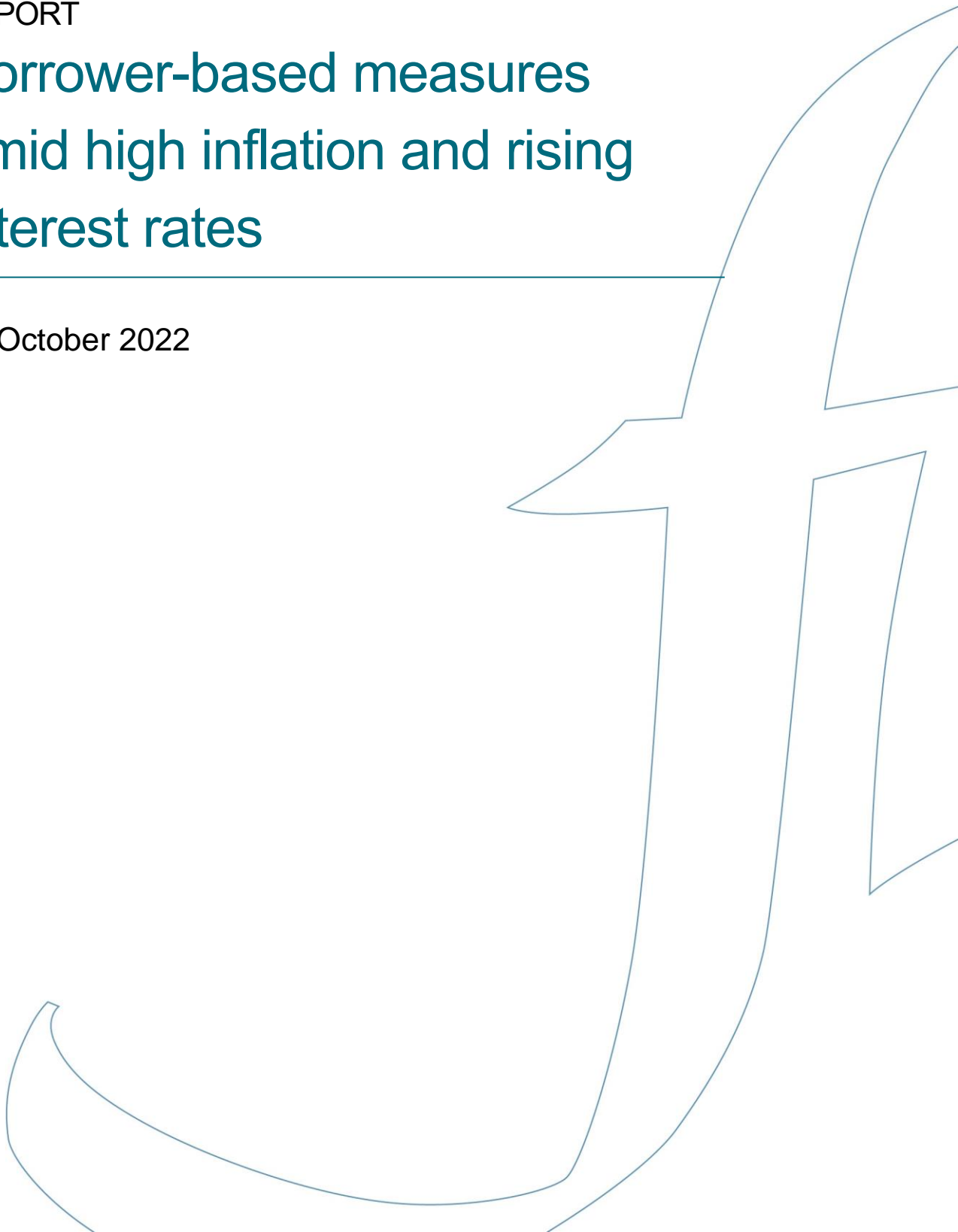


REPORT

# Borrower-based measures amid high inflation and rising interest rates

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14 October 2022



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Finansinspektionen  
Box 7821, 103 97 Stockholm  
Street address Brunnsgatan 3  
Telephone +46 8 408 980 00  
finansinspektionen@fi.se  
www.fi.se

## Foreword

At the beginning of September, the Government assigned Finansinspektionen (FI) the task of evaluating the impact of implemented borrower-based measures: specifically, the mortgage cap and two amortisation requirements. The assignment clarifies that the evaluation should focus on the impact given the current economic conditions of high inflation and rising interest rates and in particular the impact for households with lower income and small margins in their finances as well as different groups' possibilities for entering the housing market. The assignment also includes analysing how changes in measures across a business cycle could contribute to the management of risks for households with large loans and the maintenance of a good supply of credit.

Our report is broken down into five sections. We start with a description of the events leading up to and the general impact of the measures. In the second section, we describe the current economic conditions with a focus on changes in consumer prices and interest rates. Using this as our basis, we then analyse in the third section how the economic development is affecting the impact of the borrower-based measures for households with lower income and small margins in their finances as well as how the possibilities for entering the housing market have changed. In the fourth section, we analyse how changes to the measures over the course of a business cycle could impact the risks associated with household debt. In the final section, we summarise FI's view on the questions in focus, both together and individually. FI presents its final conclusions on this assignment through this report.

Stockholm 14 October 2022

Erik Thedéen  
Director General

## Summary

Since 2010, Finansinspektionen (FI) has introduced a mortgage cap (limiting the loan-to-value ratio for new mortgages) and two amortisation requirements on mortgages. As a result of these measures, mortgage holders have smaller loans than what they would have had if the measures had not been introduced, both in relation to the value of the home and the household's income. The increase that Swedish mortgagors are experiencing in their interest expenses is thus lower than what they otherwise would experience. For many households, this provides better opportunities for handling the challenges presented by rising interest rates, high inflation and high electricity prices.

FI's mortgage measures were introduced as preventive measures to slow the *structural* risks associated with the households' high debt levels. These risks have been building up over a long period of time due to low interest rates, a tax system that promotes debt, and sharp increases in housing prices and debt. If the structural risks were to decrease to an equal extent more permanently, this could create grounds on which to ease the measures as long as a sound amortisation culture is maintained. Such a decrease would probably require a long period of lower risk-taking, lower incentives to take large loans, and measures to improve how the housing market functions. We are not there today, and FI therefore does not see any structural grounds for significantly changing the measures' overall focus.

In exceptional financial circumstances, there can be grounds on which to *temporarily* change structural measures. Given the uncertainty stemming from the pandemic, FI opened up the possibility of general exemptions from the amortisation requirements for a limited period of time. Borrowers worried about the impact the pandemic could have on their finances were thus given the opportunity to build larger buffers in the form of easily accessible savings. This was supported by simultaneous measures from the Government, Parliament and the Riksbank to mitigate the financial impact of the pandemic.

The current state of the economy is significantly different than in the spring of 2020. Economic forecasts may be negative and the outlooks uncertain, but they are nowhere near as negative as at the beginning of the pandemic. Also, easing the amortisation requirements now would go against current monetary policy. Therefore, FI does not view a temporary general exemption from the amortisation requirements to be a well-balanced measure at this point in time. This type of temporary exemption would also decrease the measures' intended risk mitigation; we saw, for example, during the pandemic that some borrowers took larger loans as a result of the general amortisation exemption.

FI regularly analyses the balance of implemented measures to ensure they are as effective and well-balanced as possible. If the economic development were to

decline substantially and it were possible to avoid going against monetary policy aims, FI's overall assessment regarding the possibility of granting temporary general exemptions could change.

Even if there are no grounds for broad exemption possibilities, however, households' cash flows will deteriorate in the near future. The current challenging economic conditions, with broad and high inflation, higher interest rates and exceptionally higher electricity prices, mean that the percentage of households experiencing financial difficulties will increase. This applies in particular to households with lower income and households that were starting with small margins in their finances.

But there are relatively few mortgage holders in the most exposed groups. Mortgage holders tend to have significantly higher income than the average household at the same time as FI's analyses show that mortgage holders with new loans in general have substantial financial margins when they are signing for their mortgages. The latter is because the combination of amortisation requirements, the mortgage cap and the banks' credit assessments has meant that mortgage holders should have good margins to different types of shocks that affect households' cash flows or housing prices. The large margins that mortgage holders have in general when they sign for their loans also mean that a pause in or permanent reduction to the amortisation requirements would not be an efficient measure to help households which are most vulnerable. Most households with small margins are not currently subject to amortisation requirements. Even when focusing solely on recent mortgage borrowers such measures would not help the most vulnerable mortgagors since the ones that are amortising the most today are not the borrowers with small margins.

Individual mortgage holders can still be hit hard by the economic developments going forward. The current regulations allow banks to grant mortgage holders who through a significant change in their circumstances experience financial difficulties temporary exemption from the amortisation requirements so they can better handle the situation.

It is up to the lender to grant such an exemption based on individual assessments of the mortgage holder's finances. The amortisation regulations were worded in such a manner as to purposely allow for an open interpretation of when a significant change in financial circumstances means that an exemption can be granted, thus enabling flexible application of the rules by the banks. This means that the banks can grant exemptions when the changed circumstances are the result of, for example, high essential energy costs.

This type of individual exemption from the amortisation requirement can be helpful for mortgage holders who have small or no margins in their finances.

However, targeted policy measures are required to effectively support households that have experienced or are experiencing problems with their finances as a result of high electricity prices and other essential consumption.

# Mortgage cap and amortisation requirements subdued risks associated with household debt

Given rapidly rising housing prices, rapid growth of mortgages and expansive credit conditions, FI has identified various risks linked to these developments and introduced a mortgage cap (limiting the loan-to-value ratio for new mortgages) and two amortisation requirements to mitigate these risks.<sup>1</sup>

## The mortgage cap

FI introduced general guidelines in 2010 with the aim of limiting how large a mortgage a household can take in relation to the value of the home.<sup>2</sup> The mortgage cap means that the mortgage should be a maximum of 85 per cent of the home's value. The remaining part needs to be financed in other ways, for example with own savings (including funds from the sale of a previous home) or a home loan without collateral (unsecured loans).<sup>3</sup> The stated purpose of the measure was to strengthen consumer protection and prevent unsound lending practices. High loan-to-value (LTV) ratios and low amortisation mean that individual borrowers are exposed to higher price fall risks. If housing prices fall, there is a greater probability that these households will be left with residual debt if they want or are forced to sell their home. Prior to the introduction of the mortgage cap, it was common for mortgage companies (hereafter banks or lenders) to issue loans with an LTV ratio of up to 100 per cent. Many of these loans had low amortisation rates or were even amortisation free. This type of mortgage had also become a competitive tool among lenders.

## Amortisation requirements

High indebtedness among households is associated with risks. The legislation therefore requires the banks to apply repayment conditions that are compatible with a sound amortisation culture and prevent excessively high indebtedness among households.<sup>4</sup> To ensure this, FI decided in 2016 to introduce regulations on

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<sup>1</sup> For more detailed discussions, see Finansinspektionen (2021), *Overall Assessment of Macprudential Measures* and Finansinspektionen (2019), *FI and Financial Stability*.

<sup>2</sup> See *Finansinspektionen's general guidelines (FFFS 2016:33) regarding limitations to the size of loans collateralised by residential properties*. The general guidelines were originally introduced in 2010 through Finansinspektionen's general guidelines (FFFS 2010:2) regarding limitations to the size of loans collateralised by homes but were reissued in 2016 in connection with their scope being extended to also include lenders with authorisation according to the Mortgage Business Act (2016:1024).

<sup>3</sup> Below, we use the simplified term unsecured loan for home loans without collateral, even though unsecured loans can also be used for other purposes.

<sup>4</sup> There is also a requirement on the banks to not contribute to financial imbalances on the credit market.

amortisation requirements, which were then tightened in 2018 with the government's approval. The first amortisation requirement entails that households that take out a mortgage with an LTV ratio above 50 per cent must amortise 1 per cent of the loan per year. Households with an LTV ratio above 70 per cent must amortise 2 per cent per year. The stricter amortisation requirement entails that households with loan-to-income (LTI) ratios (total mortgage divided by annual income before tax) above 450 per cent need to amortise an additional 1 per cent of the loan per year.<sup>5</sup>

The main purpose of amortisation requirements is to ensure that the banks apply repayment terms that both are compatible with a sound amortisation culture and prevent excessive household indebtedness. While the risks of significant credit losses at mortgage lenders appeared and appear to be low, FI makes the assessment that large loans mean that mortgagors may be forced or choose to reduce their consumption significantly. If many mortgagors do this, macroeconomic risks arise because there is a risk that economic downturns will be reinforced by highly indebted households reducing their consumption. An amortisation requirement affects how much the household wants to and may borrow when the loan is issued, and the loan decreases over time because it is repaid. The sensitivity of households to higher interest rates, lower income, falling housing prices or higher subsistence costs is also determined by the size of their liquid buffer, where large loans are often associated with a smaller buffer and greater sensitivity.<sup>6</sup>

## General effects

FI has evaluated on an ongoing basis the effects of the mortgage cap and the amortisation requirements. Because of these measures, new mortgagors have borrowed less and bought more inexpensive homes than they would have done without the measures.<sup>7</sup> This has helped slow both loan growth and the rise in housing prices. The amortisation requirements have also meant that households are amortising more than before, which means that the loan burden for individual households is decreasing more quickly over time.

Compared to how the mortgage market previously functioned, the measures themselves have not led to major changes in the income required for a loan. This is because banks previously used stricter credit screening criteria for loans with higher LTV ratios and to a large extent required households be able to repay the loan while simultaneously paying subsistence costs and stressed interest expenses.

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<sup>5</sup> See *Finansinspektionen's regulations (FFFS 2016:16) regarding amortisation of loans collateralised by residential property*.

<sup>6</sup> See Almenberg et al. (FI Analysis 33, 2021).

<sup>7</sup> See *Overall Assessment of Macprudential Measures*, Finansinspektionen (2021) and references therein for a more detailed discussion of the impact of the measures so far. Evaluations of the mortgage cap have focused on households' total loans, while evaluations of the amortisation requirements have focused on households' mortgages.



However, it is possible that without these measures the credit screening would have been looser instead of unchanged. With ever higher housing prices and thus the need to finance a greater part of the housing purchase with loans, the income (or wealth) required to pass the banks' credit screening and be approved for a mortgage is higher than before.

