

Financial margins in Norwegian households - An analysis of micro data for the period 1987-2003

Bjørn H Vatne¹

Financial margins are defined as households' liquid assets after borrowing costs and ordinary living expenses. This is an indicator of how robust the debt situation in a household is to a change in economic conditions such as an increase in interest rates or lower income. Thus, financial margins can give information concerning the risk of default on bank loans to the household sector. In this article, financial margins are calculated using micro data for the period 1987-2003.

Norwegian households' financial margins have increased substantially from the end of the 1980s to 2003. The reason for this is strong growth in household income, at the same time as a lower share of income was used to cover living expenses and loan-related expenses. Most households have comfortable margins, but some households have small or negative margins. The share of households without financial margins has decreased over the period analysed.

1. Introduction

In evaluating the risk connected with loans from financial institutions, it is important to monitor the debt situation in the household sector for two reasons. First, a widespread failure in households' ability to service debt obligations will cause increased losses on financial institutions' loans to the household sector. Second, households in financial distress are likely to reduce their demand for goods and services. This will in turn affect the profits of firms, which may result in increased losses on bank loans to the commercial sector.

The financial margin of a household, defined as liquid assets after ordinary costs of living and interest and principle payments, can be used to shed light on both these subjects. Micro data is used to calculate the financial margins of individual households. The margins can be used in two ways. In the first part of the analysis, the sum of positive margins across households, depreciated by the consumer price index, is interpreted as the total funds available in the household sector, i.e. the total amount that may be used for consumption other than common costs of living and saving other than loan instalments. In the second part of the analysis, financial margins are used to assess how exposed household debt is to unexpected shocks. We estimate the proportion of total households without financial margins and their corresponding share of total debt. Further, we analyse which groups of households have no margins, and how the situation has evolved over the analysis period 1987-2003. Finally, we estimate the effect of an increase in the interest rate on the financial margins.

¹ Senior Advisor, Financial Stability, Central Bank of Norway, Bjørn-Helge.Vatne@Norges-Bank.no. Thanks to Snorre Evjen and Birger Vikøren for valuable comments. Thanks to Jon Epland, Vidar Pedersen and Grethe Sparby from Statistics Norway for help in building up the data set.

2. Background

Why study financial margins?

Norges Bank monitors the debt situation in the household sector as a part of the surveillance of risk in financial markets. In macro studies, it is common to use total household debt as a percentage of total disposable income as an indicator of how exposed the debt of the households is to unforeseen shocks (see, for example, Chart 2.12 in Norges Bank (2006)). However, this aggregated indicator has some shortcomings. First, the income also includes income from households without debt. Second, the indicator does not take the level of income into account. Households with high income can service relatively more debt than low-income households. Third, the indicator does not reflect fundamental differences between households such as age, number of persons in the household and affiliation with the labour market.

Access to micro data allows us to calculate financial margins that reflect the financial situation in each household more precisely. The calculation of financial margins has much in common with the assessments made by Norwegian banks when they consider household loan applications. Banks base their assessments on household income. Ordinary costs of living based on the characteristics of the household are deducted. From the resulting disposable income, a maximum loan is calculated based on assumptions concerning interest rate and profile of instalments. However, there is uncertainty surrounding these calculations. Interest and instalments shall be paid over the total life of the loan. Income, costs of living and interest rates may change, affecting the household's ability to service the loan.

From the calculated margins we can identify households without financial margins. We assume that these households' financial situation is strained and that their debt is especially exposed to default. The exposed debt as a fraction of total debt is an indicator of the direct risk associated with bank loans to households. Total margins, defined as the sum of the margins in households with positive margins may be an indicator of the total demand from the commercial sector. Total demand will affect firms' income and ability to service debt.

