

# STAFF MEMO

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adequate

NR. 8 | 2022

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ISSN 1504-2596 (online)  
ISBN 978-82-8379-246-1 (online)

# Norwegian homeowners' debt-servicing capacity is adequate\*

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*Norges Bank, Financial Stability*

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## Summary

Debt-servicing capacity is a function of both available cash flow and the size of obligatory expenses. We use household level information to calculate normal expenses that cover food, other general consumption, electricity and fixed housing expences, as well as interest expenses. We link this to information on household income, debt, financial wealth and housing wealth. Just over 1 percent of home-owning households lacked income to cover normal expenses and interest in 2020. Half of these had the opportunity to cover the liquidity deficit by drawing on financial wealth or increasing their mortgages. We show how higher food and electricity prices, and also higher interest rates, affect the number of households with weak debt-servicing capacity and the share of debt held by this group. The share of households that might experience debt servicing problems will increase with a rapid and marked increase in interest rates. Given the debt-to-income ratio in 2020, it is only when the interest rate rises above 5 percent that the share facing problems rises markedly in groups other than those with the lowest income.

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\*The views and conclusions expressed in this publication are those of the authors and are not necessarily shared by Norges Bank. They must therefore not be reported as Norges Bank's views. We would like to thank Henrik Borchgrevink and participants at seminars at Norges Bank for their input and comments. The authors are responsible for any errors and omissions.

## 1. Introduction

Over the past year, prices for some essential goods, such as food and electricity, have increased. The interest rate level has also risen and is expected to rise further. Norwegian households are heavily indebted and the vast majority have floating interest rates. Household borrowing rates therefore largely follow changes in interest rates, and both higher prices and interest rates affect household finances fairly quickly (see [Poppe and Kempson \(2022\)](#)). In this analysis, we look at how higher prices and interest rates affect households' debt-servicing capacity.

Banks are the main source of credit in Norway. Large bank losses may lead to lower access to credit and amplify a downturn. More than 90 percent of banks' loans to households are secured on dwellings. About 70 percent of households own their own dwelling. Home purchases are the main source of debt (see [Torstensen \(2020\)](#)). Debt entails interest expenses. Homeowners face substantial fixed expenses, for example, in the form of direct and indirect taxes. In addition, there are expenses for heating. Given that residential mortgage loans account for a dominant share of bank lending, we delimit our study to homeowners.

Debt-servicing capacity means having sufficient cash flow or liquid wealth to cover normal expenses and costs associated with servicing loans. In a well-functioning credit market, most consumers will have satisfactory debt-servicing capacity when taking up loans<sup>1</sup>), but this may change in the event of changes in life circumstances or economic conditions. Idiosyncratic changes, such as divorce or illness, may have a major impact on individual households, but do not normally have significant macroeconomic effects. On the other hand, changes in economic conditions, such as higher interest rates, higher unemployment or a decline in real wages, may have a broad impact across large groups of households. In this study, we calculate the number of households with weak debt-servicing capacity in 2020, which is the latest year for which we have complete data. We then calculate how the number of vulnerable households is affected by changes in interest rates and the cost of living.

Since the mid-1990s, losses on loans to households have been low. With higher costs, more people will be at risk of not being able to cover normal expenses and interest. In order to understand the consequences for banks and financial stability, we need

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<sup>1</sup>To the extent that the market itself does not ensure that borrowers have satisfactory debt-servicing capacity, the Norwegian authorities have introduced a lending regulation that sets requirements for loans to households (see [Regulation on financial institutions' lending practices \(Lending Regulations\)](#)).

to be able to quantify how many households this applies to and how much of the debt this group holds. We also seek to determine whether this group's savings can cover such a liquidity deficit for a period. If the group of vulnerable households were to increase markedly, banks' losses on loans to households can also be expected to increase over time.

We start with the latest series of figures from Statistics Norway's income and wealth statistics ([Statistics Norway \(2022b\)](#)), which cover up to and including 2020. The statistics are based on information from the tax return of the persons living in the same dwelling unit (household). We then calculate normal expenses for home-owning households, based on household size and dwelling in 2020. We calculate interest expenses based on the size of household debt at year-end. We find that most households in 2020 were well positioned to cover normal expenses and interest, but that a small group, mainly with low incomes, did not have sufficient income to cover these expenses. We show which groups may be vulnerable if normal expenses were to increase more than income, and if interest rates were to rise.

Income deficit is not a sufficient condition for a lack of debt-servicing capacity. Low-income households may have other assets they can draw on for a period to cover deficits. On the basis of gross financial wealth, we define a measure of disposable financial wealth. We also identify mortgage-free housing wealth that households can use to increase their mortgages within the LTV ratio requirement in the regulation on requirements for new residential mortgage loans. This provides a limit for how much of the wealth a household can use to cover a liquidity deficit.

The analysis is static, and households' income, financial wealth, housing and size are held constant. We do not take into account that financially stressed households can change homes and try to supplement their income by working more. Some households may also receive support from family. The calculated normal cost of living is intended to represent a fixed basic consumption, but in a real-world context, some of these cost items may be adjusted. We also assume that the composition of consumption does not change, even if the price of some goods should rise more than others. For individual households, normal expenses may deviate from the estimates here. The analysis is not suitable for assessing the challenges facing a particular household, but for groups of households we can assume that the results are more robust.

We assume that the relationship between income and debt remains constant when we change the interest rate, even though wage growth is often high when interest rates are high. In periods of high interest rates and high wage growth, households can adjust debt and wealth over time. On the other hand, periods of stress in the

form of unemployment and falling house prices can make change difficult. The effects we bring to light should be interpreted as extreme outcomes in the event of sudden, unexpected shocks to expenditure and interest rates. The intention is to shed light on how large groups will have to make changes to their behaviour in the event of different types of cost shocks. We should add, however, that households are likely to adjust their consumption and savings path in the event of higher interest rates or declining real income even before their debt servicing capacity is threatened. This adjustment may affect the macroeconomy.