The major change following the introduction of the measures is that large mortgages relative to the value of the home or the household's income have meant higher loan service payments for households, which has dampened their demand for loans. The mortgage cap has meant that mortgages with LTV ratios of, for example, 90 or 95 per cent and low rates of amortisation have disappeared. Instead, households that requested this type of loan have had to supplement their mortgage with unsecured loans at higher interest rates and rates of amortisation. Many have instead chosen to borrow less, buy a more inexpensive home than they otherwise would have done, or finance the last 15 per cent of the home's value in some other way, for example through loans or support from relatives.

Similarly, the first amortisation requirement meant that households' ongoing payments for a given loan size are larger because they are required to amortise more. This also applies to the stricter amortisation requirement, which also – unlike the first amortisation requirement – has entailed a stricter credit screening. This is because banks previously did not take the actual LTI ratio directly into account in their credit assessment.<sup>8</sup> This differs from the first amortisation requirement since the banks already before the amortisation requirements required households with higher LTV ratios to be able to handle larger amortisation payments, even if they ultimately did not have to amortise to the same extent.

## Effects over time

The mortgage cap mainly works at the point in time when a loan is issued. However, given that housing prices vary over a business cycle, the amount that cannot be financed with a mortgage for a given home also varies. When housing prices go down, less financing is required. For households that are outside the owner-occupied housing market and want to buy a home, the mortgage cap is undeniably less intrusive when housing prices are lower, which increases the opportunities for this group to enter the housing market. For households that already own their home and want to buy a more expensive home, the probability that the borrower will be limited by the mortgage cap increases, even if the loan itself is due to lower housing prices.

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<sup>8</sup> However, it has been common for a long time for mortgage providers to be more restrictive when granting loans in order for the loan-to-income ratio not to exceed various thresholds.

A similar mechanism exists at the point in time that the loan is granted for the first amortisation requirement, which is based on LTV ratios. For example, both loans and amortisation payments are smaller when housing prices are lower. When housing prices are lower, smaller loans can lead to lower LTV ratios, which means that a lower nominal income is required to pass the credit screening for a given home. The stricter amortisation requirement also becomes less strict. Lower housing prices require lower loans, which means that amortisation at 1 per cent corresponds to a smaller amount. If housing prices fall relative to income, the probability of needing to borrow more than 450 per cent of gross income also decreases. Higher housing prices have the opposite effect, and there is thus an automatic stabilising effect from the stricter amortisation requirement: when housing prices relative to income are high, the effects on new lending are more restrictive; when the ratios are lower, the requirement is less restrictive.

These mechanisms focus on the effect of the measures given new loans. For those who have already taken out a loan and amortise according to the requirements of the regulations, the amortisation remains the same as before unless there are special reasons for the lender to be able to (and choose to) grant temporary exemption from the requirement. Apart from such situations, the amortisation payment's share of the income varies with the nominal income. How much this affects the individual household depends on how other expenses vary, for example interest expenses depending on whether the household has chosen variable or fixed contracts but also other living expenses.

## Regulations are flexible

With regard to both the mortgage cap and the amortisation regulations, flexibility has been built into the regulation to make it easier for lenders and households at the time the loan is granted and when the financial conditions change.

The general guidelines regarding the mortgage cap state that a lender should limit the LTV ratio for a mortgage so that it does not exceed 85 per cent of the home's market value at the time the loan is granted. These guidelines are not binding but constitute a recommendation for how the provision on soundness in the Banking and Financing Business Act (2004:297) should be applied.<sup>9</sup> This means that there is scope for a lender, instead of limiting the LTV ratio, to take other measures that lead to the purpose of the provision on soundness being fulfilled. The decision memorandum underlying the general guidelines gives as an example of such alternate measures that the lender require insurance for price drops when lending more than 85 per cent of the LTV ratio. The decision memorandum also mentions

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<sup>9</sup> See Chapter 6, section 4 of the Banking and Financing Business Act. Chapter 4, section 1 of the Mortgage Business Act applies instead for mortgage lenders other than credit institutions.

that unsecured loans with a higher rate of amortisation can be used as a supplement to a mortgage with an 85 per cent LTV ratio while achieving the objective.

As regards the amortisation requirements, the regulations initially contain several provisions that give the lender the possibility to grant exemptions from amortisation given certain specific circumstances.<sup>10</sup> For example, when approving a new loan that is collateralised by a newly produced home, a lender can grant exemption from the requirements for up to five years. Another example is that a lender may grant amortisation exemption under the regulations to a borrower for a new loan that is collateralised by an agricultural property.

In addition to these exemption provisions, the lender may also grant temporary exemption from the amortisation requirements if special reasons arise during the term of the loan.<sup>11</sup> The decision memorandum underlying the amortisation regulations state that special reasons may arise if, for example, the borrower's financial circumstances deteriorate significantly due to unemployment or illness.<sup>12</sup>

An exemption due to special reasons presupposes that the circumstances occurred after the loan was granted and that the lender makes an individual assessment based on the borrower's circumstances. The lender must also make the assessment that granting amortisation relief is compatible with sound lending practices.

The flexibility provided by this exemption possibility exists so that lenders and borrowers can handle any financial difficulties that arise, for example loss of income due to unemployment or illness or unpredictable increases in key expenditure items. The bank thus is able to determine on a case-by-case basis what constitutes a special reason due to a significant change in financial circumstances. The possibility of granting exemption is not limited to the examples given in the decision memorandum.

Normally, a special reason applies if the circumstances are attributable to an individual borrower. However, there may be grounds to view this approach differently under exceptional circumstances. For example, FI clarified at the outbreak of the pandemic that the sharp downturn in the Swedish economy was sufficient for lenders to apply the exemption clause without conducting an individual assessment.<sup>13</sup> These general guidelines target exceptional situations and have a limited scope of application. A more normal downturn in the economy does not constitute an event of the kind that the general guidelines are targeting.

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<sup>10</sup> See sections 12–16 of the amortisation regulations.

<sup>11</sup> See section 11 of the amortisation regulations.

<sup>12</sup> See p. 49ff of the decision memorandum, FI Ref. 14-16628.

<sup>13</sup> See *Finansinspektionen's general guidelines (FFFS 2020:3) on exemption from amortisation requirements on special grounds*.

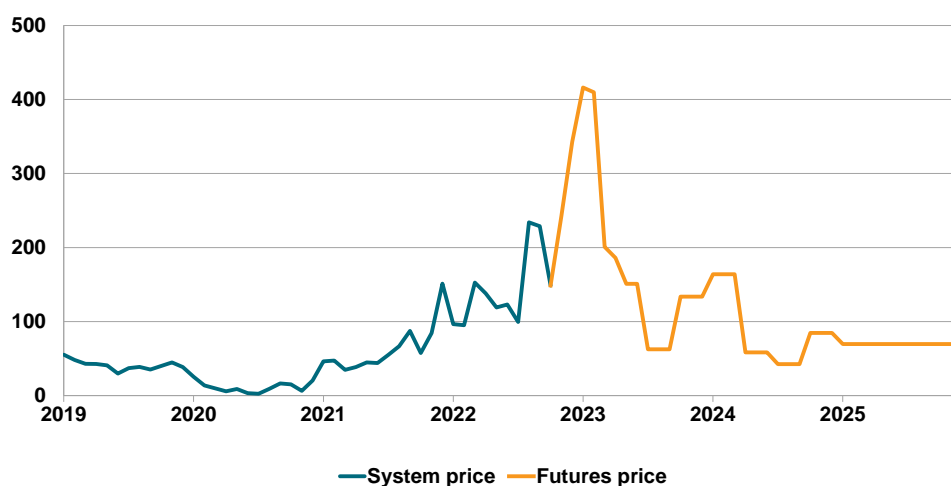
# High inflation and rising interest rates challenge household finances

The current economic situation with very high inflation, rising interest rates and falling growth poses a considerable challenge for many Swedish households. The general inflationary situation affects all households. For households with lower income and small financial margins, the cost increases do not have to be exceptional for the household to be greatly affected, but households with large margins are also affected initially. Large cost increases affect in particular households that consume lot of energy in their home and households with large mortgages at variable rates. At the same time, households that have high income and large wealth can cope with large cost increases without noticing a major impact on their finances.

Energy prices in both Sweden and Europe have risen in 2022 to levels that are very high historically. The upswing in prices can mainly be explained as a supply shock due to the shrinking supply of energy. One of reasons for why supply has shrunk is that deliveries of energy from Russia to Europe have decreased sharply. The combination of an increase in demand for energy in the coming winter months and continued pressure on the supply means that there are reasons to fear that energy prices may increase further (see Diagram 1).

## 1. High energy prices

Price in öre/kWh



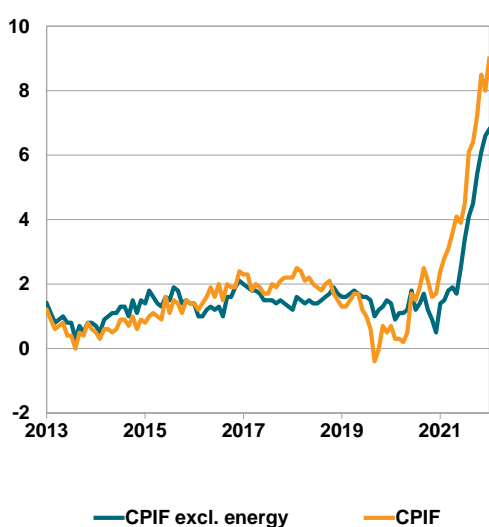
Source: Refinitiv Eikon and Nord Pool.

Note: Historical prices refer to prices on the spot market. The futures prices are from 3 October 2022 and can be seen as an expectation of the price situation going forward for the so-called system price.

Inflation has gradually increased during 2022 (see Diagram 2). Due to rising inflation, monetary policy has been tightened and expectations of higher policy rates have affected banks' financing costs and mortgage interest rates have risen (see Diagram 3). First, interest rates with longer fixed periods rose significantly when the banks' cost of financing for longer maturities increased. Floating interest rates have also risen and are expected to continue to rise in the coming six months as monetary policy is tightened.

## 2. Rising inflation

Per cent

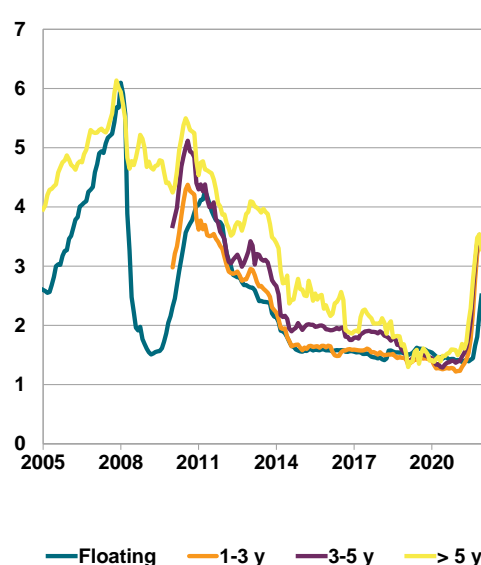


Source: Statistics Sweden.

Note: The latest observation is the outcome for August 2022.

## 3. Higher mortgage interest rates

Per cent



Source: Statistics Sweden.

Note: The data is from Financial Market Statistics and extends to August 2022.

Swedish households' confidence in the future has been affected by the developments. Expectations for their own economy have fallen to record-low levels in recent months, significantly lower than during both the financial crisis in 2008 and the outbreak of the pandemic in 2020.<sup>14</sup> Up through August, housing prices had fallen by almost 5 per cent since the start of the year and by nearly 9 per cent since February (Diagram 4).<sup>15</sup> This means that housing prices are at roughly the same level as Q1 2021. Taking into account the changed conditions for households, it is not improbable that housing prices will continue to fall.<sup>16</sup>

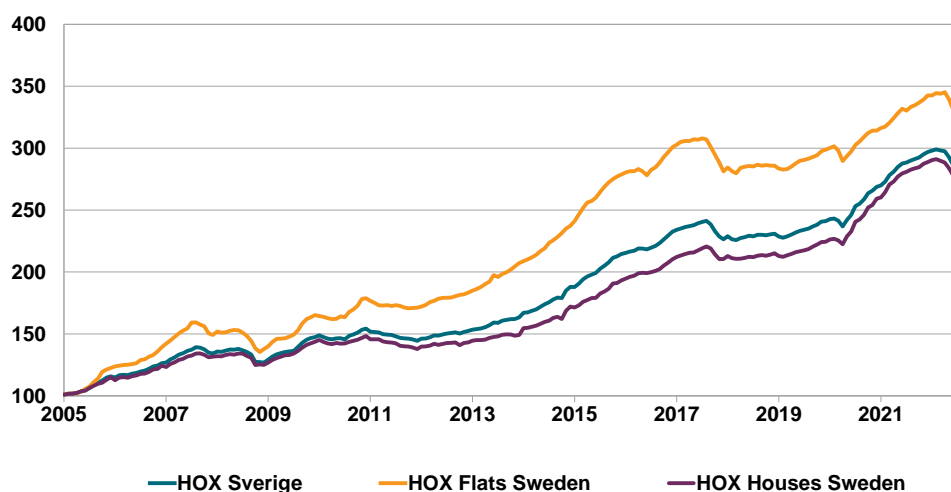
<sup>14</sup> According to NIER's Economic Tendency Indicator (September 2022).

<sup>15</sup> According to Valueguard's index for the total housing market.

<sup>16</sup> The Riksbank forecasts that prices will continue to fall in the near future. Major banks also expect falling housing prices this year and next year. See also *The Swedish Mortgage Market*, Finansinspektionen (2022) for calculations given changed conditions.

#### 4. Housing prices

Index = 100, 2005



Source: Valueguard.

Note: The series are seasonally adjusted. The latest outcome is August 2022.