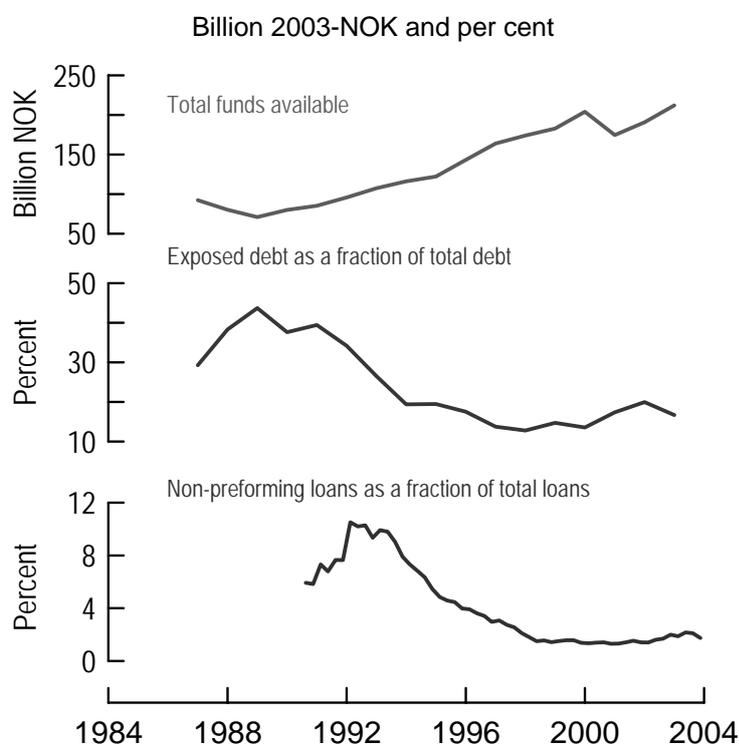
Our hypothesis is that developments in the financial margins of households affect developments in risk associated with bank loans. The data does not have enough observations to perform a proper statistical test of this hypothesis. However, in Chart 1 we have shown this correlation graphically. The bottom graph shows the rate of default on bank loans defined as the value of defaulted loans to households and non-financial companies as a fraction of the total value of all loans. The chart indicates that there is a positive correlation between the rate of default and the financial margins of the households. There is a positive correlation between the default rates and the share of debt held by households with negative margins (exposed debt). The turning points of exposed debt seem to precede the turning points of default rates. A possible explanation is that households have financial assets that they can use before they default on their loans. There is a negative correlation between the total funds available to households and the default rate.

In addition, the micro data give us the possibility to analyse the distribution of financial margins over groups of households. By identifying which groups of households are most exposed we can identify causes of increased default risk at an early stage.

Other countries have conducted several micro-based studies of the debt situation of the household sector (see DWP (2004) and May et al. (2004)). The analyses in these papers are in line with the work done by Sveriges Riksbank (2004, 2005) and BIS (2006). In this analysis, households are divided into five equal sized groups according to income, and their debt and financial margins are evaluated. The main conclusion is that the high level of debt in the household sector does not pose a major threat to banks. This is because the loans in Sweden are concentrated among high income groups. These groups also have the highest margins and most of the financial assets. We roughly compare our findings with these results.

Chart 1

Development in total fund available, exposed debt and banks' non-performing loans



Source: Statistics Norway, SIFO and Norges Bank.

Data

The micro data used in this paper are from the Income and Property Statistics for Households 1987-2003 gathered by Statistics Norway (see NOS D310 (2004)). The data provide information on households' average income, income composition and distribution, and similar information about property. The statistics are based on material from the Income Distribution Survey, which is a representative sample survey. The information is based on tax returns for all household members and additional information on tax-free income from a number of public registers. There is reason to believe that households tend to under report figures that are taxable and over report data that result in tax-deductions.

The households in this analysis are limited to households where salary is the main source of income, "Employees". Self-employed households, where the net entrepreneurial income exceeds salary is excluded from the data set. In these households, we cannot isolate the household economy from the economy of the firm. Pensioners and insurance recipients have an income below the standard social benefits. These households are also excluded from the dataset. Students are mainly included in this group. Student loans are reported as debt, but are mainly used to cover living expenses.

60 per cent of the observations are employees. In the beginning of the period, there are roughly 2 200 observations of employees. At the end of the period, there are 10 000 observations. Due to the lower number of observations at the beginning of the period, there is more uncertainty connected to the estimates of the earlier years.

The data include, in addition to economic data, information about the characteristics of each household, such as age and the number of persons in the household. Based on this

information, we can calculate common living expenses from the Standard Budget developed by National Institute for Consumer Research (SIFO (1987-2003)). The judgement of what is a necessary level of consumption will vary from household to household, and with geographic location.