This study builds on almost 20 years of analyses of microdata on households at Norges Bank. The first study on households' financial margins was published in Economic Bulletin back in 2006. [Vatne \(2006\)](#)) found that households' total financial margins increased sharply from the end of the 1980s to 2004. The reason was strong income growth at the same time as a reduced share of income went to ordinary living expenses and debt servicing. [Lindquist et al. \(2014\)](#) summarised the work on microdata up to 2014. They find that the distribution of debt across age groups has changed over time, with increased debt among older households and less among younger households. [Solheim and Vatne \(2013\)](#) finds that the default rate on loans to households from Norwegian banks and mortgage companies fell after the banking crisis in the 1990s and remained low after the turn of the millennium. They establish a framework where households face credit risk at the same time as they are faced with high debt, low debt-servicing capacity and weak collateral. Even though the debt-to-income ratio has risen to historically high levels, the share of debt held by households with low debt-servicing capacity and weak collateral has fallen since the beginning of the 1990s. However, the size of the vulnerable group will be sensitive to shocks, such as higher interest rates, lower purchasing power or a fall in house prices.

## 2. Information about households – sample delimitation

We put together information from several different registers.<sup>2</sup> The income and wealth statistics for households, based on tax returns, contain information on the size of households, the age of the main income earner, income, wealth and debt. From the Norwegian Mapping Authority's land registry and cadastre, we can find, among other things, the type of dwelling and the size of the dwelling.

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<sup>2</sup>We use pseudonymised data, ie data where, among other things, the social security number has been replaced with a serial number. We do not focus on individual households but use the data to construct relevant aggregates.

**Tabell 1:** The sample of households in the analysis

	Number (1000)	Debt (Bn.)	After-tax income (Bn.)	Financial wealth (Bn.)
All	2 512	3 724	1 562	3 344
Homeowners, age 20-90 <sup>1)</sup>	1 698	3 283	1 097	2 669
After truncation <sup>2)</sup>	1 652	3 098	1 019	1 520
Reduction in % of homeowners	2.68	5.64	7.17	43.06

1) Those below 20 years or above 90 years are excluded.

2) Those with 1% highest and lowest income and 1% highest financial wealth are excluded.

We focus on the ability to service households' existing debt. Most household debt is linked to mortgages on dwellings. We therefore limit our sample to home-owning households. We exclude households where the main income earner is under the age of 20 or over the age of 90, as many of the homeowners in these groups have income, debt and wealth ratios that significantly differ from the average household. This leaves us with about 1.7 million households, which account for almost 70 percent of households in the income statistics, see Table 1. These households hold slightly less than 90 percent of total household debt and account for about 70 percent of households' total after-tax income.

Households with very low income in the income statistics may, for example, receive social security benefits or may have low income due to tax planning. This makes the group very heterogeneous. We therefore exclude households with the 1 percent lowest income. Households with high incomes or substantial financial wealth often have considerable flexibility in their financial adjustment. A static analysis is therefore less relevant for that group, and we also choose to exclude households with the 1 percent highest income and those with the 1 percent highest financial wealth. In addition, This reduces the sample further by about 45 000 households.

Our sample therefore comprises about 65 percent of households, which hold 82 percent of household debt, just over 60 percent of household income and a little less than 40 percent of household gross financial wealth. The low share of gross financial wealth largely reflects the skewed distribution of ownership of securities, particularly unlisted equity.

We divide the sample into five equally sized groups (income quintiles) by after-tax income, but before the tax deduction for interest expenses. Each group includes just

over 330 000 households. The lowest income group has an after-tax income of between NOK 148 000 and NOK 322 000 (see Table 2). The highest household income in our sample is about NOK 2 100 000. As expected, those with the highest incomes also on average have the most debt, the most expensive housing and the highest financial wealth.

**Tabell 2:** Income groups (income quintiles) and their characteristics. NOK 1000

Income group	After-tax income			Average		
	Min	Max	Average	Debt	Retail Value	Financial Wealth
1	148	322	264	629	2959	595
2	322	445	381	1190	3271	626
3	445	625	526	1655	3733	796
4	625	891	755	2334	4328	963
5	891	2100	1153	3568	6008	1619

### 3. Households' normal expenses

The Consumer Institute SIFO at OsloMet prepares a reference budget ([SIFO \(2022\)](#)) for what a household needs for food, clothing, transport, etc. The reference budget is used when banks assess the mortgage size a loan applicant can obtain. The reference budget shows the cost of a consumption level that does not particularly stand out, but the budget is perceived as quite restrictive<sup>3</sup>. We use a reference budget that also includes cars. This means that we might overestimate normal expenses somewhat for some small households in the largest cities. The reference budget incorporates economies of scale when there are more persons in the household. When calculating normal expences, we have information about the number of household members, but not their age and gender.

SIFO's reference budget does not include costs for housing, neither rent or nor ownership. A homeowner has varioud fixed expenses, including indirect taxes and insurance. Moreover, a majority of Norwegian municipalities have introduced property tax. The Norwegian Home Owners Association, in collaboration with Economics Norway, publishes annually a housing cost index with estimates of expenses for a dwelling of 120 square meters at the municipal level ([Huseierne \(2020\)](#)). We use the housing cost index to estimate expenditure on insurance and local government taxes

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<sup>3</sup>The reference budget is used, among other things, as a basis for calculating subsistence expenses for households entering into a debt settlement

but adjust for dwelling size and type of dwelling when known. When the size of the dwelling is unknown, we assume a dwelling of 120 sqm.

For property tax, we use the figures per municipality published by Statistics Norway ([Statistics Norway \(2022\)](#)). We use the assessed value stated in the income statistics for assessing property tax. When a household owns several dwellings, we apply the property tax in the municipality where the household has its primary address.

Electricity costs represent a significant cost for homeowners. Average energy consumption per square metre – adjusted for household size<sup>4</sup> – is based on figures from Statistics Norway ([Statistics Norway \(2022a\)](#)), but with lower energy consumption if the home is an apartment. Fixed costs are based on information from the Norwegian Water Resources and Energy Directorate (NVE) and the Norwegian Home Owners Association. We take into account the differentiation of VAT and electricity tax across municipalities. Our calculations for 2020 include an average variable electricity price of NOK 0.38 per kWh. This is in line with an average for households' electricity price before VAT in the period 2012-2021 but is higher than the actual electricity price in 2020, which was 19 øre. For 2020, we assume the same variable electricity price across the country.