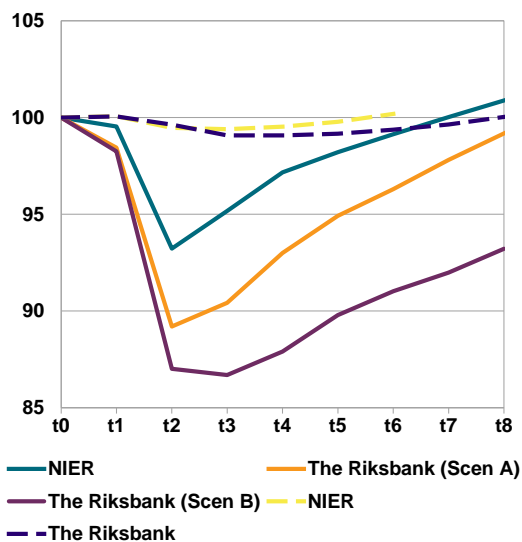
In recent years, both the global economy and the Swedish economy have suffered major shocks. The outbreak of the pandemic generated exceptional uncertainty and a significant economic downturn in both Sweden and the rest of the world. Large parts of the world economy recovered in 2021, but in 2022, inflation and the impact of the war in Ukraine, among other things, have adversely impacted the outlook for the Swedish economy. However, the forecasts are significantly less pessimistic than they were at the start of the pandemic (see Diagram 5). During the spring of 2020, Swedish GDP was forecast to shrink by between 3 and 10 per cent.<sup>17</sup> The current state of the economy is significantly different. Current forecasts predict that the recession in 2022–2023 will be relatively mild, and the outlook for the Swedish economy is not as gloomy right now.<sup>18</sup> However, the high inflation the market is experiencing right now is leading to a sharp drop in real wages and reduced disposable income. At the same time, though, households' real disposable income is expected to be impacted less negatively than in early forecasts during the pandemic (see Diagram 6), in part due to a continued strong labour market.

<sup>17</sup> Forecasting conditions changed rapidly during the beginning of the pandemic. In 2020, many forecasters chose to publish scenarios instead of forecasts, while many institutes chose to only publish forecasts for a few main variables, such as GDP and unemployment (see Special Study 2021:6, *Evaluation of Macroeconomic Forecasts*, National Institute of Economic Research, 2021).

<sup>18</sup> The current forecast is for the Swedish economy to enter a recession next year, with expected real GDP growth in 2023 of 0.4 per cent (Government, August 18), -0.7 per cent (Riksbank, September 20) and -0.1 per cent (National Institute of Economic Research, September 28).

### 5. GDP forecasts 2020 compared to 2022

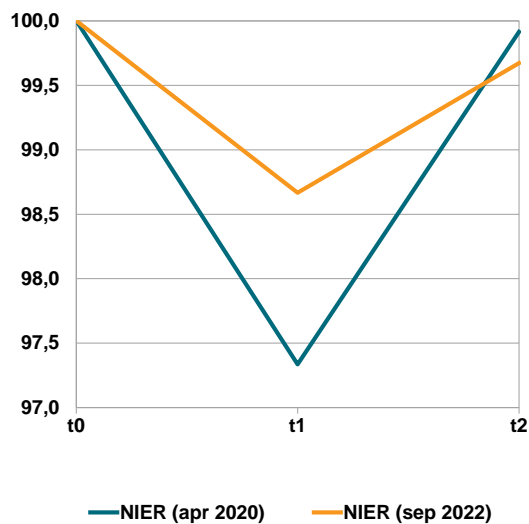
Index = 100, quarter before forecast, seasonally adjusted quarterly values



Source: National Institute of Economic Research and the Riksbank.  
 Note: Solid lines refer to scenarios for Swedish GDP published by NIER and the Riksbank on 1 and 28 April 2020, respectively. Dashed lines refer to the Riksbank's and NIER's GDP forecasts published on 20 and 28 September 2022, respectively. t0 refers to 2019 Q 4 for the solid lines and 2022 Q2 for the dashed lines.

### 6. Real disposable income per capita

Index = 100, year before forecast



Source: National Institute of Economic Research.  
 Note: Real disposable income per inhabitant. Deflated with the consumption deflator. t0 refers to the year 2019 for the April 2020 scenario and 2021 for the September 2022 forecast.

## How are borrowers with lower income affected?

### Most low-income earners do not own their home and have no mortgage

The economic development of rising costs relative to income affects most households negatively. Households most affected are largely those with low income and those that already had small financial margins. Households with low income and small margins tend to live in rental housing.<sup>19</sup> These households have no mortgage and are therefore not directly affected by rising interest rates and possible changes in FI's measures but may be more sensitive to economic developments and high inflation. Households that own their home often have significantly higher income and larger margins. At the same time, many of them have large loans and high electricity consumption, for example to heat their home. They are therefore more directly exposed to rising interest rates and high energy prices than those living in rented accommodation. Below we show how mortgagors are affected based on new mortgagors for whom we have detailed data. This analysis provides a good overview of the challenges that mortgagors, especially new ones, face in today's economic climate. However, the analysis does not provide an overview of how Swedish households are affected since only about half of Swedish households have mortgages.

Every year, FI collects detailed data on a sample of new mortgagors.<sup>20</sup> To illustrate how the state of the economy affects mortgagors, we use the most recent data that was collected in 2021.<sup>21</sup> The sample is not representative of all mortgagors since new mortgagors usually have the largest loans, highest interest expenses and largest amortisation payments. For example, the average new mortgage was SEK 2.7 million in 2021, while the average mortgage in the banks' mortgage portfolios was approximately SEK 1.5 million. Among new mortgagors, the average amortisation was SEK 3,500 per month, and in the portfolio the average is SEK 2,000. Overall, the calculations below can therefore be assumed to be in the upper range for how the economic development is affecting an average household with a mortgage.

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<sup>19</sup> See, for example, <https://www.scb.se/hitta-statistik/artiklar/2017/Laginkomsttagare-bor-ofta-i-hyresratt/>.

<sup>20</sup> New mortgagors refer to all households that have taken out a new mortgage. This includes both first-time buyers and households buying a new home. It also includes those who have taken home equity loans or changed banks.

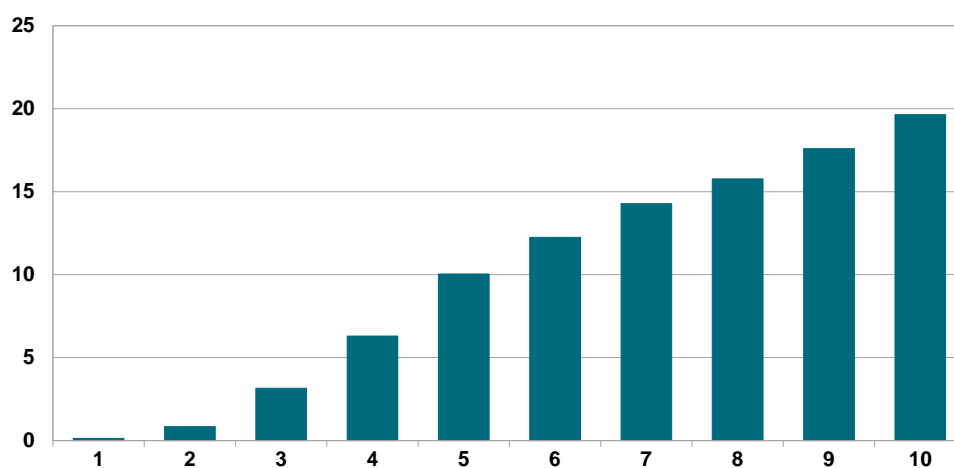
<sup>21</sup> See *The Swedish Mortgage Market*, Finansinspektionen 2022. We use new mortgagors since we do not yet have access to micro data at the portfolio level.



Households with lower income are generally underrepresented among new mortgagors (see Diagram 7).<sup>22</sup> In the sample from the mortgage survey in 2021, approximately 20 per cent of households had an income per consumption unit that was lower than the median for Sweden as a whole.<sup>23</sup> Households with low income that are at risk of being hit particularly hard by a higher cost of living represent only a small percentage of mortgagors. Conversely, just over half of new mortgagors are in income decile eight or higher.<sup>24</sup>

## 7. Distribution of new mortgagors across income deciles

Per cent



Source: FI and Statistics Sweden.

Note: The X axis shows income deciles. The deciles have been calculated using decile limits for disposable income per consumption unit from Statistics Sweden. See Footnote 23. New mortgagors' income refers to income after tax per unit of consumption.

## FI's measures reduce the effect of higher interest rates

FI's borrower-based measures have meant that mortgagors have smaller loans than they would have had without the measures. This means that a change in the interest rates has less of an impact on households' cash flow.

<sup>22</sup> The income after tax that the banks report is generally lower than the disposable income according to Statistics Sweden's definition, which means that we overestimate the proportion with lower income.

<sup>23</sup> The metric consumption unit is used to be able to compare disposable income between different types of households. A household with one adult has a consumption unit of 1. A household with two adults living together has 1.51 because part of the consumption is shared. The weights are based on budget calculations carried out by Statistics Sweden.

<sup>24</sup> Since FI began collecting data on new mortgagors, the proportion with lower income has gradually decreased and with the highest income increased. This development could be observed even before FI introduced the amortisation requirements. See Diagram 17 in the appendix *New mortgagors' income over time* for a comparison over time.

It is difficult to measure precisely the effects of the measures on household borrowing behaviour over time, not least because a number of other variables affect borrowing behaviour, for example demographics, the state of the economy, interest rate and salary expectations and supply on the housing market. In several analyses, FI has examined how much effect the introduction of the mortgage cap and the amortisation requirements has had on household borrowing behaviour.<sup>25</sup> The evaluations examine how behaviour has changed from one year to another after a measure has been introduced. One conclusion is that new mortgages are smaller than if the measures had not been introduced. Households amortise more due to the requirements, which means that the interest payments become smaller over time, but also that the total debt payments (including amortisation) are on average larger initially.

The new economic situation means that expenses have increased for interest-sensitive households. Here we illustrate what interest expenses look like today compared to a counterfactual estimate of what they would have looked like if FI had not introduced the measures.<sup>26</sup>

Because loans are smaller due to the mortgage cap and amortisation requirements, the interest-to-income ratio (interest expense as a percentage of disposable income) is significantly lower than it would have been in the counterfactual example. For borrowers who took out a new mortgage in the autumn of 2021, the interest rate was roughly 0.8 percentage points lower at the mortgage interest rate that applied at the time (Diagram 8).<sup>27</sup> For borrowers who took out a loan in 2016, the difference is larger, on average 1.3 percentage points. This is because households have also had time to amortise over time. These differences are greater today due to rising interest rates and will become even greater if mortgage rates continue to rise during the winter in line with market expectations.<sup>28</sup> The difference then amounts to 2.7 and 3.7 percentage points, respectively.

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<sup>25</sup> See FI Analysis 10; Andersson et al. (FI Analysis 12, 2018), and Andersson and Aranki (FI Analysis 17, 2019).

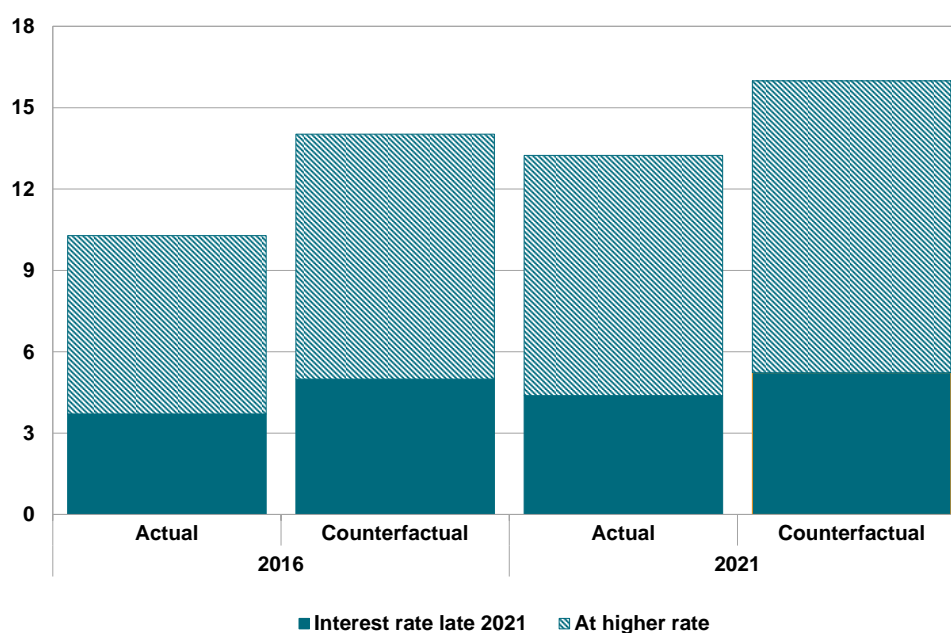
<sup>26</sup> See the appendix *Calculations of interest-to-income and debt service ratios* for a detailed description of assumptions in the example. The borrowing behaviour of the counterfactual households is calculated using estimated effects from FI's assessments. We do not take into account fixed interest periods.

<sup>27</sup> Diagrams 8 and 9, which show the interest-to-income ratio and the debt service ratio for actual and counterfactual households, respectively, refer to average values. To limit the influence of extreme values on the averages, the lowest and highest 5 percentiles have been replaced by the value of the 5th and 95th percentiles, respectively, according to the Winsorize method.

<sup>28</sup> The level is based on the market's expectations of the policy rate in Q 1 2023 plus 150 basis points, which was approximately the difference between the average variable mortgage rate and the policy rate at the end of 2021. The market's expectations are almost 0.5 percentage points higher than the Riksbank's forecast. We choose the higher value to illustrate the sensitivity of households.

## 8. Interest-to-income ratio

Per cent



Source: FI.

Note: Interest-to-income ratio refers to interest expense (after interest deduction) for total loans as a percentage of borrowers' disposable income. Refers to new loans (mortgages to buy a home and home equity loans). Borrowers who change banks are not included. Higher interest rate refers to an increase in the mortgage rate by 2.75 percentage points. The shaded bars show how the interest-to-income ratio increases given the higher interest rate.

In order to understand the effects on the borrowers' cash flow over time, it is important to also take amortisation payments into account. The amortisation requirements contribute to the initial loan payments being higher than they would be in the counterfactual scenario. For borrowers who took out a mortgage in 2021, debt service payments were 4 percentage points higher than relative to disposable income than in the counterfactual case (Diagram 9). This difference decreases for households that took out loans in 2016 since the amortisation requirements meant that the borrowers amortised more. The corresponding difference for those who took out a loan in 2016 was therefore 2.3 percentage points.