The tax returns data include information on paid interest, but not on instalments. Instalments are calculated by assuming linear repayment over 20 years. It is possible to negotiate a longer period of repayment and annuity loans or exemption from repayment.

The economic setting

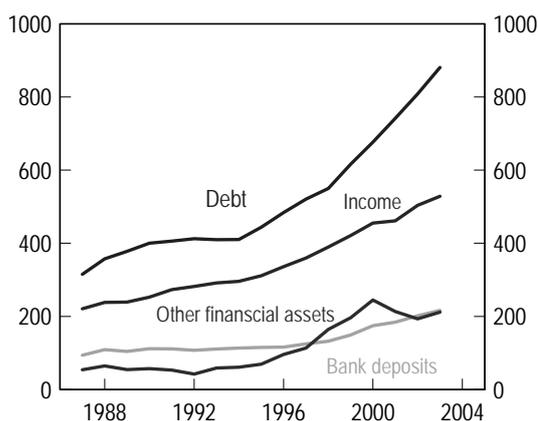
The fundamental economic variables of this analysis are income after tax, debt, bank deposits and other financial assets. Developments in these variables in fixed prices are shown in Chart 2. Total household debt has increased by about 80 per cent in the period 1987-2003. Income has shown a weaker development. The average interest rate on loans to households has decreased by ten percentage points over the period. In 2003, the interest rate was around 6 per cent (see Chart 3). See Norges Bank (2006) and Riiser and Vatne (2006) for a general description of the financial situation in the household sector.

In this analysis, financial assets are divided in two components, bank deposits and other financial assets. In 2003, roughly half of the total financial assets were deposits. Growth in deposits has been weaker than growth in total debt. Thus, debt is secured in deposits to a lesser degree in 2003 than in 1987. The tax value of other financial assets has grown rapidly and faster than debt in the period. Of other financial assets, 60 per cent represents unlisted securities and other outstanding claims. This portion of financial assets is more sensitive to market fluctuations and is less liquid than deposits. Thus, the extent to which these assets can serve as a buffer when households face debt-servicing problems is uncertain.

Chart 2

Total value of debt, income and financial assets

Billion 2003-NOK. Employed. 1987-2003

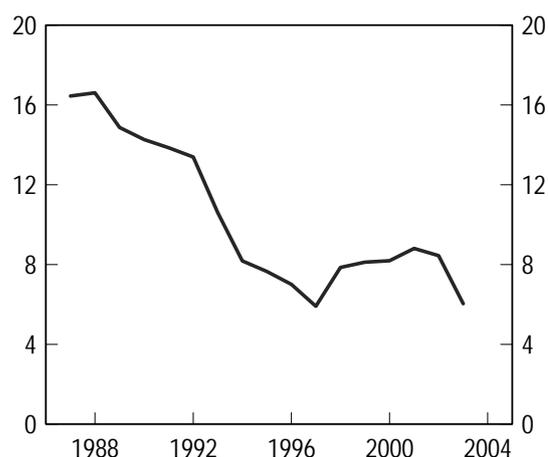


Source: Statistics Norway and Norges Bank.

Chart 3

Banks average interest on loans

Per cent. 1987-2003



Source: Norges Bank.

Financial margin - definitions

In Table 1, the different types of margins that are used in this analysis are defined on the basis of the components that are included. Margin after consumption is defined as income after tax less common living expenses. We get margin after interest if we in addition deduct paid interest. Margin after instalment, which is the benchmark, includes repayments. In the two last definitions, bank deposits and other financial assets can be used to cover the expenses of the households.

Table 1
Financial margins
Average. NOK 1000. 2003

		Income after tax	Bank deposits	Other financial assets	Ordinary living expenses	Interest paid	Down payments
Margin	Average NOK 1000	425	174	170	182	43	35
Margin after consumption		+			-		
Margin after interest		+			-	-	
Margin after instalment		+			-	-	-
Margin with bank deposits		+	+		-	-	-
Margin with financial assets		+	+	+	-	-	-

Source: Statistics Norway, SIFO and Norges Bank.