We assume that electricity consumption remains constant even if the price rises. In practice, many households will be able to subsidise between different forms of energy and cut electricity consumption somewhat when prices increase. Over time, households will be able to invest in energy-saving measures. However, we do not have a solid basis for determining the price elasticity of household electricity consumption.

Note that the sum of indirect taxes, property taxes and electricity does not reflect an implicit housing rental price. Estimated expenses reflect the current costs the household must cover in order for the dwelling they own to be used.

We have assumed that all borrowers pay the same interest rate, and that the level of tax-deductible interest expenditure is 22 percent. The average interest rate in 2020 was 2.3 percent. We do not distinguish between housing debt, student debt and consumer debt. For homeowners, most of the debt is secured on dwellings. In practice, there will be differences in interest rates between different groups, but the differences in interest rates across mortgages with collateral for households with a normal payment history are relatively small. The same interest rate makes it easier

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<sup>4</sup>The figures are based on the 2012 Consumer Survey. For households living in apartments, electricity consumption is reduced by 25 percent per square metre.

to compare the effects of interest rate increases across groups.

We concentrate on normal expenses and interest because they are the most critical in a short-term period of financial stress. Over time, this is not a sufficient measure for total annual expenditures. Maintenance is necessary to maintain the property's value over time. In addition, households with unsecured loans or loans with an LTV ratio of more than 60 percent will normally have to pay instalments at least the equivalent of a 30-year repayment period. In a period of financial stress, we assume that the household can defer such expenses.

Food and other necessary consumption, such as clothing and transport, are the largest expenditure items relative to after-tax income. Expenditure on food, as a share of income, corresponds approximately to what was reported in the 2012 Consumer Survey.<sup>5</sup> All items in normal expenses account for a larger share of after-tax income for the lowest income groups, also when taking into account differences in housing and household size. Interest expenses, on the other hand, account for about the same share of income across all income groups, reflecting that those with the highest income have the most debt, see Table 3.

**Tabell 3:** Normal expenses and interest as a share of after-tax income (before interest deduction). Average. Percent

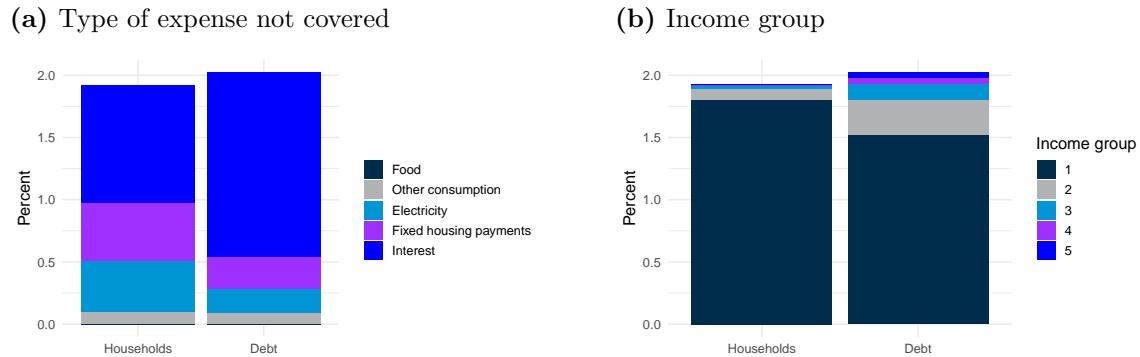
Income-group	Food	Other con-sumption	Fixed housing-payments	Electricity	Interest	Free income
1	14.9	43.3	9.1	4.7	5.5	22.4
2	10.6	30.3	6.5	3.3	7.2	42.1
3	9.4	24.1	5.1	2.6	7.3	51.5
4	9.1	19.8	4.2	2.1	7.2	57.6
5	6.6	13.7	3.3	1.6	7.2	67.6
All	8.9	21.6	4.7	2.4	7.1	55.4

Table 3 shows that those with low incomes are particularly vulnerable to higher normal expenses, while higher interest rates also affect those with high incomes to a greater extent. An increase in interest rates will cost slightly more as a share of total

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<sup>5</sup>See Consumer Survey ([Statistics Norway \(2013\)](#)) for consumption figures and Household Income Statistics ([Statistics Norway \(2022b\)](#)) for after-tax income figures. We have slightly higher estimates of electricity costs than Statistics Norway ([Halvorsen \(2022\)](#)), which finds that the lowest income decile in the winter of 2020-21 in South Norway spent about 3.2 percent of disposable income on electricity, while the highest income decile spent 0.7 percent.

**Figure 1:** Proportion that does not have income to cover normal expenses for subsistence and interest



income for those with the highest incomes than for those with the lowest incomes because those with the highest incomes have more debt relative to income. However, those with the highest incomes have the highest “free income” after normal expenses and interest. The highest income group has on average over three times more of such income, and thus has much greater flexibility to cover increased expenses of all kinds, including increased interest expenses. A one percentage point increase in interest rates reduces such income for the lowest income group by almost 11 percent, while it reduces it by just over 4.5 percent for the highest income group.

To illustrate the household’s ability to cover different expenses, we sort them by which expenses we assume are prioritized first. All households in the sample have enough income in 2020 to cover expenses for food, hence there is no visible box for food in figure 1. About 3.5 percent of households cannot afford to cover the sum of what we define as normal expenses and interest, given the dwelling they owned in 2020. These hold about 3 percent of total debt in the sample. A majority of households that could not cover their expenses were in the lowest income group, but much of the debt lies with the relatively few households with income deficits that are in higher income groups.

#### 4. Financial buffers

A household that has savings or access to credit can weather periods where costs exceed income. Some households may choose to have low income for a period, for example because they take a year off from working life or work less during the toddler phase. Pensioners may choose to remain in a large dwelling or have a lot of debt,

which they service by drawing on savings.