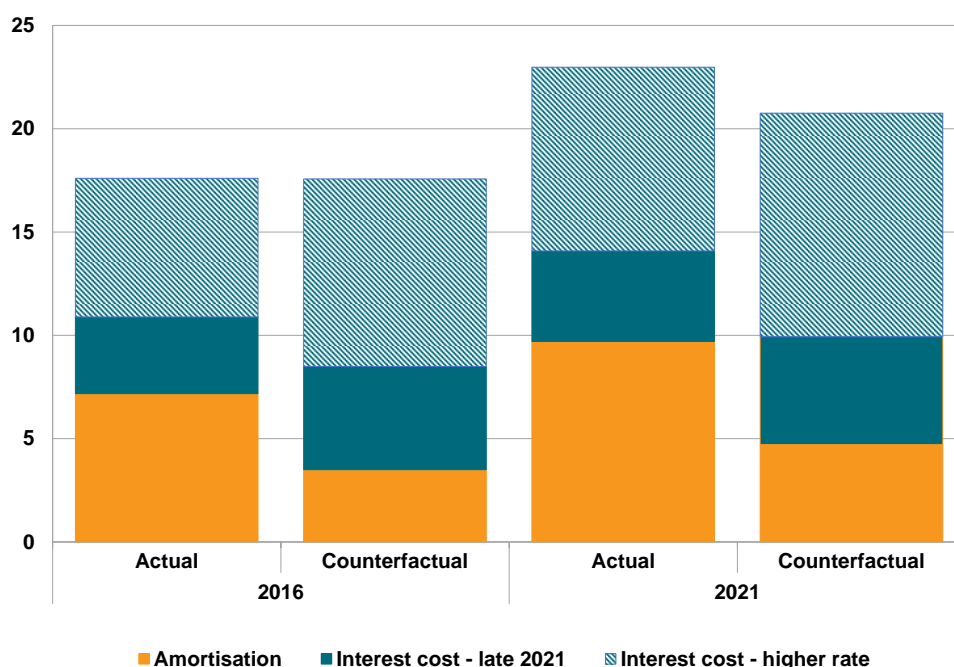
In the scenario where we allow the variable mortgage rate to increase by 2.75 percentage points, the increase in interest expenses is so large for households from 2016 that the debt service ratio becomes just as high in the counterfactual example, with the difference that the counterfactual mortgagor pays more in interest and less in amortisation payments. For households that recently took out a loan and did not have time to amortise, they still have higher debt service ratios on average.

Some households are more affected by the measures, for example those who, in the absence of a mortgage cap, had borrowed more than 85 per cent of the home's value and potentially much more if the amortisation requirements had not existed.

For that type of household, the loans without measures in the example would have been so much larger that the increase in interest expense would have contributed to the debt service ratio being higher than it actually is. Since the debt service payments mostly consist of amortisation payments for the households in question, the households also have the possibility in the event of financial problems to obtain temporary exemption from the amortisation requirements. For the average borrower from 2021 in Figure 9, this would mean a decrease in the debt service ratio from 23 to 13 per cent. For the average counterfactual borrower who is paying less but borrowing more, this type of renegotiated terms would only reduce the debt service ratio from 21 to 16 per cent.

### 9. Debt service ratio

Per cent



Source: FI.

Note: Debt service ratio refers to interest and amortisation payments on total loans as a share of borrowers' disposable income. Higher interest rate refers to an increase in the mortgage rate by 2.75 percentage points. The shaded bars show how the debt service ratio increases at the higher interest rate.

Even if households borrowed less on average due to the measures, there are most likely households that chose not to adjust how much they borrow at all as a result of FI's regulation.<sup>29</sup> Such households would receive the same increase in interest expenses when interest rates rise. Borrowers' ability to handle higher interest rates is also affected by their liquid assets. The lower the liquid assets, the less ability a borrower has to manage spending changes. Some households may have chosen to

<sup>29</sup> The calculations are based on the average effect for different households, which are affected to varying degrees.

replace savings in low-risk liquid assets with amortisation payments even if they had had room for liquid savings. If the initial liquid assets are sufficiently low as a result of this, such households could show a lower resilience even if the change in interest expenses is lower.<sup>30</sup>

## Most mortgagors have significant margins

There is no clear definition of what constitutes a small financial margin. In our mortgage survey, we mainly collect data related to loans, housing and income, but household savings and consumption are also important variables for calculating margins. FI lacks this type of data. By using standardised subsistence costs that depend on household composition and housing type combined with data on income, interest expenses and amortisation payments, we can calculate each household's monthly surplus. Standardised subsistence costs are based on an average of parameters in the banks' credit screening and are similar to the Swedish Consumer Agency's calculations.<sup>31</sup> This gives us an estimate of the households' cash flow margins. As a rule, new mortgagors have a positive cash flow margin even at 6 or 7 per cent interest, which contributes to high margins at lower interest rates.

Just over three-fourths of new mortgagors have more than SEK 10,000 left over per month, and just under one-fourth of new mortgagors have more than SEK 30,000 left over according to such a calculation (see Diagram 10). Approximately 2.5 per cent have less than SEK 2,500 left over. There are households that have received mortgages despite their cash flow being negative. This is usually because they have a repayment capacity that is not reflected in reported income, for example that they have personal wealth or a high income that was temporarily lower at the time they took out the loan.<sup>32</sup>

The group with low margins is above all households that have one adult, live outside the metropolitan regions, and are in the age group 31–50. For households with high income, the standardised subsistence costs are less likely to match the actual level of consumption. For these households, we probably overestimate the actual monthly surplus. At the same time, this means that there is room for such borrowers to reduce their consumption. It is also important to remember that the group we are analysing is mortgagors with new loans who, on average, have borrowed a lot relative to their income. Mortgagors who have had their loans longer likely have larger margins on average. They took out smaller loans relative

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<sup>30</sup> See Almenberg et al. (FI Analysis 33, 2021) for a more exhaustive discussion.

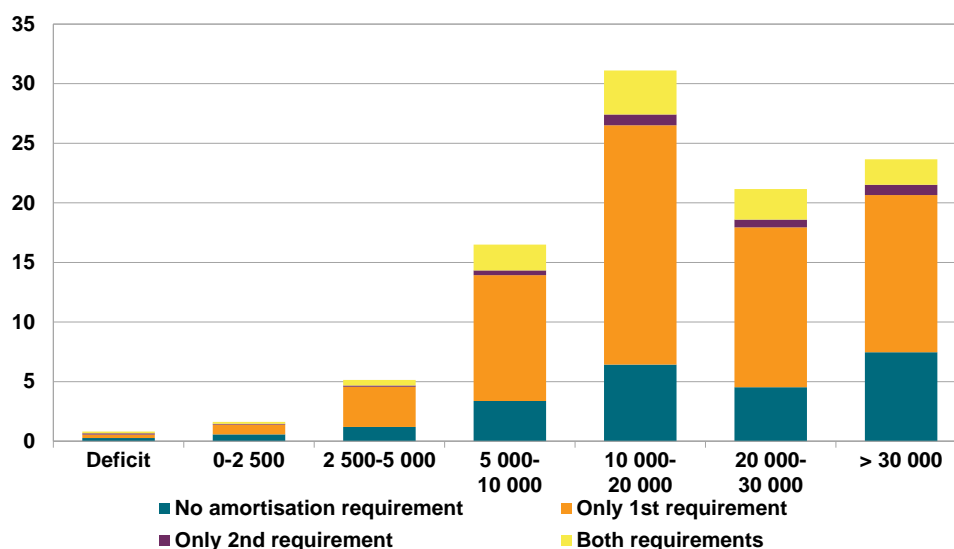
<sup>31</sup> The Swedish Consumer Agency describes the calculations as enabling a reasonable standard of consumption, neither a subsistence minimum nor excess consumption.

<sup>32</sup> As a rule, such loans are only granted after a special examination by the bank, during which the financial circumstances of the potential borrower are specially reviewed.

to their income at origination, and over time their loans have gotten smaller because they have amortised and, in most cases, their income has increased.

### 10. Most new mortgagors initially have significant financial margins

Per cent



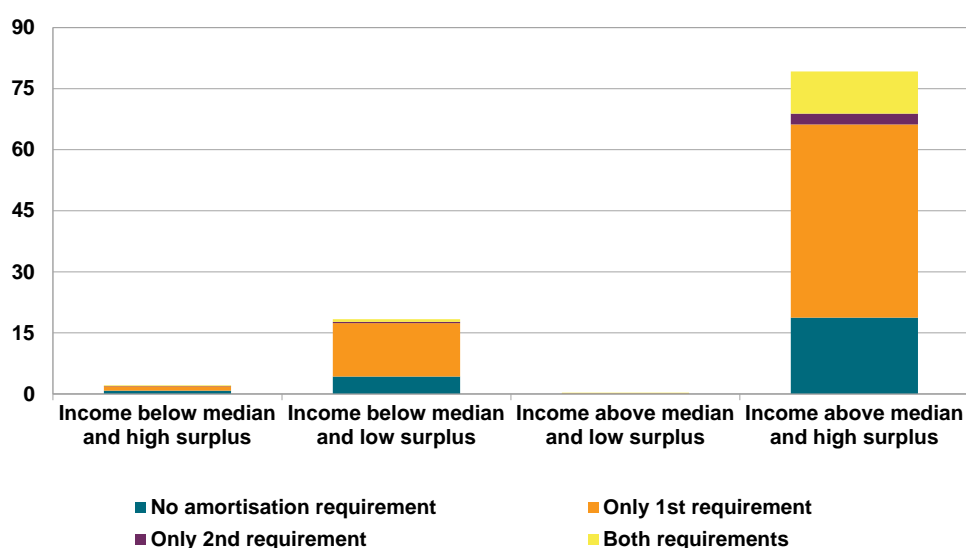
Source: FI.

Note: Shows the proportion of new mortgagors by monthly surplus calculated using current amortisation payments, interest expenses and standardised subsistence costs based on the banks' credit screenings. The bars add up to one hundred, and the colours for each bar show the percentage covered by amortisation requirements.

The extent to which lower income and small financial margins overlap depends, among other things, on how large the mortgagors' loans are since subsistence costs are initially calculated using standard values. Given how the banks' credit screenings work, it is difficult for households with lower income to be granted a loan at all. Above all, they are not granted large loans. Most people with lower income consequently have small enough loans for their monthly surplus to be greater than SEK 2,500 (see Diagram 11). Approximately 2 per cent of the households in the most recent mortgage survey have both an income below the median and a monthly surplus below SEK 2,500. That these households often have smaller loans is also evident in their loan-to-value ratios. Approximately 40 per cent of these households have a loan-to-value ratio below 50 per cent and are thus not affected by the amortisation requirements. It is mainly households with higher income and higher monthly surpluses that amortise according to one of the requirements. This applies in particular to the stricter amortisation requirement.

## 11. Income and financial margins

Per cent



Source: FI and Statistics Sweden.

Note: Households are categorised as income below the median if income per consumption unit is lower than the median. Households are categorised as having a low monthly surplus if the cash flow calculation is lower than SEK 2,500 a month. The bars add up to one hundred, and the colours for each bar show the percentage covered by amortisation requirements.

## Higher housing costs reduce household margins

The calculations above are based on living expenses and interest expenses in 2021. As described in the previous section, both of these have changed significantly in 2022. Below we explain how increased costs mean that more households have small financial margins.

Based on the cash flow calculations above, we calculate how increased inflation, higher electricity costs and interest rates affect households, with a particular focus on households with small financial margins. The calculations are made at the household level, and the data is from FI's mortgage survey in 2021.<sup>33</sup> Households that bought a home in 2021 did so at the highest housing prices observed and have also not had time to amortise very much. The calculations presented here therefore constitute a sort of upper limit for the negative effects that households may experience. Due to the design of the data material, we only know which electricity price is relevant for households in the metropolitan regions of Stockholm, Gothenburg and Malmö. For mortgagors outside the metropolitan regions, we do

<sup>33</sup> See *The Swedish Mortgage Market*, Finansinspektionen 2022.

not know where the home is located, and we therefore can only use examples that apply assumptions about which electricity zone the home belongs to.<sup>34</sup>

To calculate interest expenses in a situation with higher interest rates, we use the average fixed interest term for the borrower as a starting point. For loans with a variable interest rate or a fixed interest term of less than 24 months, we increase the interest rates by 2.75 percentage points.<sup>35</sup> This means that the mortgage rate for these borrowers amounts to approximately 4.25 per cent on average. For loans with a longer term (more than 24 months), we do not change the interest rate.

Each household's expected cost for energy and electricity is calculated as the sum of consumption, fixed charges and VAT/tax. We assume average electricity consumption for different forms of tenure. In reality, there is a large spread in electricity consumption depending on the heating system each home has, how energy efficient the home is and the need for heating in general. As the temperature varies throughout both the year and the different parts of the country, the need for heating also varies. We also assume that the mortgagors have variable electricity contracts and that no support measures are introduced, which means that the higher prices immediately have full impact. A detailed description of the calculation can be found in the appendix *Calculation of household's electricity costs*.

In the wake of announcements about reduced energy deliveries from Russia to Europe, the average spot price for electricity has been up to around 400 öre/kWh in electricity zone 4 and 360 öre/kWh in electricity zone 3, excluding VAT.<sup>36</sup> We assume here that the price may increase further during the autumn and winter to 425 öre/kWh in electricity zone 3 and 500 öre/kWh in electricity zone 4, excluding VAT.<sup>37</sup> For electricity zones 1 and 2, we assume that the price will be 20 per cent higher than the peak listing on a weekly basis in recent months.<sup>38</sup> This means prices of 191 and 192 öre/kWh, respectively. Historically, there are seasonal variations in the price of electricity, but we assume the high price level to illustrate a situation where expenses are at their highest.

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<sup>34</sup> Due to data protection regulations, it is only the households in these metropolitan regions that we can place with complete certainty in the correct electricity zone. Households in metropolitan areas make up 45 per cent of the most recent sample, their loans make up 58 per cent of total loans, and their amortisation payments are 52 per cent of total amortisation.

<sup>35</sup> We choose the same increase as in Diagrams 8 and 9 based on the market's expectation of the policy rate during Q1 2023. See Footnote 28.

<sup>36</sup> See, for example, average weekly prices for Weeks 34 and 35.

<sup>37</sup> The increase of between 18 and 25 per cent is in line with forward prices, which during Week 38 indicated a system price of EUR 400/MWh during the winter of 2022/2023. The prices in electricity zones 3 and 4 are also sometimes higher than the system price. In 2021, the average spot price in electricity zone 4 was 82 öre/kWh and 67 öre/kWh in electricity zone 3. See Diagram 18 in the appendix *Calculation of the household's cost of electricity* for historical differences in prices in different electricity zones relative to the system price.

<sup>38</sup> The peak was Week 36.



We assume that other operating costs for housing and the households' other living expenses have increased by 7 per cent since 2021.<sup>39</sup> We assume that higher interest payments and energy costs have an impact on the monthly fee for households living in tenant-owned housing and that it increases by 15 per cent. Household income after tax is assumed to have increased by 2 per cent.