3. Household financial margins

Total household margins have increased over the period analysed

In Chart 4, total household income after tax is decomposed after costs and margin after instalments. The numbers are deflated by the consumer price index to reflect the development in purchasing power. In 1987, the margin after instalments was 24 per cent of income. In 2003, this ratio rose to 39 per cent. The reason for this is that total household income has increased by 53 per cent in the period. The share of income used for normal living costs is reduced from 51 to 43 per cent. The cost related to debt is reduced from 25 to 18 per cent. Total household purchasing power increased from 83 to 205 billion 2003-NOK.

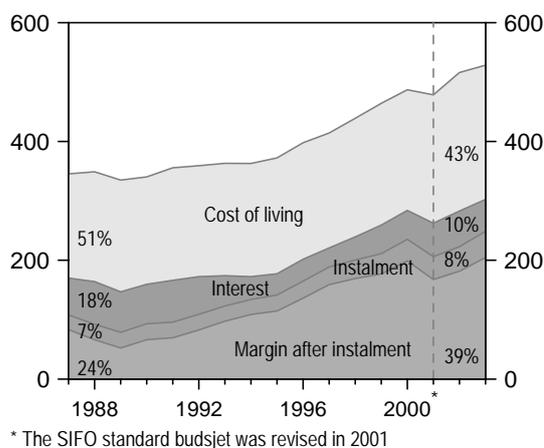
Chart 5 shows developments in the total funds available to households when we include financial assets. If we include all financial assets, total funds available have doubled. Financial assets' contribution total funds available were reduced from 74 to 68 per cent. In 1987, half of the available funds were bank deposits, and other financial assets represented about one-fourth. In 2003, bank deposits and other financial assets both amounted to about one-third. In other words, the share of bank deposits has fallen while the shares of less liquid and more volatile assets have increased.

The distribution of financial margins across households

In general, the financial situation of Norwegian households is solid. In 2003, more than half of the households had a margin after instalments of more than NOK 100 000 (see Chart 6). 16 per cent of the households had a margin between 0 and NOK 50 000, while 13 per cent of the households had no margin. The debt of households without margins is especially exposed to increases in interest rates and reduction in income.

Chart 4

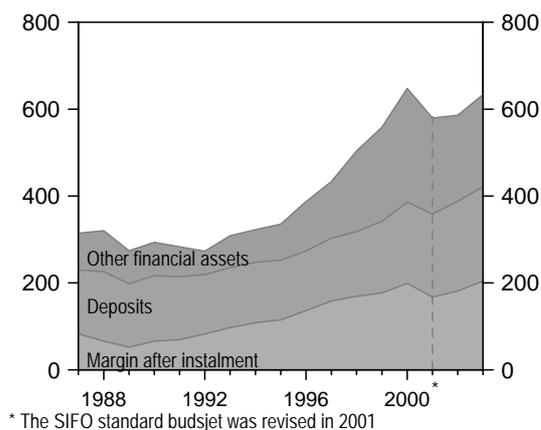
Income after cost and margin
Billion 2003 NOK. Per cent of income.
1987-2003



Source: Statistics Norway, SIFO and Norges Bank.

Chart 5

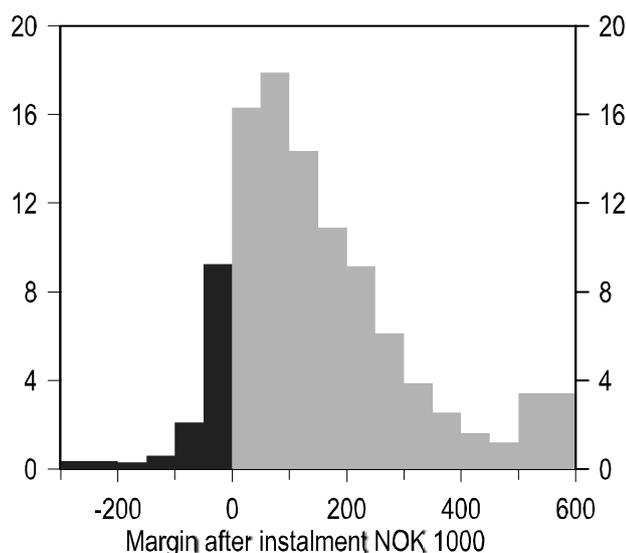
Total funds available included financial assets
Billion 2003-NOK. 1987-2003



Source: Statistics Norway, SIFO and Norges Bank.