Gross financial wealth consists of bank deposits, funds and equities. Deposits are normally highly liquid, funds and listed equities have varying liquidity ratios. Unlisted equity can be difficult to realise. The income statistics are not sufficient to provide a good delimitation of what can be used for current expenditure or not. We make the simplifying assumption that a share of the entire gross financial wealth is disposable.

We make two delimitations of financial wealth to find what is available to cover normal expenses and interest. First, we deduct two monthly salaries. Deposits in the income statistics include parts of a monthly salary that will cover expected consumption up to the next payday. Hence, these are not savings. Households must also have a minimum of liquid assets to cover unforeseen expenses. Furthermore, we assume that households can only use 20 percent of their remaining financial wealth to cover a liquidity deficit per year. This assumption reflects the condition that we allow financial wealth to cover a deficit that may persist over a period of time. Financial wealth is unevenly distributed across households, but older persons generally have greater disposable financial wealth than younger ones, see Chart 2.

In addition, many households have housing wealth. In principle, housing wealth is not liquid, but can be used as collateral. We assume that if the debt amounts to less than 60 percent of the estimated value of the dwelling, the household can increase its leverage.<sup>6</sup> We allow debt to increase by 20 percent of the available collateral value up to the 60 percent limit. This is "free housing wealth", and households over the age of 50 in particular have a high level of this wealth. This group has both repaid debt and benefited from higher house prices as a result of a long presence in the housing market. For older households, free housing wealth is on average greater than disposable financial wealth.

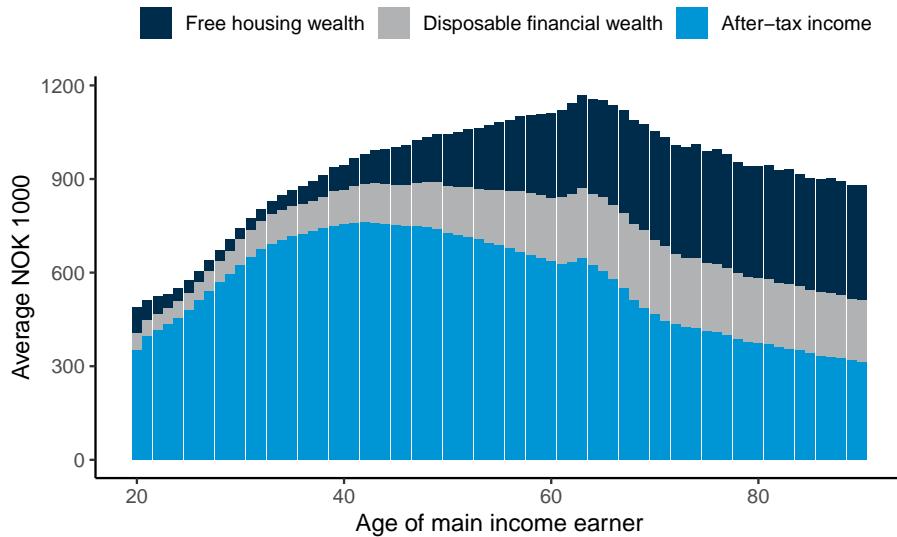
Whether banks will actually extend lending limits to households with payment problems is of course uncertain. However, in a situation with temporary macroeconomic stress while the collateral for the loan is considered to be solid, banks may have strong incentives to, for example, allow interest rates to accrue to the loan instead of imposing a payment solution.

Only a small share of households do not have sufficient income or wealth to cover normal expenses and interest, see Chart 3. The majority of households have sufficient

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<sup>6</sup>An LTV ratio of 60 percent is the limit in the lending regulations for when the bank can provide loans secured on dwellings without requiring instalments.

**Figur 2:** Free housing wealth, disposable financial wealth and after-tax income



income. There is a concentration of households with a liquidity surplus of almost 60 percent of after-tax income. This applies both when we only include income and when we include both income and wealth. When wealth is taken into account, there are large groups that have substantial liquidity surpluses.

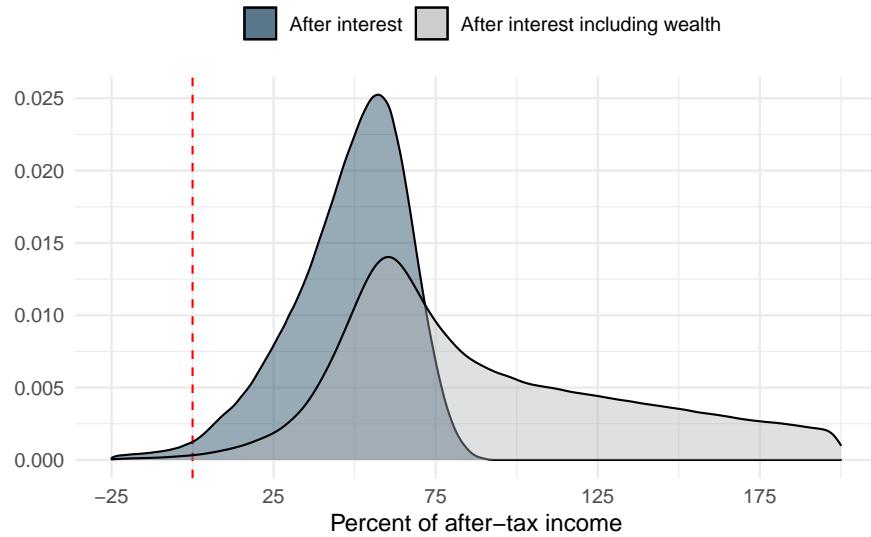
## 5. Households' debt-servicing capacity in 2020

Weak debt-servicing capacity is defined as a household not having sufficient income, disposable financial wealth or free housing wealth to cover normal expenses and interest. In this case, it is difficult to avoid default and the bank may be better served by the household moving into a debt settlement.