## Increased electricity costs and interest rates are burdening households

As can be seen in the previous section, many households have relatively good margins initially. But high inflation, higher interest rates and especially higher energy costs inevitably lead to smaller margins.

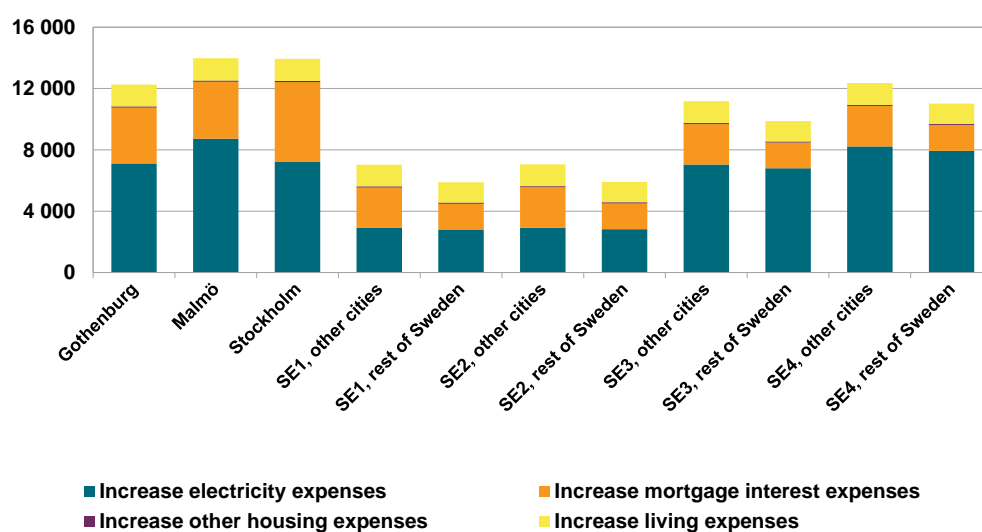
Diagram 12 shows our calculation for the average monthly cost increase for a new mortgagor who bought a single-family home. The biggest increase in costs is in Stockholm and Malmö, with an average of almost SEK 14,000. In Malmö, increased electricity costs account for an average of 57 per cent of the cost increase, while the figure in Stockholm is 52 per cent. At the same time, the cost of rising interest rates is greater in Stockholm due to higher housing prices and thus larger mortgages. The cost increase in Gothenburg is less than in Malmö due to lower electricity price increases and less than in Stockholm due to lower housing prices. In other parts of southern and central Sweden (electricity zones 3 and 4), the cost increases are on average lower than in metropolitan areas due to lower housing prices and mortgages. This reduces the effect of higher mortgage rates. The cost increase is the least in northern Sweden (electricity zones 1 and 2). This is mainly because increases in the electricity price in SEK are significantly lower there.

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<sup>39</sup> This roughly corresponds to CPIF excluding energy for August 2022, which was 6.8 per cent.

## 12. Cost increase for new mortgagors, single-family homes

SEK



Source: FI.

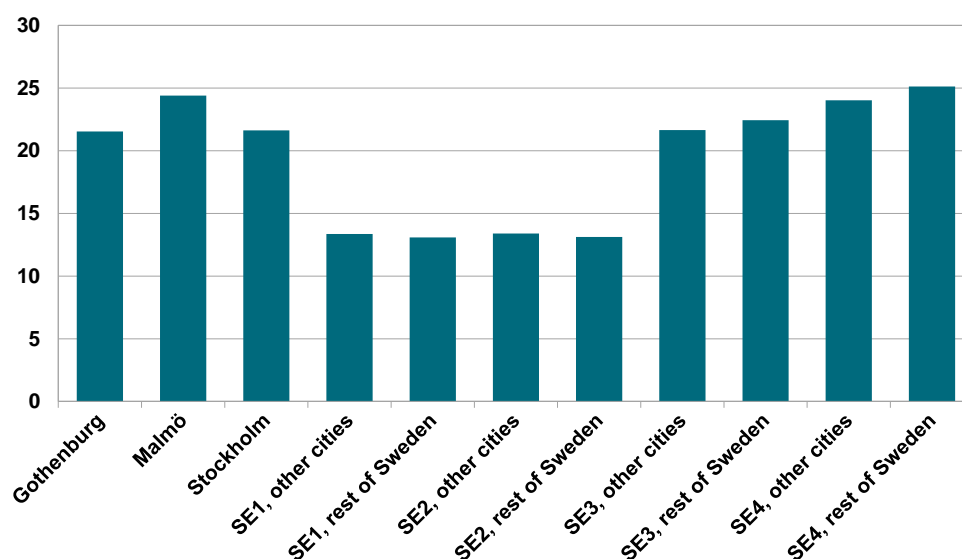
Note: Shows new mortgagors who bought a single-family home. See the appendix for a detailed description of the calculations.

For households living in tenant-owned housing, the cost increase is significantly smaller, from SEK 2,700 in northern Sweden to SEK 6,500 in Stockholm (see Diagram 19 in the appendix). This is mainly because of lower average electricity consumption in tenant-owned housing than in single-family homes. New mortgagors who bought tenant-owned housing are also to a greater extent live on their own in a smaller home.

Since the disposable income differs between different geographical areas, the cost increase should be set in relation to the income in each area. Setting the household's cost increase in relation to disposable income is also relevant since the number of wage-earners in a household, who bear the cost increase, can vary. In Diagram 13, we show the increase in costs as a percentage of disposable income for new mortgagors living in a single-family home. Among the metropolitan areas, the cost increase is greatest for households in Malmö. There, the cost increase in the scenario corresponds to an average of 24 per cent of disposable income. The biggest increase in costs is for households living in the less densely populated parts of electricity zone 4 and corresponds to 25 per cent of disposable income. The price for a single-family home here is only about one-third of the price in Stockholm. This means that the increase in costs from higher interest rates will be smaller. At the same time, disposable income is also significantly lower relative to metropolitan areas, and the increase in electricity costs is about the same in nominal terms. The increase in costs in relation to disposable income will therefore be greater. The cost increase as a share of disposable income is lowest in the northern parts of the country.

### 13. Cost increase as a percentage of disposable income for new mortgagors, single-family homes

Per cent



Source: FI.

Note: Refers to new mortgagors living in single-family homes. Mid-sized cities refer to cities with over 75,000 inhabitants, other than Gothenburg, Malmö and Stockholm. Others refer to communities and municipalities with less than 75,000 inhabitants. For mid-sized cities and the rest of the country, we do not know where the home is located; therefore, we show how the cost increase varies for those groups depending on the assumption of the electricity zone.

For households living in tenant-owned housing, the percentage is significantly smaller (see Diagram 20 in the appendix). Here, it is mainly higher interest rates that are behind the increase in costs. This contributes to the cost increase being highest in Stockholm, where mortgages are the largest. The cost increase in the scenario among new mortgagors in Stockholm is almost 13 per cent of disposable income.

### More mortgagors experience small margins

With the interest rates we are using here, no household experiences a deficit from an isolated interest rate increase. This is because the stressed interest rate used in the credit screening creates a buffer. However, higher interest rates make households more vulnerable to other cost increases. For households that bought a home in 2021, the credit screening did not include any significant buffer for energy price increases.<sup>40</sup> When we add increased energy costs and increased subsistence

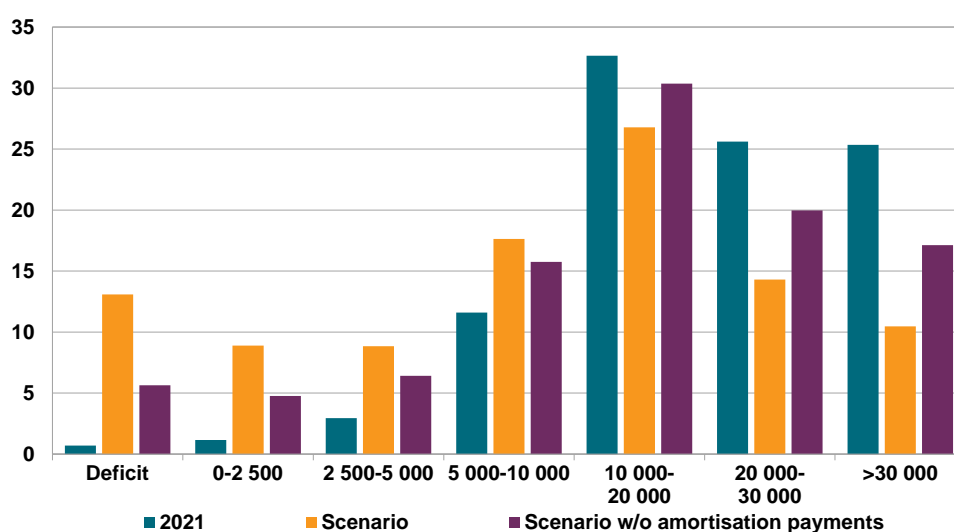
<sup>40</sup> For example, the standard amount for a single-family home was approximately SEK 4,000, which would cover all operating costs, including energy. This appears to be low given today's price levels for electricity.

costs to the increased interest rate costs, a significantly larger percentage of households experience a deficit in the calculation.

In Diagram 14 (single-family homes) and Diagram 15 (tenant-owned housing), we group the households by the size of their margin. We calculate the margin in the baseline (2021), in the scenario with higher costs, and in the same scenario but excluding amortisation payments. Here we assume that all homes in other cities and the rest of the country are in electricity zone 3 in order to be able to show percentages for all new mortgagors.

#### 14. Smaller margins for new mortgagors who bought single-family homes

Per cent



Source: FI.

Note: Shows the percentage of new mortgagors who bought single-family homes according to a monthly surplus calculated in the baseline, in the scenario with higher prices and interest rates, and in the scenario without amortisation payments.

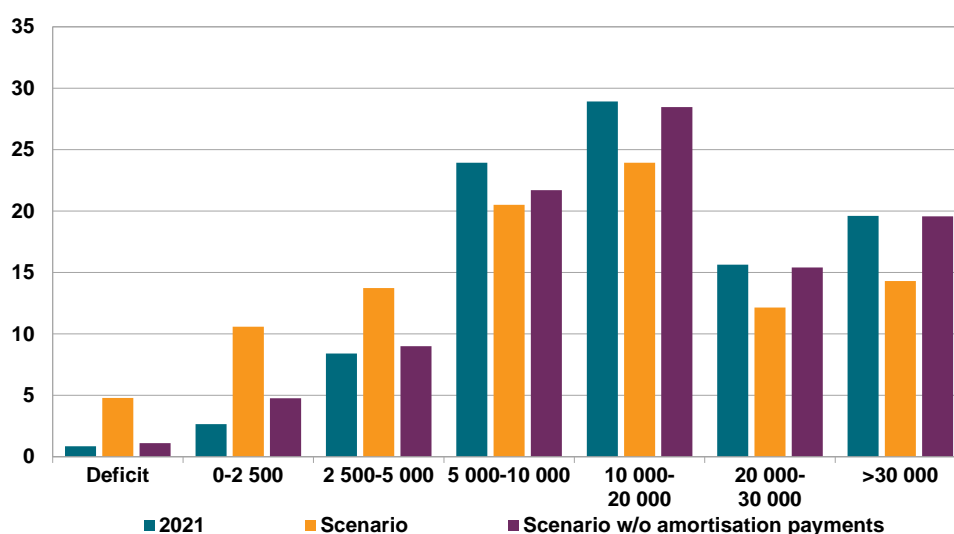
In the baseline, households have relatively large financial margins (see also Diagram 10 for all new mortgagors). For mortgagors who bought a single-family home, over 50 per cent have a margin greater than SEK 20,000 per month and 84 per cent have a margin greater than SEK 10,000 per month. For new mortgagors who bought tenant-owned housing, 64 per cent have a margin of more than SEK 10,000.

When we add the increased costs, household margins decrease. In the baseline, new mortgagors had on average a surplus of SEK 22,000. With the cost increases in the scenario, this figure decreases to an average of SEK 14,500. Among those who bought a single-family home, over 13 per cent experience a deficit in the calculation. The corresponding share for households that bought tenant-owned housing is 5 per cent. This means that just under 10 per cent of all households that

bought a home in 2021 will experience a deficit in the scenario. These households are particularly vulnerable. Among households that continue to have higher income than expenses, just under 10 per cent have only a small margin in the calculation, i.e., under SEK 2,500. The figure among households that bought a single-family home is 9 per cent, and among households that bought tenant-owned housing, the figure is 11 per cent. These households are vulnerable, especially if the cost increases are higher than in the scenario since this would reduce their remaining margin.

### 15. Lower impact for households that bought tenant-owner housing

Per cent



Source: FI.

Note: Shows the percentage of new mortgagors that bought tenant-owned housing based on the monthly surplus calculated in the baseline, in a scenario with higher prices and interest rates, and in a scenario without amortisation payments.

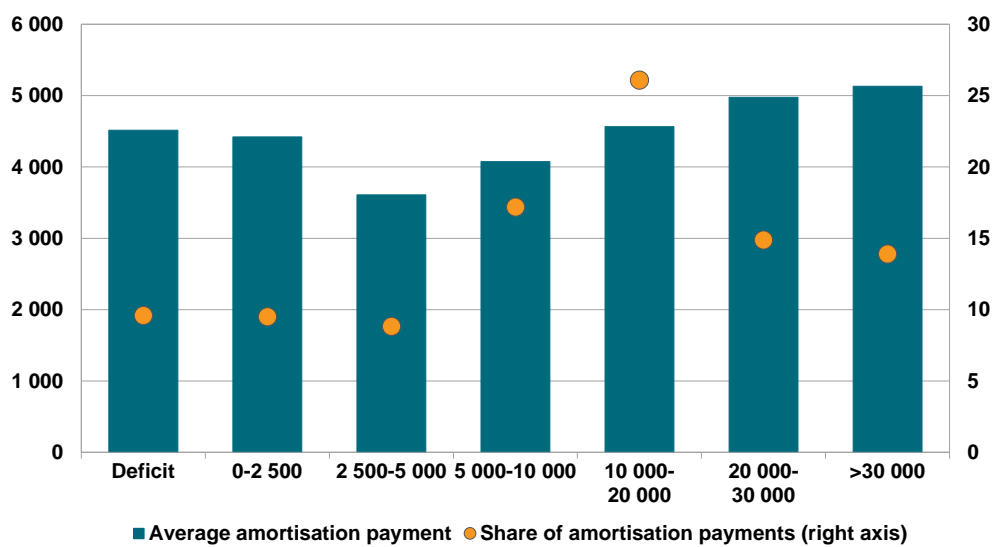
The last scenario shows the margin after the cost increases and excluding amortisation. Without amortisation payments, household margins increase. The percentage of households with a deficit decreases sharply, to 6 per cent for households that bought a single-family home and to 1 per cent for households that bought tenant-owned housing. Among those that bought a single-family home, many still experience significantly lower surpluses without amortisation payments since energy costs greatly affect their margins. For those that bought tenant-owned housing, where energy costs only increase slightly in comparison, the percentages in the scenario without amortisation payments are similar to the baseline since lower amortisation payments to some extent offset the higher interest costs that drive the cost increase in that group.