Chart 6

Households over margin after instalment
Per cent. 2003



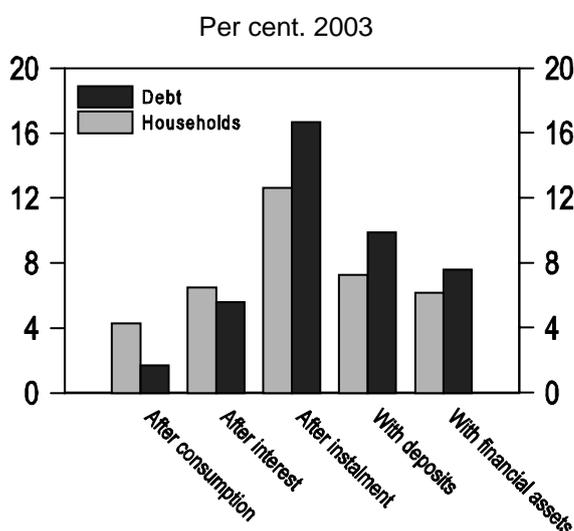
Source: Statistics Norway, SIFO and Norges Bank.

4. Debt held by households without financial margins

One-sixth of total debt was held by households without margins after instalments

The size of the financial margin is an indicator of how robust households are to unforeseen negative events in income or costs. Chart 7 shows the percentage of households without financial margins under the various definitions of financial margins, and the share of total debt that these households held in 2003. Less than 2 per cent of a total debt of about NOK 900 billion is held by households that do not have enough income to cover living expenses. The share increases to 6 per cent if interest is included. Households without margins after instalments held 17 per cent of total debt. If we include financial assets in the liquid assets of households, the share of debt held by households with negative margins is reduced substantially.

Chart 7
Percentage of households without margins
and corresponding shares total debt



Source: Statistics Norway, SIFO and Norges Bank.

In the rest of this paper, we focus on margin after instalments, which we denote as financial margin. Households without financial margins have several options to avoid defaulting on their loans. They can negotiate lower principal payments, they can reduce their consumption or they can use their financial reserves. Thus, negative margins do not necessarily increase the risk of default.

The main difference between households with and without financial margins is their average net income. This is shown in Table 2. Roughly speaking, the strained financial situation in these households is more often due to low income than high cost of debt.

Households with low and middle income hold most of the exposed debt

In Chart 8, we examine the connection between exposed debt and income level by dividing the households into five equal-sized groups according to net income. The share of exposed debt is highest in the low-income groups. The 20 per cent of households with the highest income holds around one-third of total debt, but only 7 per cent of exposed debt. The two lowest income groups hold 23 per cent of total debt, but 60 per cent of exposed debt. In the lowest income group, more than half of the total debt is held by households without financial margins.

Table 2
Decomposition of financial margin
 Average. NOK 1000. 2003

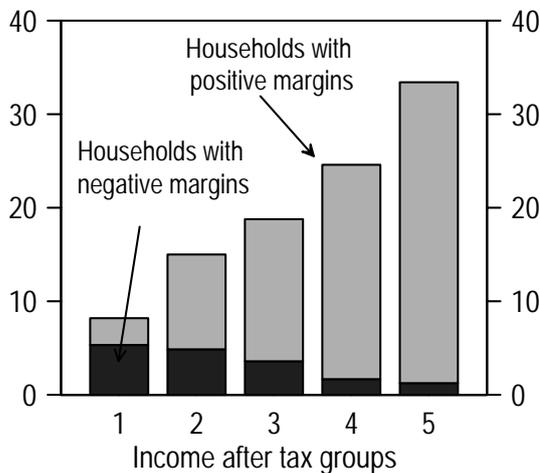
	Income	Cost of living	Instalment	Interest	Margin
Positive margin	454	184	34	41	195
Negative margin	225	169	47	55	-46
Difference	229	15	-13	-14	241

Source: Statistics Norway, SIFO and Norges Bank.