Less than 2 percent of households did not have sufficient income to cover normal expenses and interest (Chart 4). They held about 2 percent of the debt. Taking into account disposable financial wealth and free housing wealth, the share of households with weak debt-servicing capacity is reduced to just under 0.5 percent. They held slightly less than 0.9 percent of the debt in our sample.

The largest group of homeowners with weak debt-servicing capacity had a main income earner of around 30 years, see Chart 5. At the same time, we see that as households approach the age of 60, the number of households with problems declines markedly.

**Figure 3:** Distribution of households by liquidity surplus (income with and without wealth less normal expenses and interest) as a share of after-tax income



## 6. Interest rate sensitivity

Given the high level of debt in many households, higher interest rates have a considerable impact on total expenditure. With higher interest rates, the share of households that cannot cover normal expenses and interest also increases markedly in the upper income groups (Chart 6). When interest rates rise above 5 percent, more households in income group 2 experience problems.<sup>7</sup> In income group 3, there are signs that more people will experience problems when interest rates approach 8 percent. If the interest rate were to rise to 10 percent, more households in higher income groups may also experience problems servicing debt. Since these groups have higher debt, the share of debt that may be subject to default increases markedly.

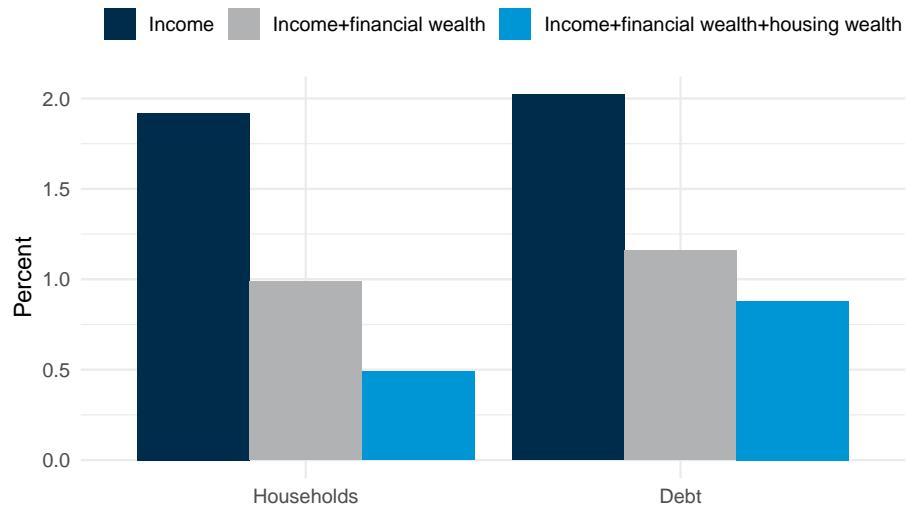
## 7. Electricity price sensitivity

In 2020, electricity was a moderate expense item in the household budget (see Table 3). In 2022, electricity has been sold at up to NOK 10 per kWh. According to

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<sup>7</sup>Note that Norges Bank has estimated a normal real interest rate of around 0 percent. If Norges Bank reaches its inflation target of 2 percent, this would imply a key policy rate of about 2 percent and a residential mortgage rate of between 3.5 and 4 percent. At such interest rates, the share of households that cannot cover normal expenses and interest on their debt is at a moderate level.

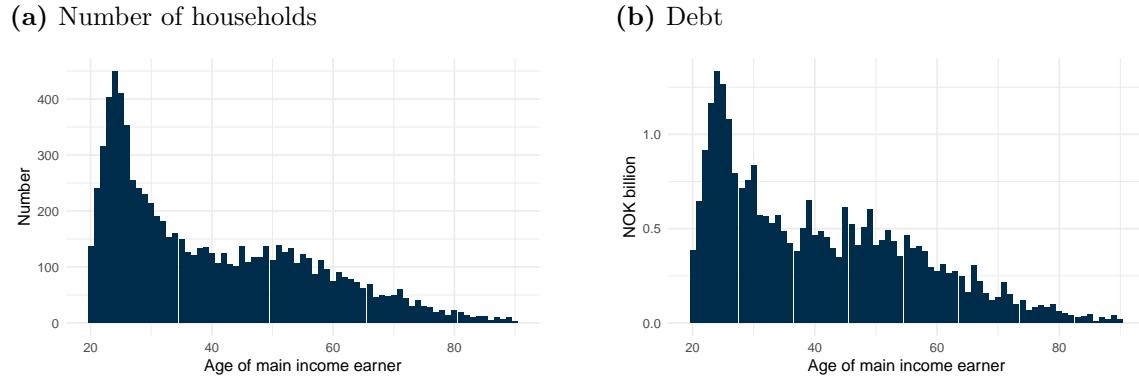
**Figur 4:** Proportion of households that cannot cover normal expenses and interest in 2020, and their share of debt, by use of income, liquid financial wealth and free housing wealth, respectively



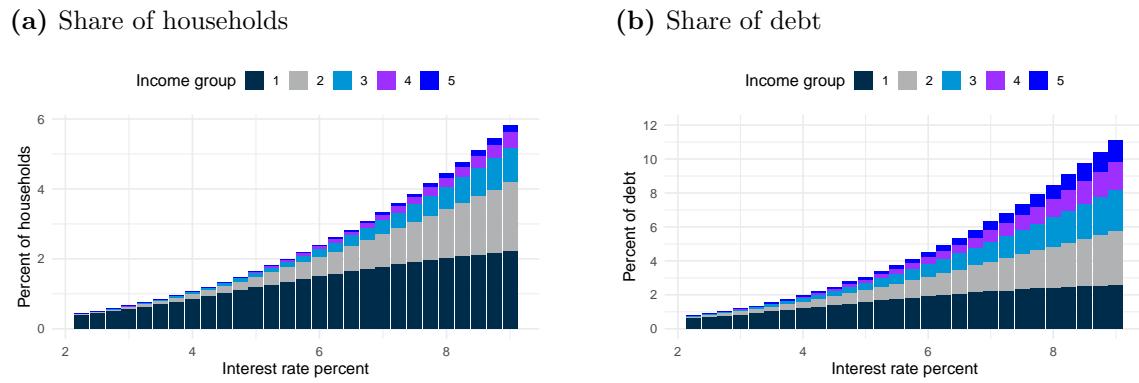
Statistics Norway, the average price in the second quarter of 2022 was 124 øre before VAT, more than 3 times the average price of electricity in the period 2012-2021. This covers major differences between different electricity zones. According to NorgesEnergi, the average price in southern electricity zones in September 2022 was 448 øre ([NorgesEnergi \(2022\)](#)). The effect is mitigated by the government's introduction of electricity subsidies for electricity consumption in primary residences. From September, the government covers 90 percent of the variable electricity price above 70 øre, given that total consumption is below 5000 kWh per month.