Amortisation payments are relatively similar on average when we group mortgagors according to their surplus in the scenario. On average, the payments are

highest among those with the largest margins and lowest among those with margins between SEK 2,500 and 10,000 (Diagram 16). Those with margins above SEK 10,000 also account for just over half of the amortisation payments from new mortgagors. Those with deficits and small margins account for roughly 20 per cent together.

## 16. Those with the largest margins amortise the most

SEK and per cent



Source: FI.

Note: Applies to all new mortgagors. The bars (left axis) show how much the borrowers amortise per month on average. The circles (right axis) show the percentage of the total amortisation payments for each group.

## Most mortgagors will need to cut back on consumption

High inflation, higher interest rates and especially sharply rising heating costs will allow for less consumption among most mortgagors. Many households that have large surpluses in standard calculations will need to reduce sharply their (real) consumption or their savings. Some households are also particularly vulnerable, mainly households with lower income that, despite reducing their consumption, risk having a deficit every month and needing to sell liquid assets to cover the high costs. This applies in particular to the beginning of 2023, when electricity costs are expected to be at their highest due to high electricity usage and high electricity prices.

It is important to keep in mind that the calculations above are just that – calculations. There will be considerable variation in how developments will actually affect mortgagors. The expenses for higher interest rates will be greatest in the metropolitan areas where housing prices are highest, and thus also mortgages. Households that have fixed their mortgage rates will be less affected in the near future but will have increased costs over time. Our calculations are based on the

market's expectations for the key interest rate, but mortgage rates could be both higher and lower than the rates we apply in the scenario.

Increased costs for electricity and energy as a percentage of disposable income are greatest for households living in single-family homes outside the metropolitan regions in southern and central Sweden (electricity zones 3 and 4). Here, too, costs can be both higher and lower depending on differences between households and how the development differs from the assumptions made in the calculations. Households' electricity consumption could deviate from the average, electricity prices could differ from the ones we use in the calculation, and there could be support measures that dampen the effect of the price increases on household finances.

Because we use cost-of-living templates that do not depend on income, we underestimate the actual consumption at baseline for those with higher income. This means that the cost increases due to general inflation for many households will be higher and thus also the need to adjust consumption. At the same time, increased costs for those with large margins in the baseline do not necessarily lead to lower (real) consumption but can instead lead to lower savings.

The fact that households' margins shrink sharply does not automatically mean that they will experience financial difficulties. Savings in Sweden have been high in recent years, and many households can use liquid assets to even out consumption. But savings and wealth are also unevenly distributed. Households that experience small margins and do not have liquid assets are most affected.

Finally, the calculations are not representative of all mortgagors. Those that took out their loan several years ago generally borrowed less, have higher incomes today and have amortised their loans. Although they face similar cost increases due to inflation and high energy prices, they have larger margins in the baseline and are less affected by higher interest rates.

## Households that are going to buy a home

How different households are affected by falling housing prices depends to a large extent on where the households are in the life cycle and what their housing needs look like when prices fall.<sup>41</sup> Households planning to enter the housing market, such as young or other first-time buyers, benefit from lower housing prices. Households looking to enter the housing market in this situation face lower prices and therefore need smaller loans for the same home. In the 2021 mortgage survey, the average price for first-time home buyers was SEK 3,200,000. If, for example, housing

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<sup>41</sup> See Almenberg et al. (FI Analysis 33, 2021) for a discussion of households' sensitivity to falling housing prices.

prices were to fall by 20 per cent, the cash deposit required for this type of housing would decrease from SEK 480,000 to SEK 384,000.<sup>42</sup> For the same type of home, the need for a loan would also decrease by 20 per cent from SEK 2,720,000 to SEK 2,176,000. For a household with one adult, an income before tax of approximately SEK 42,000 was required to be granted a loan of SEK 2,720,000. With the lower price, an income of approximately 37,000 would be required instead. The opportunity for first-time buyers to step into the market thus increases with lower prices. On the other hand, the higher interest rates mean that interest costs, at least at the beginning of the loan's maturity, will be significantly higher.

Another group is households that own their home but want to move. They may be in a position where they want to buy bigger and probably more expensive. The fact that they face lower prices can therefore be favourable. This applies especially to households that initially have a lower mortgage and do not lose as much equity in the home when prices fall. For more indebted households, the effect of price changes is greater on equity. Such households may therefore face a stricter credit check and higher amortisation payments if prices on the housing market drop significantly; for example, if they need to amortise more when purchasing a new home because their loan-to-value ratio exceeds 70 per cent or they need to supplement their mortgage with other financing because they are limited by the mortgage cap.

It should also be noted that housing prices in the future may be more affected than before by heating and energy costs. Due to the current events on the market, prices for homes with high energy consumption – all else equal – will decrease more. A household buying a home with high energy consumption will therefore not need to borrow as much and will thus have lower interest costs and lower amortisation payments.

Households that sell a house with high energy costs end up in the opposite situation. They will be paid less compared to other households and run a greater risk of losing all or part of the savings that they built up in the owned home, especially if they bought the home recently or the energy costs are high in relation to the value of the home. FI returns to the importance of households risking losing their equity.

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<sup>42</sup> According to Valueguard, housing prices have fallen by almost 9 per cent since the peak. Forecasts on how much housing prices may fall vary between forecasters, and many believe that housing prices will continue their downward trend from current levels.



## Framework for borrower-based measures

The assignment from the government includes "analysing the extent to which changes to [borrower-based measures] together and individually over the business cycle can contribute to managing risks for highly indebted households and maintaining a good supply of credit". In the first section, we explained FI's macroprudential mandate and the objectives of the borrower-based measures. Below we briefly describe how decisions on borrower-based measures are made since the governance system is closely related to the nature and impact of the tools. Finally, we describe how borrower-based measures could conceivably vary over time, how this is related to the business cycle, and how these conditions affect the management of risks associated with highly indebted households.

### The governance system for borrower-based measures

FI's macroprudential mandate states that FI must "take into account the impact of the measures on economic development". This makes it clear that FI's macroprudential measures must consider other policy areas and that borrower-based measures should not result in, for example, significant imbalances in other parts of the economy. As in all areas, measures must be proportionate to the extent that the impact of the measure on the goal must be large and clear enough to outweigh the negative side effects that may occur in other areas.

FI is responsible for monitoring the developments in the credit market. The risk that financial imbalances will be allowed to grow without being noticed is thus reduced. If necessary, FI proposes measures. If there are measures that involve regulations in the area, the government decides whether a proposal should be implemented or not. Because FI's proposal is public, there is also room for a broad discussion before the government makes a decision. The government's position is also public, which means that its considerations can be reviewed and discussed.

### Time-varying borrower-based measures

FI analyses below the effects of potential changes on primarily the amortisation requirements but also the mortgage cap. Our emphasis is on FI's mandate, but we also consider stabilization and distribution policy aspects, especially in relation to the current situation with higher interest rates and general price increases, not least high electricity and energy prices. In this context, it is necessary to relate the effects of changed borrower-based measures to other means of supporting vulnerable households and to consider how such changes affect other policy areas, in particular monetary policy which operates partly through mortgage interest rates.

## Credit cycle and crises

FI's work with financial stability and countering financial imbalances is primarily preventive. This means that FI mainly introduces regulations of a structural nature that will reduce the probability that the financial system will become unstable and that financial imbalances will become large. Together with the Riksbank and the Swedish National Debt Office, FI is also responsible for crisis management in the event of a crisis or if a crisis is about to break out. However, it is not clear where the line is drawn between structural measures of a preventive nature and crisis measures.

Even if the objective of the borrower-based measures is fundamentally preventive and structural in nature, it is relevant for FI to review the impact of the measures across different economic situations and in particular given the development of the credit and housing markets. This applies, for example, to crises or situations with high probability that the economy or the financial system will enter a crisis. In such situations, it may be important for lenders and households to have greater flexibility in order to counteract the impact of the crisis or that a crisis arises.

One such example was the breakout of the coronavirus crisis and the threat of the exceptional economic downturn that justified wider possibilities for lenders to grant temporary exemptions from the amortisation requirements.<sup>43</sup> This situation was special in that the uncertainty was widespread, for example a large number of mortgagors suddenly faced a significantly higher risk of unemployment. This meant that the accuracy of a general exemption was relatively high. Most mortgagors were impacted, and amortisation relief improved the ability to manage the risks given the exceptional uncertainty that prevailed (see Diagrams 5 and 6 for a comparison of the situation today with when the wider exemptions were introduced). In retrospect, it can be concluded that many of the economic and financial risks that existed in early spring of 2020 did not materialise. One explanation for this is the massive fiscal support measures that were put in place to reduce the effects of the crisis on the labour market and the economy in general.

However, these types of emergency measures often come at a price in terms of higher risks in the medium term. If borrowers and lenders do not have to equally bear the risk of bad outcomes, their incentives to take risk will increase. In FI's evaluations of new lending during the pandemic, we also show that the exemption, together with several other factors, contributed to households borrowing more and buying more expensive homes.<sup>44</sup>

Another scenario where it may be relevant for FI to adjust the measures is in the event of more permanent downturns in the credit cycle. The credit cycle is usually

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<sup>43</sup> See *Finansinspektionen's general guidelines on exemption from amortisation requirements on special grounds*.

<sup>44</sup> See Andersson and Aranki (FI Analysis 34, 2021).

primarily linked to lending, but it is also linked to cycles in asset markets that are closely linked to loan financing, especially the real estate market. These cycles have been described in research as significantly longer than business cycles, and the peak of the cycle has been associated with a higher probability of financial crises or lower future economic growth.<sup>45</sup> Such cycles can arise through financial frictions; for example, if the ability to borrow largely controls assets' value, price changes could become self-reinforcing. Another explanation for the occurrence of cycles is excessively optimistic (or pessimistic) expectations that drive risk-taking and borrowing. A downturn in the credit cycle could mean that it becomes difficult or expensive for many to borrow because lenders become more restrained, at the same time as the downturn implies that the risks associated with household loans become permanently lower. In such a structurally different development with low credit growth, fewer highly indebted households and more permanent difficulties for borrowers to obtain financing, there may be reason for FI to introduce long-term relief to help households gain access to loans to a desirable degree, as long as a healthy amortisation culture is maintained.

FI also has non-borrower-based tools to help ensure that the credit supply is working well. One such tool that is explicitly designed to vary over time is the countercyclical capital buffer. It is supposed to be raised when financial conditions are expansive, so lenders have enough capital during downturns. In the event of crises or structural downturns in the credit cycle, FI can lower the buffer value in order to free up room for banks to maintain their lending by creating greater space up to the capital requirements.<sup>46</sup>

## Relationship to other policy areas

FI is responsible for analysing the need for borrower-based measures based on its mandate to not only prevent financial imbalances but also safeguard financial stability, a high level of consumer protection and well-functioning markets. Use of borrower-based measures, for example to mitigate cyclical disturbances that occur, would make it more difficult to achieve the goals for which the tools are intended. The principle that a tool cannot be used to achieve more than one goal also applies to this policy area.

The main responsibility for stabilisation policies rests with the Riksbank, which via its task of maintaining price stability normally has the possibility of also stabilising the economy. As a complement, there is fiscal policy, which is carried out through so-called automatic stabilisers in tax and expenditure systems and more discretionary changes to taxes and expenditure. The government and the

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<sup>45</sup> See Stein (2021), *Can policy tame the credit cycle*, for a discussion of related research.

<sup>46</sup> See *Application of the countercyclical capital buffer*, Finansinspektionen (2021) for more information.

Parliament control these decisions.<sup>47</sup> Distribution policy is a related policy area that also falls under the responsibility of the government and the Parliament.

Starting from this division of responsibility is particularly relevant when analysing appropriate measures in the current economic situation. A number of concurrent circumstances has led to significant price increases for a range of goods and services. This erodes purchasing power and puts pressure on many lower-income households that already have tight margins. Although such households are usually not mortgagors with large loans, there are exceptions (see Diagrams 14 and 15).

As a reaction to the broad increase in the price level, the Riksbank raised the policy rate in 2022 – thus raising interest rates more generally – with the aim of dampening inflationary pressures and inflation expectations. Monetary policy is conducted through interest rates on mortgages in particular, since this is the largest and most interest rate-sensitive item in many households' finances.<sup>48</sup> Households with loans experience an increase in their interest payments, which goes into effect immediately for those with variable interest rates and gradually for those whose fixed loans are converted to higher interest rate loans. This reduces the room for other expenses.

Problems with changing the amortisation requirements are illustrated by the relationship to monetary policy in the current situation. Changed amortisation requirements would *lower* household debt payments and thus counteract the austerity the Riksbank wants to achieve. This does not match the objective of the amortisation requirements and FI's mandate. It could also cause the Riksbank to raise the policy rate further to achieve the tightening effect it deems necessary to contain inflation. In this case, the result would be even higher mortgage rates, with an unclear net effect on household debt payments and financial conditions in general.

It is also notable that regulations on the mortgage market are based on banks granting loans based on careful credit screenings. Banks' credit screenings include, among other things, a stress test for higher interest rates. This aims to ensure that households do not take out larger loans than they have money for after other expenses, even if lending rates were to rise significantly. Data from FI's mortgage survey show that that objective is being achieved: borrowers in general have the capacity to handle interest rates that are clearly above current levels.<sup>49</sup> In this regard, what has happened so far with mortgage rates has already been taken into

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<sup>47</sup> For a current analysis of the division of responsibility between monetary and fiscal policy, see Calmfors, Hassler and Seim (2022), *Samspel för stabilitet – en ESO-rapport om rollfördelningen mellan finans- och penningpolitik*. A summary is available in English.