Chart 9 shows developments over time. The two groups with the highest income have reduced their share of exposed debt. There can be two reasons for this. First, the percentage of total income earned by the lowest income group has decreased through the analysis period. At the same time, their percentage of total debt has increased. Second, the percentage of total debt held by the high income groups has decreased, partly because changes in tax rules in the 1990s made it less profitable for high income groups to hold debt.

Chart 8

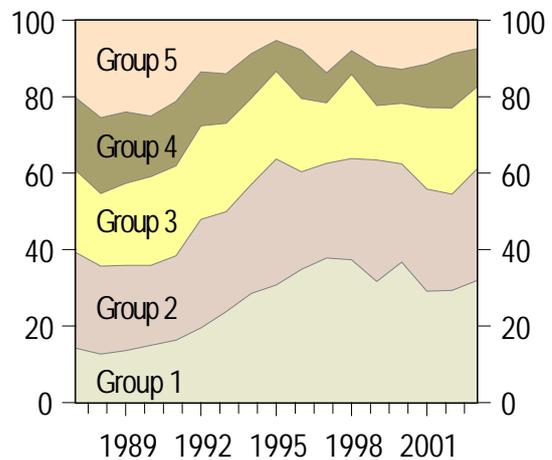
Percentage of total debt after income
 Per cent. 2003



Source: Statistics Norway, SIFO and Norges Bank.

Chart 9

Debt held by households with negative margins after income
 Per cent. 1987-2003



Source: Statistics Norway, SIFO and Norges Bank.

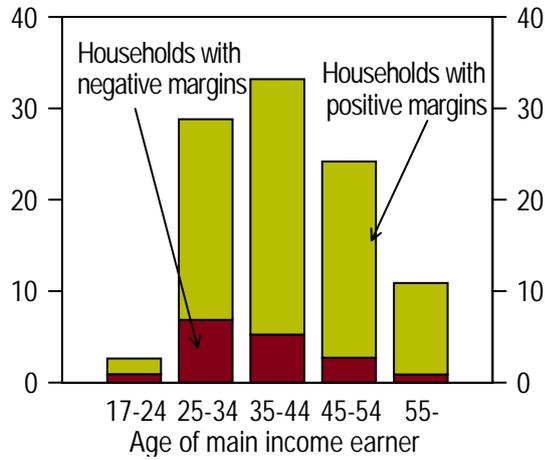
The exposed debt is concentrated in age group 24-35

Chart 10 shows the percentage of total debt by age of the main income earner and households with and without financial margin. The largest percentage of exposed debt is, as expected, held by households with main income earner in the age group 24-35. This is the age group where most first-time house buyers are found. The age group 24-35 holds near 30 per cent of total debt and more than 40 per cent of exposed debt.

Chart 10

Percentage of total debt after age

Per cent. 2003

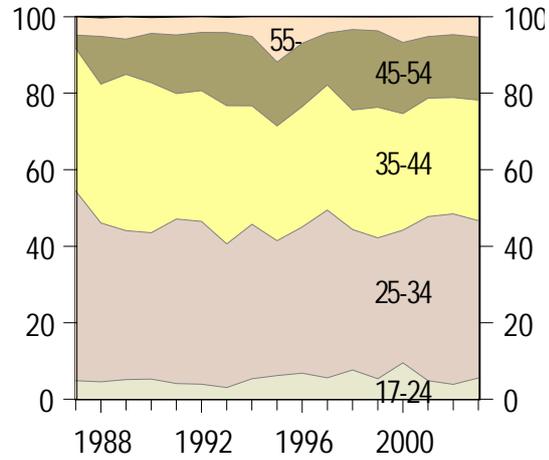


Source: Statistics Norway, SIFO and Norges Bank.

Chart 11

Debt held by households with negative margin after age

Per cent. 1987-2003



Source: Statistics Norway, SIFO and Norges Bank.

In Chart 11, we analyse the development of exposed debt by age group over time. The largest change can be found in the age group 35-44. This group held about 40 per cent of exposed debt around 1990. At the end of the period, the fraction was reduced to 30 per cent. The age group 45-54 in particular has increased their share of exposed debt. The reason for this may be the group's stronger-than-average growth in debt, and that the relative number of household in this age group has increased due to demographic effects (see Riiser and Vatne (2006)).

Is household debt more exposed in Norway than in Sweden?