We hold the other factors constant and change the variable electricity price for a given electricity consumption. With annual electricity prices on a par with that prevailing in September 2022, but with electricity subsidies, the share of households with weak debt-servicing capacity increases from just above 0.5 to 0.8 percent (see Chart 7). This is an increase of close to 50 percent and concerns about 8 000 households. Without electricity subsidies, households facing difficulties could have increased to around 3 percent, see Chart 7c. This would have been a sixfold increase, with about 32 000 new households facing difficulties. High electricity prices affect not only the lowest

**Figur 5:** Households that cannot cover normal expenses and interest with income and wealth, and their debt. By age of main income earner

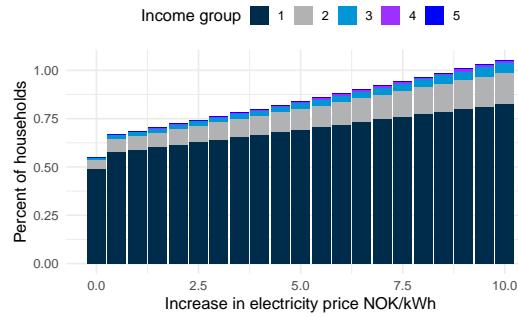


**Figur 6:** Share of households that cannot cover normal expenses and interest with income and wealth, and their share of debt. By income group and interest rate

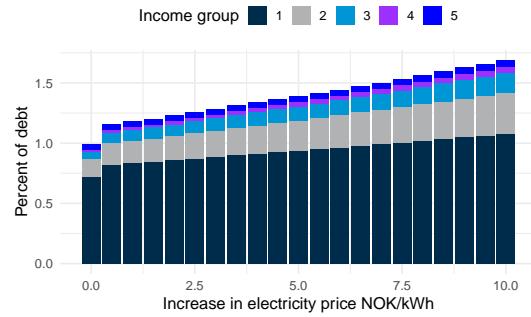


**Figur 7:** Share of households that cannot cover normal expenses and interest with income and wealth, and their share of debt. By income group and electricity price. With and without electricity subsidies. Subsidies kick in when the price is above 70 øre per kWh

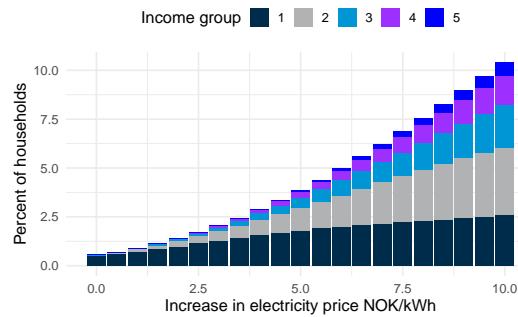
(a) Share of households. With electricity subsidies



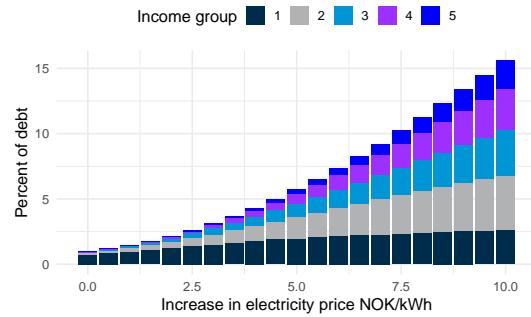
(b) Share of debt. With electricity subsidies



(c) Share of households. Without electricity subsidies



(d) Share of debt. Without electricity subsidies



income group, but also households with large dwellings in higher income groups.<sup>8</sup>

## 8. Consequence of multiple costs increasing simultaneously

Monetary Policy Report 3/2022 ([Norges Bank \(2022\)](#)), projects higher interest rates, higher food prices and increased electricity prices in 2023. At the same time, income growth also increases, and debt growth is estimated to be lower than income growth.

<sup>8</sup>See [Dalen and Halvorsen \(2022\)](#) for a more comprehensive analysis of the economic impact of high electricity prices and electricity subsidies.

It is difficult to transfer growth in income and debt in macro to growth in income and debt in microdata. Historical figures show that developments in these variables are very unevenly distributed in the population. In practice, it is impossible to make a realistic microdata projection of a macro baseline scenario. What we can do, however, is to show how many people that may be at risk of being affected, given the static framework we have set up. This framework does not capture the fact that many people can improve their liquidity in 2023 as a result of a rise in their income – and that some will experience a severe deterioration in liquidity because they experience both a rise in costs and reduced income. The framework is based on and uses the situation and distribution of households in 2020.

We assume that the interest rate will increase from 2.3 percent to 4.3 percent, in combination with an increase in electricity prices of 220 øre for households – but at 90 percent electricity subsidies above 70 øre – and a 10 percent increase in food prices.<sup>9</sup> In practice, the increase in the price of electricity and food has limited impact. However, higher interest rates lay claim to a significantly larger share of after-tax income, causing free income after normal expenses and interest to fall, see Table 4.

**Tabell 4:** Normal expenses and interest as a share of after-tax income (before interest deduction) by combined increase of costs<sup>1)</sup>. Average. Percent

Income-group	Food	Other consumption	Fixed housing-payments	Electricity	Interest	Free income
1	16.4	43.3	9.1	4.9	10.3	16.0
2	11.6	30.3	6.5	3.5	13.4	34.7
3	10.4	24.1	5.1	2.7	13.5	44.2
4	10.0	19.8	4.2	2.2	13.3	50.5
5	7.2	13.7	3.3	1.7	13.3	60.8
All	9.8	21.6	4.7	2.5	13.1	48.4

1) Interest rates increase to 4.3%, electricity prices increase by 220 øre per kWh but electricity subsidies are retained, food prices increase by 10%.