<sup>48</sup> See, for example, Stockhammar et al. (2022), *How has the impact of the policy rate on consumption changed when the debt-to-income ratio has risen?*, Economic Commentary, Sveriges Riksbank.

<sup>49</sup> See, for example, *The Swedish Mortgage Market*, Finansinspektionen (2022).

account. The interest rates that are expected to prevail in the near future are in and of themselves high in comparison to what we have seen in recent years, but they are relatively low in comparison to historical interest rates and the stressed interest rate used in credit screenings. They therefore do not in and of themselves constitute a reason to change the application of the amortisation requirements. Lenders have analysed high interest rates, informed mortgagors about them and taken them into account when the loans were granted.

Removing the amortisation requirements would thus go against current monetary policy. There is reason to also highlight how changed amortisation requirements would work in relation to financial and redistribution policy. As we noted above, the economy is currently characterized by sharply rising prices for a range of goods and services. This erodes purchasing power and puts pressure on many lower-income households that already have small margins. This applies in particular to households that also depend on electricity for heating. It is possible to save electricity or steer consumption toward times when the price is lower, but in the short term it is not possible to change the heating system. Support for these households, which have suffered what can be called an expenditure shock, may therefore be well justified.

However, changing the amortisation requirement is not a reliable means of supporting households with small margins. For example, banks' credit screenings imply that households with small margins very rarely have large mortgages and therefore neither have large amortisation payments. Often, they do not own their home and therefore have no mortgage. Many of those who own their home do not have a mortgage or their loans are so small that they are not covered by the amortisation requirements. Changing mortgage regulations is not much help to them, either.

However, a general exemption from the amortisation requirements is also not a sure-fire measure for those who amortise according to the requirements.

*First*, many have amortisation payments that are small in relation to how much the costs of electricity and other necessary consumption could now rise. This group includes in particular households located outside of the metropolitan areas that have bought less expensive homes and have not taken out large loans. For them, a general change to the requirements does not make that much of a difference. The most vulnerable can receive individual exemptions according to current regulations; see p. 10.

*Second*, most money would be freed up for those with large loans (see Diagram 16). This group includes many who live in apartments in big cities, often with district heating. They rarely have large electricity bills and often good margins. It is

therefore not a vulnerable group. Instead, it is the collision with monetary policy that becomes extra clear here.

*Targeted* efforts are required, rather, for the most vulnerable. Closest to hand are income supplements for households with unexpectedly high expenses (without removing the motivation to save electricity). FI is not an expert on *how* such support should be designed, but targeted support to households with small margins that have been exposed to an expenditure shock seems reasonable in terms of redistribution policy. Support specifically for households that would otherwise be forced to drastically reduce their other expenses can also contribute to dampening undesirably large falls in private consumption. Regardless of the exact motives, the responsibility lies with the government and the Parliament.

FI therefore makes the assessment that it is inappropriate to change the amortisation requirements in the current situation. Their objective is to safeguard financial stability and counteract financial imbalances. If the requirements are changed, it should be for the same objective.

## Borrower-based measures in today's situation

### Exemption from the amortisation requirements

The implication of the amortisation regulations is that a lender must apply certain specific amortisation conditions for new loan agreements. However, if there are special grounds, the lender may grant exemptions from the amortisation requirements. This flexibility has existed since the amortisation regulations were introduced and aims to ensure that amortisation payments for households experiencing financial difficulties should not have an excessive impact on their personal finances. The aim of the design is also to allow lenders to handle customers who experience payment difficulties. This corresponds to a large extent to the flexibility that lenders have always had in their relationship with individual borrowers who experience payment difficulties.

This means that the amortisation regulations already currently give lenders an opportunity to grant temporary exemption to a borrower who is experiencing financial difficulties and therefore is having difficulty making amortisation payments in accordance with their agreement with the lender. The borrower's financial circumstances may have deteriorated significantly due to an unforeseen loss of income or an increase in expenditure. Given recent developments, the financial circumstances of many households could change significantly, particularly those that have, or will have, high electricity costs relative to their income due to exceptionally high energy prices as shown in Diagrams 12 and 13.

The special grounds should refer to circumstances attributable to the individual borrower and that could not have been foreseen when the agreement was entered

into. Ultimately, it is up to the banks to assess their borrowers and decide which temporary relief measures are in the best interests of both the lender and the borrower based on the applicable regulations.

However, what is said above about the special grounds referring to the individual borrower does not apply without exception. The special grounds, as set out in the general guidelines decided by FI in 2020, an exception could be a very strong downturn in the Swedish economy. This possibility has a limited scope and was developed to meet the exceptional slowdown in economic activity and sharply higher unemployment expected in the wake of the outbreak of the pandemic in early 2020. Currently, FI makes the assessment that neither the prevailing uncertainty nor the decline in real income justifies a right for the banks to grant general exemptions.

### Measures and credit supply

Households that take out a new mortgage are affected by both the amortisation requirements and the mortgage cap. These measures impact borrowing possibilities depending on the borrower's income and wealth and the willingness to take a loan that is impacted by, among other things, the effect of the measures on debt-service payments (interest and amortisation payments). For mortgagors looking to borrow to buy a home and enter the housing market, their *opportunities* for buying a home improve when prices fall.

For mortgagors looking to buy a larger home (or for other reason a home that is more expensive), there is generally a similar effect, but at the same time there are exceptions where the equity in the home can decrease as a result of lower housing prices to the extent that it is not enough for the downpayment for the new home. For example, the household may be limited by the mortgage cap or the new LTV ratio has more of an impact on the household than the first amortisation requirement. Banks can also choose to become more restrictive in their credit screenings, which would in such cases dampen the any increased opportunities.

Households looking to switch to a smaller or more inexpensive home lose out when prices are lower much like those who want to leave the owner-occupied housing market. Because there are groups that risk having a residual debt when selling a home, price drops can decrease mobility in the housing market and the way it functions.

Even if the opportunities to enter the housing market generally increase when housing prices fall, the *willingness* to borrow can decrease at the same time. Right now, this could be, for example, because households prefer to maintain their consumption of other services or goods that have increased in price or that actual and expected interest costs increase even if the loan amount needed is smaller.

The mortgage cap has a built-in flexibility in that it limits the mortgage in relation to the price of the home. The total LTV ratio, i.e., home loans with collateral (mortgages) and home loans without collateral (unsecured loans) relative to the home's value, can still be higher than 85 per cent. Households that have large loans in relation to the value of the home could be more reluctant to supplement mortgages with unsecured loans when price levels fall to the point that many former home buyers have homes that are worth less than when they bought them. When prices fall sharply, and therefore wealth is lower, more households may need to supplement their mortgage with unsecured loans if they want to buy more expensive homes. It is important then that the market works well with robust credit checks and contract terms that reflect the risk profile.

The mortgage cap and amortisation requirements have generally increased the resilience of households that take out mortgages. They have contributed to households taking smaller loans and buying less expensive homes. These requirements, together with banks' credit screenings, have meant that new mortgagors have margins both in their cash flow and in the size of the loan in relation to the value of the home. The current situation of higher spending and lower housing prices underscores the value of having margins to better manage such disruptions.

However, borrower-based measures also involve costs for some households. For households that have a strong repayment capacity via good income but lower wealth, the mortgage cap means that their borrowing capacity is limited unless they turn to the unsecured loan market as a supplement to mortgages. At the same time, an unsecured loan can mean unfavourable lending terms for the household. When the mortgage cap was introduced, it was common for new mortgagors not to amortise despite very high LTV ratios. With the introduction of the first amortisation requirement, this problem has disappeared. In this situation, it was not relevant to review the level of the mortgage cap given the risk profile at the time, with mortgages, housing prices and the percentage of highly indebted households all rapidly growing. In today's situation with falling housing prices, the group of second-time buyers who are limited by the mortgage cap can increase rapidly and thus also the use of unsecured loans.

The fact that there is an imbalance between how expected income and wealth affect lending opportunities and assessments of repayment capacity contributed to the opening of an investigation into state-guaranteed first-time buyer loans. The last few years of rising housing prices have meant that many who have been negatively affected by that imbalance have been first-time buyers. The current development underlines that the groups affected vary over time. Based on FI's mandate, the point of departure is that lending opportunities are determined by overall repayment capacity. The point of departure should not be which borrower group the household belongs to. Even if many in this category were first-time buyers up until last



summer, there are also other groups that are, or will be, negatively impacted by the imbalance. For example, if young second-time buyers have to relocate for work to a location with significantly higher prices or if a recent home buyer could soon become a second-time buyer at significantly lower prices and therefore with less equity in the home. The fact that unsecured loans as a supplement to mortgages are currently mainly offered by actors that apply high interest mark-ups could create additional costs for the borrowers if several groups start to apply for this type of financing. FI intends to analyse in more detail the design of the mortgage cap and how the market for unsecured loans functions. If the recent development with higher interest rates, lower risk-taking and lower housing prices continues over a longer period of time, the risks related to household mortgages may decrease. There may then be grounds for FI to raise the level or in some other way facilitate households with limited equity but that due to their income have repayment capacity.

## Conclusions

The borrower-based measures that FI introduced have together meant that Swedish mortgagors have lower loans, in relation to both the value of their home and the household's income, than they would otherwise have had if the measures had not been introduced. This means that today they are seeing a smaller increase in their interest costs. This enables them to better handle challenges such as rising interest rates, high inflation and high electricity prices.

Based on the current economic development with broad and high inflation, higher interest rates and exceptionally high electricity prices, some households will experience financial problems. This applies especially to those with lower income and those who had small financial margins to begin with. Overall, households in both of these categories rarely have mortgages. The combination of amortisation requirements, the mortgage cap and banks' credit screenings have contributed to most households with mortgages having good margins to offset different types of shocks that either affect household cash flows or the value of homes. For mortgagors who face significantly deteriorated financial circumstances that cause them to have financial difficulties, it is possible for the lender to grant temporary exemption from the amortisation requirements so the mortgagor, and the lender, can better handle the situation. The possibility of granting an exemption is an option for the lender and not an obligation, and such exemptions are decided first following an individual assessment of the mortgagor's finances. At the same time, FI's analysis shows that a more widespread use of the temporary exemption for individual borrowers would significantly reduce the percentage that ends up with a deficit.

Similar effects on the share with a deficit could be achieved with a temporary general exemption, much like what happened during the pandemic. However, the accuracy would be low here, with negative side effects such as going against the current direction of monetary policy and further driving up debt in the longer term.

FI's measures have been introduced for structural and preventive reasons and are not meant to be redirected or changed during the business cycle. The risks associated with households' large debts have increased for a long time due to low interest rates, a tax system that provides incentives to take out large loans and large increases in both mortgages and housing prices. There may be grounds on which to change measures in the event of persistent and significant declines in lending, i.e., if the structural risks associated with household debt are permanently reduced. There may also be grounds on which to *temporarily* alter the measures if this would contribute to strengthening financial stability, preventing a financial crisis, stabilising the credit market or making it easier for households during exceptional situations such as very large downturns in the Swedish economy.

FI currently makes the assessment that a temporary general amortisation exemption, as at the beginning of the pandemic, is not a well-balanced measure. The current state of the economy is significantly different than in the spring of 2020. Economic forecasts may be negative and the outlook uncertain, but they are nowhere near as negative as at the beginning of the pandemic. In addition, such an easing of the amortisation requirements in today's world would have low accuracy and go against the direction of monetary policy. If the economic development were to decline substantially and it were possible to avoid going against monetary policy aims, FI's overall assessment regarding the possibility of granting temporary general exemptions may change.

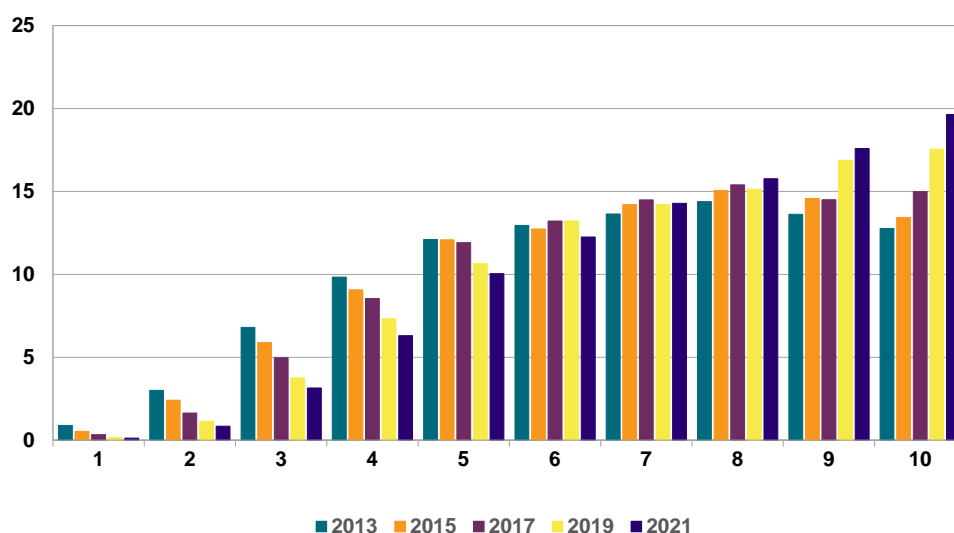
In economic downturns, households' cash flows can deteriorate. The idea behind structural measures that affect cash flow is that households (and lenders) must consider this at the time the loan is granted. The fact that banks consider amortisation payments conditional on different economic situations is part of the reason why the amortisation requirements contribute to households borrowing less. At the same time, individual households may still experience financial difficulties. That is why there are opportunities for lenders to grant temporary exemptions given special grounds.

# Appendix

## New mortgagors' income over time

### 17. Mortgagors by income distribution over time

Per cent



Source: FI and Statistics Sweden.

Note: The income deciles are defined by disposable income per consumption unit. Income for mortgagors is income after tax.

## Calculations of interest-to-income and debt service ratios

### Assumptions for scenario calculations

The scenario calculation on pp. 17–19 is based on estimates in FI Analysis 10, 12 and 17. According to FI's estimates, the mortgage cap has meant that households with new mortgages that are subject to the mortgage cap borrowed an estimated 13 per cent less than they would have if the mortgage cap had not been introduced.

Those affected by the first amortisation requirement borrowed 9 and 14 per cent less, respectively. The lower figure is for households with an LTV ratio between 50 and 70 per cent, and the higher figure is for households with an LTV ratio above 70 per cent (households that amortise 1 and 2 per cent, respectively). Those affected by the stricter amortisation requirement took out mortgages that were on average 8.5 per cent lower than they would have if FI had not tightened the requirement (see Panel A in Tabell 1 for a summary of the effects).