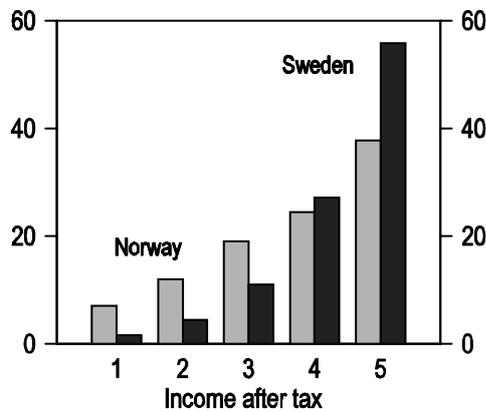
Sveriges Riksbank (2004) concludes in its analyses of margin after interest that there is little risk connected with loans to the household sector. Households in the high income groups have most of the debt, but also the highest margins due to high income and financial assets. They find that a small share (1.2%) of the three highest income classes has negative margin after interest.

Due to differences in the data definitions, the results are not directly comparable with our Norwegian findings. We find, however, in the Norwegian data that the low income groups hold a larger share of total debt than in the Swedish data sample. The two lowest income groups in the Norwegian data set hold almost 20 per cent of total debt compared to 6 per cent in the Swedish data (see Chart 12). The finding that low income groups in Norway hold a larger share of total debt than in Sweden, indicates, all else being equal, that household loans are more exposed in Norway than in Sweden.

Chart 12

Total debt after income

All households. Per cent 2001



Source: Statistics Norway, Norges Bank and Sveriges riksbank.

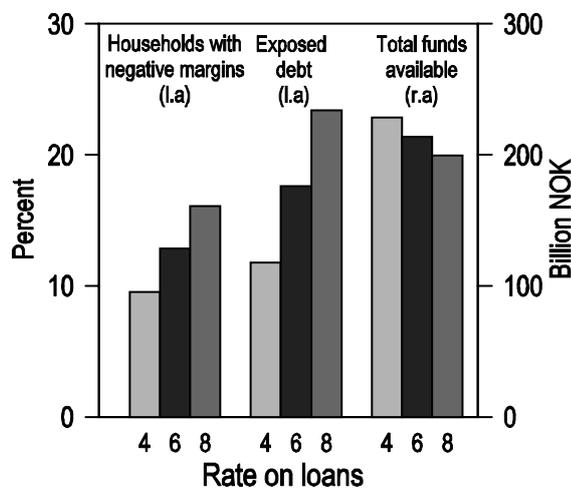
5. How do increased interest rates affect the margins of the households?

The effect of an interest rate increase on household margins depends on the fixed-interest period of loans. The majority of loans feature variable interest rates. For these loans, a change in the interest rate will have a more or less immediate effect, whereas a fixed-interest rate loan will not be affected until it is renegotiated. Banks' lending rates for household loans vary and are primarily based on the quality of the collateral. In this part of the analysis, we look at the effect of an interest rate change if all borrowers are immediately exposed to the same new interest rate. The calculated effect thus exaggerates the actual effect.

Chart 13

The effect of interest rate changes on financial margins

Per cent and billions of NOK

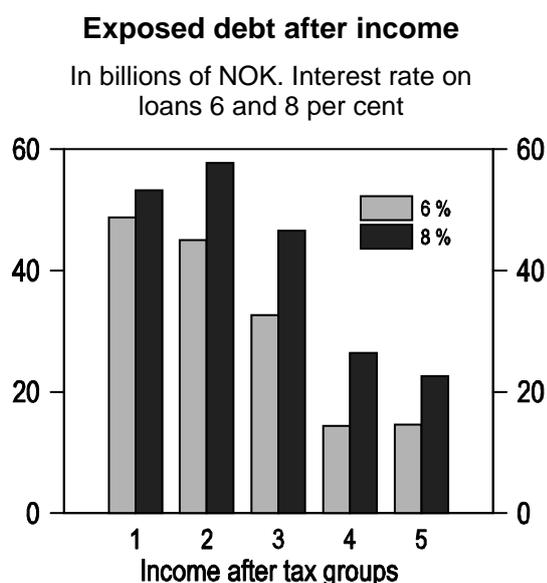


Source: Statistics Norway, SIFO and Norges Bank.

