■ Swedish households' indebtedness and ability to service debt – an analysis of household data

Despite the sharp expansion in credit to households over a number of years there is not judged to be any considerable risks to banks at the aggregate level. This article analyses the indebtedness and ability to service debt of individual indebted households to ascertain whether this leads to a different conclusion regarding the household sector as a whole. The conclusion is the same. The indebted households appear to have financial buffers that protect them against fairly sharp changes in interest costs and employment income. Consequently, households are not in a position to cause the banks such losses that would threaten stability in the payment system.

As in many other countries the debt burden of Swedish households has risen since the mid-1990s.[49] Household debt in relation to disposable income has therefore returned to the levels seen before the banking crisis at the beginning of the 1990s. The Riksbank's stability assessment concludes that this indebtedness in the household sector as a whole does not constitute a risk for the banks, as the interest costs on the loans comprise a relatively small fraction of the households' disposable income. Although the interest burden is low at aggregate level, there may be groups of households with a high interest burden and small financial margins which could probably be hit harder by increased interest costs or lower income. Consequently, this article also studies the indebtedness and ability to service debt of individual indebted households in order to see whether this changes the overall picture. Do the risks of loan losses from household lending appear higher when taking account of what margins the indebted households have for meeting cost increases and an unexpected loss of income, or do the conclusions in question hold for the household sector as a whole?

The analysis has been performed on the basis of wealth and income data from Statistics Sweden for Swedish households for the years 2000 and 2001.[50] More recent data is unfortunately not available. The article begins with a description of the current debt distribution and ability to service debt among Swedish households. This is followed by a discussion of the possible effects on the ability to service debt of, firstly, a rise in interest rates and, secondly, a loss of income due to increased unemployment. To get an idea of households' vulnerability at present, their indebtedness and ability to service debt is calculated with the aid of changes in interest rates, disposable income and indebtedness at aggregate level. Finally, the article discusses some conclusions for financial stability.

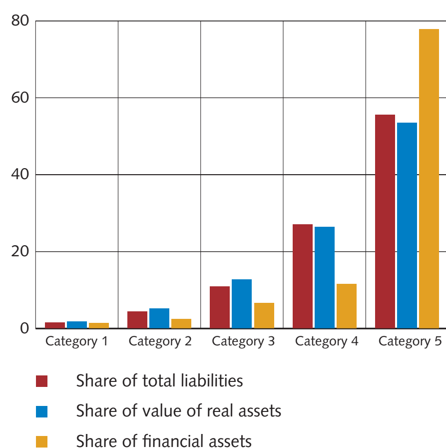
The situation in recent years has not only raised the question of what the sharp expansion in credit could entail for financial stability,

---

49 See the box on page 15 in this Report for a comparison of indebtedness in a number of selected countries, as well as the chapter on Swedish households on page 25 for a discussion of indebtedness and the ability to service debt at macro level in the household sector.

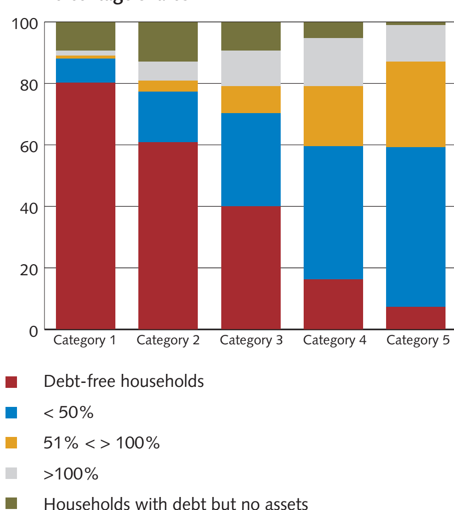
50 Statistics Sweden's HINK/HEK survey, which covers 17,000 households in the respective years.

Figure 1. Assets and liabilities of different income categories in 2001.
Per cent



Sources: Statistics Sweden and the Riksbank.

Figure 2. Indebtedness in each income category in 2001.
Percentage shares



Note. The Figure shows the proportion of debt-free households and the proportion of households with different indebtedness (debt as a percentage of total assets) in the respective income categories.

Sources: Statistics Sweden and the Riksbank.

but also how economic growth could be affected if this development was to be broken. However, the article focuses on the direct stability aspects of the debt situation and leaves any demand effects open.

Indebtedness and the ability to service debt

To analyse households' indebtedness and ability to service debt, the households in question have been divided into five equally large categories according to the level of their disposable income.

DISTRIBUTION OF ASSETS AND LIABILITIES

In total, liabilities constitute just less than 50 per cent of the value of total assets. The most heavily indebted households are also those that hold the majority of the assets. According to the statistics, the lowest income category (category 1) accounts for less than 2 per cent of both the total value of real and financial assets and of the total outstanding debt stock (see Figure 1).[51] The households in the highest income category (category 5) account for more than 55 per cent of the total debt stock. A large proportion of the loans are used to finance housing purchases, as indicated by the fact that this income category owns more than half of the total value of owner-occupied and tenant-owned dwellings. The value of these is twice that of the liabilities. The households in the highest income categories also own close to 80 per cent of the financial assets. The value of these amounts to just over one-third of the liabilities.