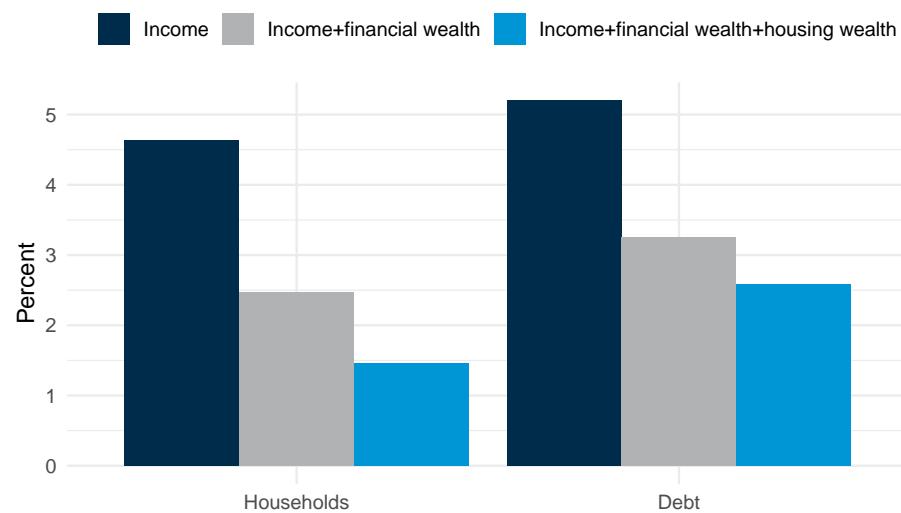
About 4.5 percent of households now lack income to cover normal expenses and interest, and just under 1.5 percent also lack wealth to cover their expenses (Chart 8). They hold 2.6 percent of the debt. This is almost a tripling of the share in 2020,

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<sup>9</sup>Our study is based on the baseline scenario for 2023 in Monetary Policy Report 3/2022 ([Norges Bank \(2022\)](#)).

but still a fairly low figure – particularly in light of the fact that many may have other opportunities to avoid default than we can account for, if there is a pinch. The expectation that revenues will rise is one factor. Many will be able to reduce their electricity consumption or cut other expenses. There is therefore reason to believe that even if the share of vulnerable households increases markedly, the loss rate on household loans will still remain low.

**Figur 8:** Share of households that cannot cover normal expenses and interest, and their share of debt, by use of income, disposable financial wealth and free housing wealth by combined increase of costs<sup>1)</sup>



1) Interest rates increase to 4.3%, electricity prices increase by 220 øre per kWh but electricity subsidies are retained, food prices increase by 10%.

## 9. Household debt-servicing capacity under severe stress

Financial Stability Report 2022 presents a stress test in which the lending rate rises to 9 percent, at the same time as households experience a sharp cost shock and a fall in real income. Simultaneously, nominal house values fall by about 20 percent. The stress test is intended to illustrate economic disturbances that can amplify vulnerabilities in the Norwegian financial system. In this scenario too, as expected, it is primarily high interest rates that reduce households' free income after normal expenses and interest, see Table 5.

**Tabell 5:** Normal expenses and interest as a share of after-tax income (before interest deduction) in the stress test<sup>1)</sup>. Average. Percent

Income-group	Food	Other consumption	Fixed housing-payments	Electricity	Interest	Free income
1	16.4	43.3	8.8	5.1	21.5	4.9
2	11.6	30.3	6.2	3.6	28.1	20.2
3	10.4	24.1	4.9	2.8	28.3	29.5
4	10.0	19.8	4.0	2.3	27.8	36.1
5	7.2	13.7	3.1	1.8	27.9	46.3
All	9.8	21.6	4.5	2.6	27.4	34.1

1) Interest rates increase to 9%, electricity prices increase by 400 øre per kWh but electricity subsidies are retained, food prices increase by 10%, house prices fall by 20%.

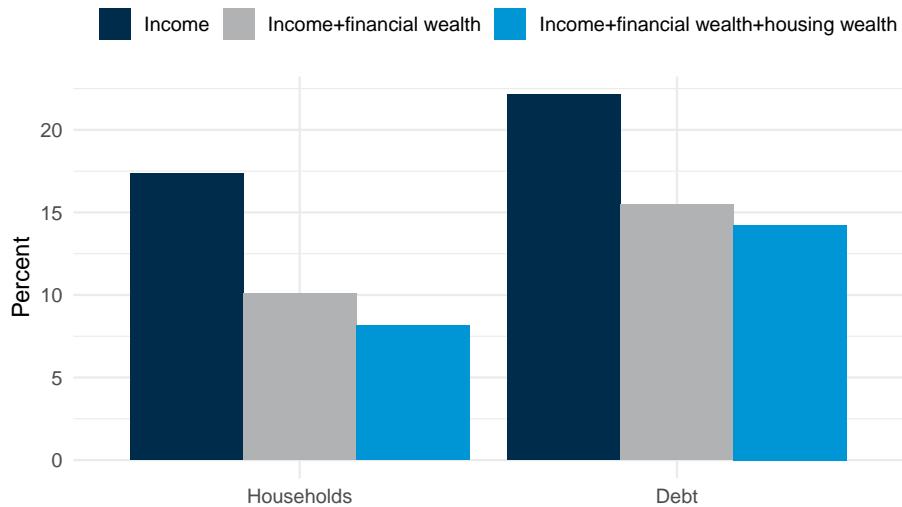
Given the assumptions in the stress test, more than 17 percent of households no longer have income to cover normal expenses and interest, see Chart 9. More than 8 percent of households cannot cover their own interest expenses even after using financial wealth or housing wealth. We have incorporated that borrowing possibilities are reduced when house values fall. Vulnerable households hold more than 14 percent of household debt. It should be noted that this applies to the debt, income and financial wealth of the household at the beginning of the crisis. Groups that are able to service their debt and hold nominal debt steady, while wages grow in nominal terms, may fare better after the crisis.