Average bank lending rates were approximately 6 per cent in 2003. Chart 13 shows the calculated effects on financial margins of a plus/minus two percentage point change in interest rate. If the interest rate is increased by 2 percentage points, the share of households with negative margins will increase from 13 per cent to 16 per cent. The share of debt held by households with negative margins will increase from 17 per cent to 23 per cent. The margins will be reduced from 214 to 200 billion 2003-kroner, a reduction of 7 per cent.

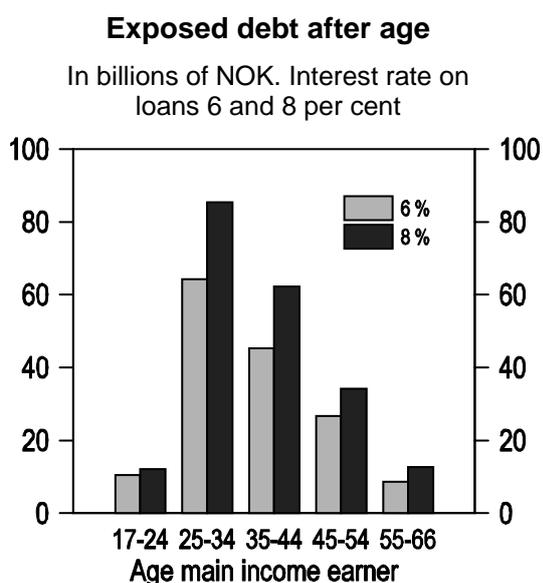
Households in the middle-income groups account for the largest increase in exposed debt (see Chart 14). Most households without financial margins after such an increase in interest rates are in income group two or three. Debt held by households in age group 25-44 is most exposed to a change in interest rate. This is shown in Chart 15.

Chart 14



Source: Statistics Norway, SIFO and Norges Bank.

Chart 15



Source: Statistics Norway, SIFO and Norges Bank.

6. Conclusion

The total funds available in the household sector have increased in the period 1987 to 2003. The reason for this is that total income after tax has increased, and at the same time the share of income used to cover living costs and loan expenses has decreased. In addition, the increase in total financial assets has reduced household vulnerability to an interest rate increase or income reduction.

The share of total debt held by households without financial margins has decreased in the period 1990 to 2003. In isolation, this signals lower credit risk associated with banks' exposure to the household sector.

In 2003, roughly 13 per cent of households had common living expenses and interest and instalment costs that exceeded their income. These households held 17 per cent of total debt. It appears that households have no margins as a result of low income rather than high borrowing and living costs. Households with low income and young households are overrepresented among households without financial margins. The share of total debt held by these households has increased.

The effect of an increase from 6 to 8 per cent in the interest rate paid by households to banks is estimated to be an increase in the share of households without financial margins from 13 to 16 per cent. The share of total debt held by these household rises from 17 to 23 per cent. The total funds available in the household sector decreases by 7 per cent.

References

- BIS (2006): "Housing finance in the global financial market", *CGFS Papers No 26*, pp 29-30.
- DWP (2004): "Tackling over-indebtedness - Action plan 2004", DTI and Department for Work and Pensions (DWP).
- May, Orla, Merxe Tudela and Garry Young (2004): "British household indebtedness and financial stress: a household-level picture", *Bank of England Quarterly Bulletin*; Winter 2004, Vol. 44, Issue 4, pp 14, 414.
- Norges Bank (2006): *Financial Stability 1/06*.
- NOS D310 (2004): "Income and Property Statistics for Households 2002" Official Statistics of Statistics Norway, Oslo-Kongsvinger.
- Redwood, Victoria and Merxe Tudela (2004): "From tiny samples do mighty populations grow? Using the British Household Panel Survey to analyse the household sector balance sheet", *Bank of England Working Papers No 239*.
- SIFO (1987-2003): "Standard Budget", www.sifo.no.
- Riiser, Magdalena D. and Bjørn H. Vatne (2006): "Developments in household debt. An analysis of micro data for the period 1986-2003", *Economic Bulletin*, July 2006, Norges Bank.
- Sveriges Riksbank (2004): *Financial stability report 2004:1*.
- Sveriges Riksbank (2005): *Financial stability report 2005:1*.