The differences in indebtedness and asset holdings are large not only across the different income categories, but also within them. The most heterogeneous group is category 1, where there are sizable deviations between individuals both as regards assets and liabilities. This group is difficult to distinguish since it consists of individuals with very different finances and life situations. The statistics show that a major part of these households or individuals have neither employment income nor assets or liabilities. Less than 20 per cent of the households in this category have debts. In the highest income category more than 90 per cent of the households are indebted and practically all the households also have financial and real assets.

That the debts are largely accounted for by holders of real assets is positive from a lender perspective, since lenders thus have collateral to cover the larger part of the loans. In the majority of the indebted households the real and financial assets exceed the liabilities. This net wealth is also largest in the highest income categories (see Figure 2).

HOUSEHOLDS' ABILITY TO SERVICE DEBT

Should interest costs rise unexpectedly or income decrease,

51 Total assets include households' financial assets including insurance saving, and the market value of owner-occupied and tenant-owned dwellings and secondary dwellings. Other items are rental property, agricultural property and other property including building sites.

households have the possibility to realise any assets they may have. Financial assets are relatively easy to realise and can therefore serve as a financial buffer in the shorter term. Real assets can be seen as a buffer for the longer term as households, for example, can choose less expensive housing. A study of households' ability to service debt requires not only an idea of their asset holdings but also of the size of their income and how large a proportion of this income that goes toward interest expenditure. Table 1 shows the indebted households' financial situation in 2000 and 2001.

Table 1. Indebted households' financial situation in 2000 and 2001. Median values (average in parentheses), SEK thousand and per cent

2000	**Category 1**	**Cat. 2**	**Cat. 3**	**Cat. 4**	**Cat. 5**
Disposable income (SEK thousand)	66 (60)	119 (118)	178 (177)	271 (268)	378 (431)
Debt (SEK thousand)	21 (126)	44 (132)	91 (192)	268 (376)	519 (672)
Financial assets (SEK thousand)	0 (92)	0.9 (81)	26 (163)	68 (255)	170 (605)
Real assets (SEK thousand)	0 (358)	0 (280)	210 (437)	583 (770)	1 035 (1 417)
Interest ratio (%)	0.3 (14.8)	1.5 (3.8)	2.5 (4.4)	4.2 (5.4)	5.6 (6.3)
Debt ratio (%)	36 (767)	36 (114)	52 (108)	100 (140)	131 (156)
Indebtedness (%)	394	117	52	49	43
Share of total liabilities (%)	2.0	4.7	10.7	27.5	55.0
Share of total assets (%)	2.4	4.6	11.6	24.3	57.1
2001	**Category 1**	**Cat. 2**	**Cat. 3**	**Cat. 4**	**Cat. 5**
Disposable income (SEK thousand)	70 (64)	126 (125)	188 (188)	286 (283)	402 (445)
Debt (SEK thousand)	12 (116)	50 (141)	113 (224)	277 (403)	566 (750)
Financial assets (SEK thousand)	0 (102)	1.3 (74)	30 (163)	68 (220)	171 (586)
Real assets (SEK thousand)	0 (280)	0 (309)	287 (500)	614 (842)	1 125 (1 517)
Interest ratio (%)	0.2 (7.0)	1.8 (3.9)	2.7 (4.6)	4.1 (5.2)	5.6 (6.3)
Debt ratio (%)	19 (330)	40 (112)	60 (118)	99 (142)	133 (166)
Indebtedness (%)	87	94	50	49	45
Share of total liabilities (%)	1.6	4.4	11.0	27.1	55.8
Share of total assets (%)	1.7	3.9	10.1	20.7	63.5
Interest cost after tax (SEK thousand)	0.2 (2.5)	2.2 (4.9)	5.1 (8.8)	11.5 (14.7)	23.5 (27.6)

Note. Indebtedness here shows the share of total assets comprised by debt.

In order to get an idea of households' vulnerability to changes in income or expenditure, their financial margins have been calculated, in other words the households' post-tax income after interest expenditure and other regular living costs have been paid (see Table 2). The living costs have been based on calculations by the Swedish Consumer Agency.[52]

52 Households' budget has been estimated by matching family composition with the Swedish Consumer Agency's calculations for living costs as presented in its publication *Koll på pengarna 2004*. When lending to households, banks generally prepare financial estimates for which they usually use the Agency's guidelines, or variations of them, so as to establish the borrowing costs that households can bear.