The regulations have affected borrowers to varying extents. The first amortisation requirement covered the largest percentage of households, 60 per cent, compared to 18 per cent affected by the mortgage cap and 11 per cent affected by the stricter amortisation requirement. The estimated effects can be weighed together for all

households in the mortgage survey to estimate the measures' total impact on new mortgagors. FI's analyses show that the mortgage cap has reduced household debt by an average of 2.1 per cent. Taken together, new mortgagors' debt service ratios for total loans and mortgages alone have been 2 and 9 per cent lower, respectively, as a result of the amortisation requirement. Following the stricter amortisation requirement, new mortgagors borrow an average of 1.5 per cent less to buy a home. At the same time, the analyses show that households would have amortized less without the regulations, which means that the mortgages would have been larger today than what they actually are.

To illustrate how actual and counterfactual mortgagors are affected by rising interest rates, we take a closer look at mortgages taken out in the years 2016 and 2021. We perform the calculations in nominal terms, and an important assumption is that there have been no revaluations of the mortgages taken out in previous years. We start from the original LTV ratio and extrapolate the income as of 2016 at approximately 2.4 per cent per year, in line with the average increase in nominal wages for the entire economy during this period according to the Swedish National Mediation Office. We use the mortgages from the 2021 sample as they were reported. At the same time, we extrapolate mortgages taken out in 2016 to 2021. We do this by assuming that households have amortised as agreed when the loans were granted. With five years of amortisation, the households that took out loans in 2016 would have been able to reduce their mortgages relative to when the mortgages were taken out. Since the calculations are based on the mortgage survey from 2021, we assume that households that took out mortgages in 2021 did not have time to amortise their loans. For example, the total amount of credit on collateral objects (including new lending but excluding unsecured loans) was on average SEK 1,782,962 in 2016. These amounts were amortised down to SEK 1,623,165 in 2021. It is the latter amount that is included in the scenario calculation as the households' actual loans for loans taken out in 2016.

We assume that the counterfactual households have taken loans that are larger than the actual loans in FI's mortgage surveys over the years, in line with FI's analyses, which have shown that households borrow less than they would have without the measures in place. In the scenario calculation, we extend the threshold values to also include households that may have been marginally affected by the regulations. We assume that households with an LTV ratio of up to 45 per cent and an LTI ratio of up to 440 per cent have taken out mortgages of the same size as the actual households in the sample. We extrapolate the mortgages by 9 and 14 per cent, respectively, for households with LTV ratios between 45 and 68 per cent and 68 and 83 per cent, corresponding to households that must amortise 1 and 2 per cent, respectively. When extrapolating the mortgages, we assume that households with LTV ratios above 84 per cent have taken out loans that are 28.8 per cent larger than the actual loans in the samples. This is a combination of FI's analyses concluding that the mortgage cap has dampened mortgagors' new loans by 13 per cent but also

that the first amortisation requirement dampened mortgages by 14 per cent for households that as a result of the requirement must amortise 2 per cent, that is households with LTV ratios above 70 per cent. These extrapolations apply to mortgages taken out each year since both the mortgage cap and the first amortisation requirement were introduced in 2016. We also assume in the scenario calculation that households that took out a loan in 2021 may be subject to the stricter amortisation requirement. As a result, we assume that the counterfactual households with LTI ratios above 440 per cent take out mortgages that are 8.5 per cent larger than they otherwise would have (see Tabell 1 for a summary of the effects on LTV ratios and LTI ratios).

Tabell 1. Summary effects scenario calculation interest rate sensitivity

<b>A: Estimates FI Analysis 10, 12 and 17</b>				
	LTV ratio, per cent			
LTI ratio (total mortgage/gross income)	(0,45]	(45,68]	(68,83]	(83,100]
<= 440	0	9	14	13 + 14
>440*	8.5	9 + 8.5	14 + 8.5	13 + 14 + 8.5
<b>B: Increases in the scenario calculation</b>				
	LTV ratio, per cent			
LTI ratio (total mortgage/gross income)	(0,45]	(45,68]	(68,83]	(83,100]
<= 440	1.00	1.10	1.16	1.34
>440*	1.09	1.20	1.27	1.46

Source: FI.

Note: Panel A shows the estimated effects of the mortgage cap and the first and stricter amortisation requirements that were calculated in FI Analysis 10, 12 and 17. Panel B shows the increase factor for the counterfactual mortgages in the scenario calculation. The effect on, for example, households with an LTV ratio of over 83 per cent and an LTI ratio of up to and including 440 per cent, is calculated as follows:  $\frac{1}{(1-0,13)} \times \frac{1}{(1-0,14)} = 1,34$ .

\*The increase for households with an LTI ratio above 440 per cent is only applied from 2018 onwards.

We also assume that the rate of amortisation for the counterfactual loans for 2016 without the requirements would have been equal to the median rate of amortisation for each group during the period 2011–2015, the years before FI's measures came into force. For example, the total amount of credit on collateral objects (including new lending but excluding unsecured loans) for the counterfactual household, increased in accordance with FI's evaluations, was an average of SEK 2,040,547 in 2016. These counterfactual amounts were amortised down to SEK 1,969,877 in

2021 using the rate of amortisation rate that applied to the years 2011–2015.<sup>50</sup> The latter amount is included in the scenario calculation as the households' counterfactual borrowing for 2016.

## Calculation of the household's cost of electricity

The annual consumption of electricity is assumed to be 20,000 kWh for the average single-family home. For tenant-owner housing, the association is assumed to be responsible for heating and the household for other electricity consumption, which for the average tenant-owned unit is assumed to be 2,000 kWh. Consumption per square meter is obtained by dividing average consumption by the average size of the homes in the mortgage survey. This gives a consumption of 145 kWh per square meter and year for a single-family home and 26.5 kWh for a tenant-owned unit.

Geographically, the mortgage survey has information about which of five regions the home is in.<sup>51</sup> This means that homes in Stockholm County, Västra Götaland County and Skåne can be placed in the correct electricity zone. For other homes, we use an equal weighting between the electricity price in electricity zones 3 and 4, respectively. For homes in electricity zones 1 and 2, the cost of consumed electricity will therefore probably be overestimated.

The market price of electricity is calculated as the average of the monthly prices for the respective year and electricity zone. Each household is assumed to have the average distribution between variable and fixed electricity contracts. Information on electricity prices and fixed price periods for electricity contracts is obtained from Statistics Sweden.

When VAT on electricity consumption (25 per cent) and the annual fee to the electricity trading company (approximately SEK 300) are also added, the cost of the ongoing electricity consumption for home  $i$  now becomes

$$(1) \text{ Cost of electricity consumption}_i = sqm_i * \frac{\mu_{consumption}}{sqm} * price_{Electricity\ zone\ j} * 1.25 + 300$$

The energy tax on electricity consumption has increased from 28.3 öre/kWh in 2011 to 35.6 öre/kWh in 2021. The energy tax is also subject to VAT. The energy tax for home  $i$  therefore becomes

<sup>50</sup> See, for example, *The Swedish Mortgage Market*, FI 2016 for a description of mortgagors' amortisation payments during the period.

<sup>51</sup> The regions are Stockholm County, Västra Götaland County, Skåne, Mid-sized cities (cities with more than 50,000 inhabitants other than Stockholm, Gothenburg and Malmö), and the rest of the country.

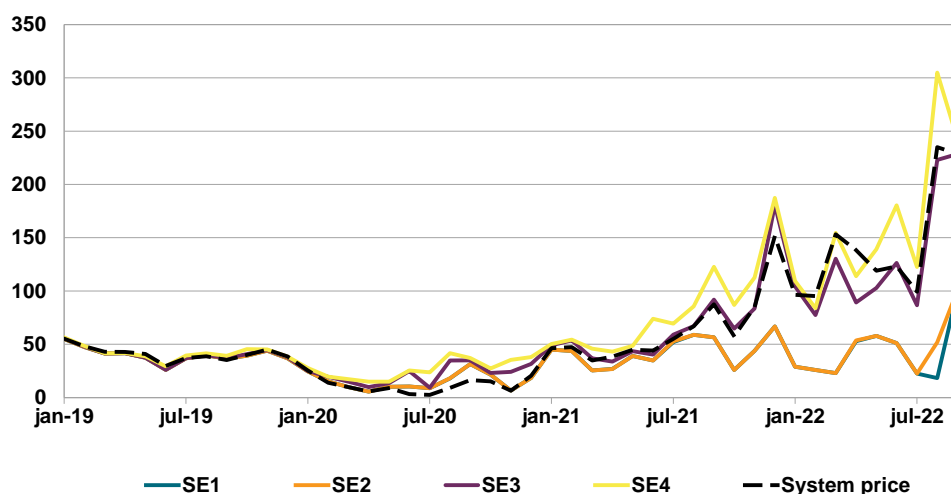
$$(2) \text{Energy tax}_i = sqm_i * \frac{\mu_{consumption}}{sqm} * \text{Energy tax} * 1.25$$

Electricity network charges consist of a fixed fee, a power fee and a transmission fee. Standard amounts are used here. The total cost of the power fee and the transmission fee for a single-family home is assumed to have increased from SEK 4,374 in 2011 to SEK 5,000 in 2021. For a tenant-owned home, the combined cost of the power fee and the transmission fee is assumed to be one-tenth of that of a single-family home. The fixed network fee is assumed to have increased from SEK 1,071 in 2011 to SEK 1,224 in 2021.

$$(3) \text{Fixed network costs}_i = + \mu_{\text{Fixed fee}} + \mu_{\text{Power fee+transmission fee}}$$

The household's total cost of electricity is then obtained by calculating the sum of (1), (2) and (3).

## 18. Spot prices on the electricity market for different electricity price zones Öre/kWh



Source: Refinitiv Eikon and Nord Pool.

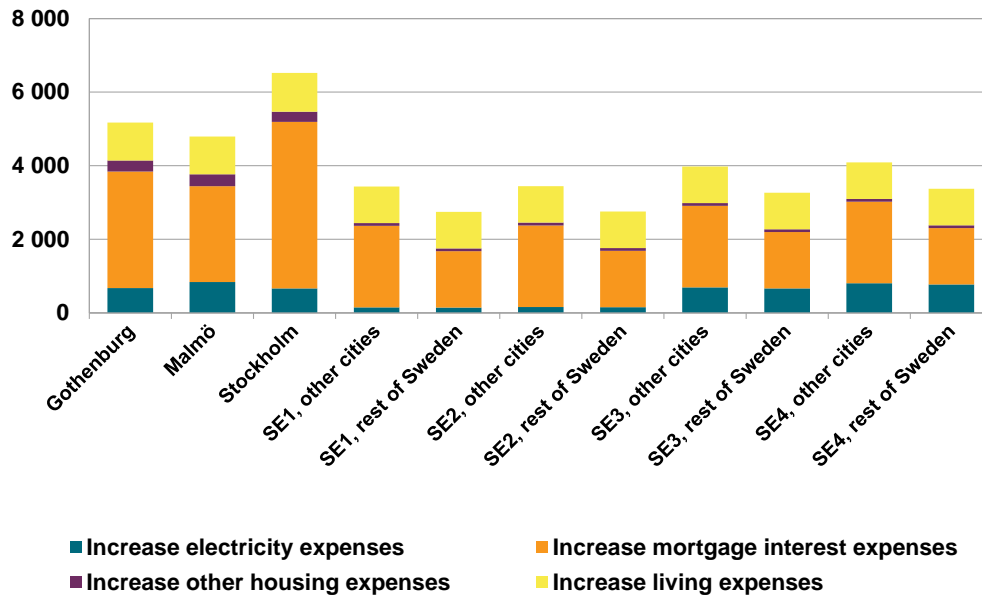
Note: Refers to prices per month in each electricity price zones as well as the system price.



## Increased costs lead to smaller margins

### 19. Cost increase for new mortgagors, tenant-owner housing

SEK

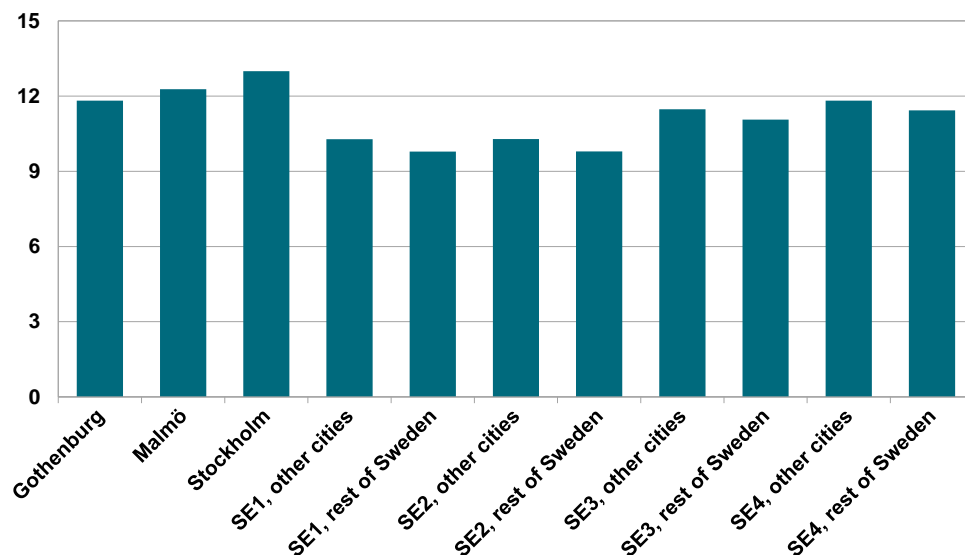


Source: FI.

Note: Shows new mortgagors who bought a tenant-owned unit. See the appendix for a detailed description of the calculations.

### 20. Cost increase as a percentage of disposable income for new mortgagors, tenant-owned units

Per cent



Source: FI.

Note: Refers to new mortgagors living in tenant-owned units. Mid-sized cities refer to cities with over 75,000 inhabitants, other than Gothenburg, Malmö and Stockholm. Others refer to communities and municipalities with less than 75,000 inhabitants. For mid-sized cities and

## FINANSINSPEKTIONEN

Borrower-based measures following high inflation and rising interest rates

the rest of the country, we do not know where the home is located; therefore, we show how the cost increase varies for those groups depending on the assumption of the electricity zone.