When we compare with 2020, a path similar to 2023 in the baseline scenario in Monetary Policy Report 3/2022 and a stress test, we see that it is only in the stress test that the increase in the number of vulnerable households becomes pronounced, see Chart 10. With a higher cost level in the "2023 path", our analysis shows that more people will experience payment problems, but the increase is moderate in percentage points, and will involve about 30 000 households. On the other hand, in the stress test the share of vulnerable households becomes more severe, and the number of households that encounter serious problems now exceeds 100 000. They hold a total of about NOK 30 billion in debt.

## 10. Payment problems and probability of loan losses at banks

There is no direct relationship between payment problems as defined in this analysis and the level of bank losses. First, households have other sources of debt servicing,

**Figur 9:** Share of households that cannot cover normal expenses and interest, and their share of debt, by use of income, disposable financial wealth and free housing wealth in the stress test<sup>1)</sup>

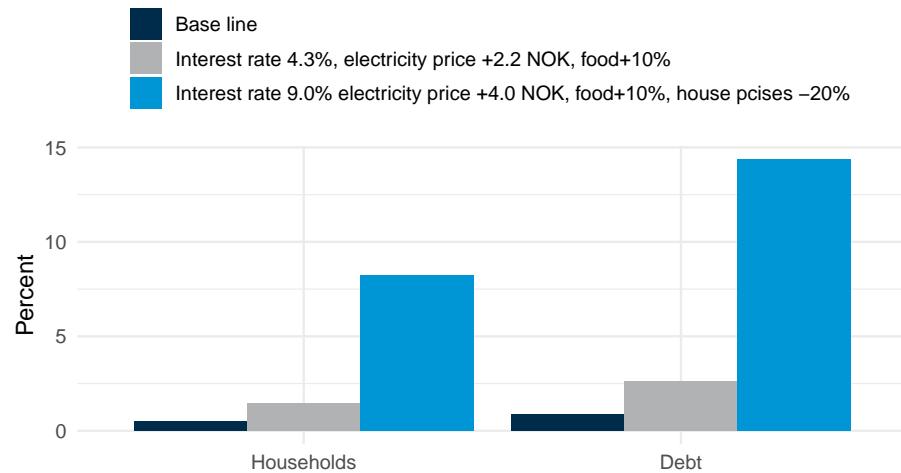


1) Interest rates increase to 9%, electricity prices increase by 400 øre per kWh but electricity subsidies are retained, food prices increase by 10%, house prices fall by 20%.

as mentioned above. Even if households were to default on the entire loan, the bank will still be able to recover much of its outstanding debt through foreclosure of the dwelling provided that the loan-to-value ratio is not too high. Debt normally accompanies you for life, and the bank can therefore cover its losses if households subsequently improve their finances. Even if the number of people with payment problems increases markedly, as we see in the stress test, banks' losses may therefore remain relatively moderate.

At the same time, a larger number of households experiencing payment problems will increase the probability of losses. Banks incurred substantial losses, including on household loans, during the banking crisis at the beginning of the 1990s. At that time, nominal interest rates were very high – up to 14 percent at their highest. The composition of household loans in private banks was also different from today, since the state-owned Norwegian State Housing Bank played a far greater role in financing housing for private individuals than it does now. Some of the projected losses were also recouped in the years following the banking crisis when house prices began to

**Figur 10:** Share of households that cannot cover normal expenses and their share of debt, after using income, disposable financial wealth and free housing wealth, respectively. Three outcomes



rise again and interest rates fell.

It is difficult to estimate a correlation between payment problems and bank losses with our data. Since the mid-1990s, losses on residential mortgage loans have been low. At the same time, debt-servicing capacity has gradually improved, despite rising debt levels. Mortgage rates have tended to fall, and households' normal expenses before interest have fallen, not least because of a decline in import prices. The calculations we make here cannot be traced back more than a few years in time.<sup>10</sup> It is therefore difficult to affirm a robust relationship between the number of persons in the group with debt-servicing difficulties as defined here and expectations of banks' losses.

## 11. Summary and assessments of implications for financial stability

Using information at household level, we have calculated the ability of Norwegian homeowners to service their debt with available income and wealth given interest

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<sup>10</sup>The income statistics cover debt and income for all households back to 2004 but have sound assessments of housing values only from 2010.

rates, living expenses and housing costs. This helps us identify households that cannot cover normal expenses and interest. We show how this group is distributed by income and age. Calculations using the 2020 figures show that 99.5 percent of the households in our sample were able to cover normal expenses and interest.

Higher interest rates will reduce debt-servicing capacity, but the vast majority of households have sufficient income to withstand a moderate rise in interest rates. Given the debt-to-income ratio in 2020, it is only when interest rates rise above 5 percent that a larger share of households in the second lowest income group experience increased problems paying normal expenses and interest, and only when interest rates reach 8 percent do we see an increase in the share among those in higher income groups. Higher interest rates then affect the finances of a large number of people with substantial debt.

Households are also vulnerable to other cost factors, such as higher electricity prices. Without the electricity subsidy, many people would have had to make major adjustments if they were to have managed to maintain their debt-servicing capacity.

In a stressed situation, with a combination of reduced purchasing power and an interest rate of 9 percent, up to 15 percent of household debt may be for households that have problems covering their normal subsistence and interest expenses. The stress test is intended to shed light on the robustness of a possible – but unlikely – macroeconomic situation.

Our analysis is static, which means that the results must be interpreted with caution. Periods with high interest rates are often periods with rising wages. Moreover, over time households may adjust by choosing a smaller dwelling and lower debt level. Our calculations of the number of households that may encounter problems are therefore probably too high. Future work will focus on possible distributional effects and a more detailed description of which groups are most vulnerable to cost shocks. In order to obtain a complete overview of household welfare developments, a broader definition of costs than used in this analysis must be applied.

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