Table 2. Proportion of households with no financial margins. Per cent in 2001

2001	Category 1	Cat. 2	Cat. 3	Cat. 4	Cat. 5
Households without margins, (%)	20	4.7	1.1	0.0	0.0
Indebted households without margins (%)	100	19	3.3	0.3	0.0
Total proportion of indebted households (%)	20	40	60	83	92
Proportion of total debt (%)	1.6	4.4	11	27	56

The analysis of the ability to service debt becomes somewhat simplified since it can be more difficult in reality for a household to realise its assets or to adapt to lower financial margins. A high-income household is likely to have higher day-to-day expenses than those costs specified here, which means that the margin is overestimated. Correspondingly, the regular living costs have probably been overestimated for many of the households with very low incomes.

The households with the largest debt (category 5) had a median income of SEK 402,000 in 2001, in other words a monthly income after tax of just over SEK 33,000. Their post-tax interest costs totalled just less than SEK 2,000 a month. Thus, the households in this category had wide margins once interest and other regular living costs had been paid. None of the households in this category lacked financial margins according to the definition used here. They also owned a substantial share of the financial and real assets. In 2001 the value of their real assets was twice as high as the households' debt in this category.

Also in the next highest income category, which accounts for just over 25 per cent of the loans, the risk of default is judged to be low. In category 4 the median post-tax income was SEK 286,000, or just less than SEK 24,000 a month. As interest costs amounted to around SEK 1,000 a month the margins were good in this household group as well. A very small proportion of the indebted households in category 4 had no financial margins in 2001. This category also had a buffer in the form of real and financial assets.

The middle income category is the group that appears to have increased its debt most over the two years. One conceivable explanation is that it is these households that have previously been constrained in their ability to borrow. Due to lower interest rates banks have been able to grant additional loans to these households, given that the financial margin requirement has been the same. Higher-income households have most likely not been as restricted, but have been able to borrow the desired amounts previously as well. Just over 10 per cent of the loans are accounted for by category 3. The median income in this group was SEK 188,000 in 2001, or just less than SEK 16,000 a month after tax. At the same time post-tax interest costs amounted to just over SEK 400 a month. The percentage of indebted households with no financial margins was comparatively low. The households in this income category also had a certain buffer in the form of financial and real assets.

It is mainly the households in category 2 that can be viewed as potentially vulnerable. The median household had an annual income of SEK 126,000 in 2001, or just over SEK 10,000 a month after tax. Their monthly interest costs totalled a little less than SEK 200. Calculations of their margins show that almost 20 per cent of the households in this category did not have any income left on which to live once interest and other regular living costs had been paid.

Figure 3 shows how the percentage of indebted households without financial margins changes according as their expenses increase. This gives an idea of their vulnerability.

A markedly large proportion of the households, notably in category 2, had small financial margins in 2001 and were thereby sensitive to increased costs. Were the households' expenses to rise by SEK 1,000 a month, as many as one-third of the households in category 2 would fall below the estimated margin. Figure 4 shows how the households in this income category would be affected by a deterioration in their budget, per decrease by SEK 1,000. Zero on the horizontal scale indicates the point at which the indebted households are exactly at their estimated margin. The percentage of households without margins grows relatively quickly according as their costs increase or their income decreases.

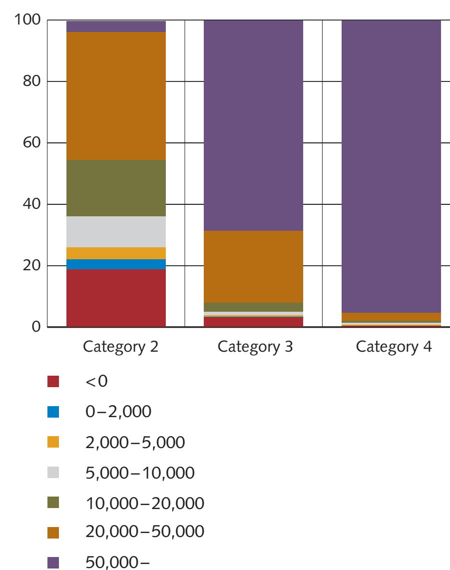
How is the ability to service debt affected by macroeconomic changes?

In the event of a marked deterioration in the ability to pay of weak households with small margins, due for example to higher interest rates or increased unemployment, the households could encounter difficulties in servicing their debt, and banks' credit risks would rise. This section shows how the ability to service debt and the risk of loan losses are affected by a rise in the interest rate and unemployment, respectively, with the aid of partial calculations. The ability to service debt is tested with the assumption that the interest rate is raised by 1 and 4 percentage points, respectively, and that unemployment increases by 1 to 3 percentage points.

The effects that are studied are the impact on the households' interest ratio, the change in the proportion of vulnerable households – that is those households without financial margins - and the impact on banks' exposure to this group. The households' sensitivity is shown by how the proportion of vulnerable households changes after a deterioration in the households' finances. The fraction of the households' total loans that can be attributed to these vulnerable households can be seen as a measure of increased credit risk in lending. Initially the interest ratio is just over 5 per cent. A little less than 10 per cent of all indebted households can be described as vulnerable, that is they have no financial margins for increased costs in the initial position (see Table 3).

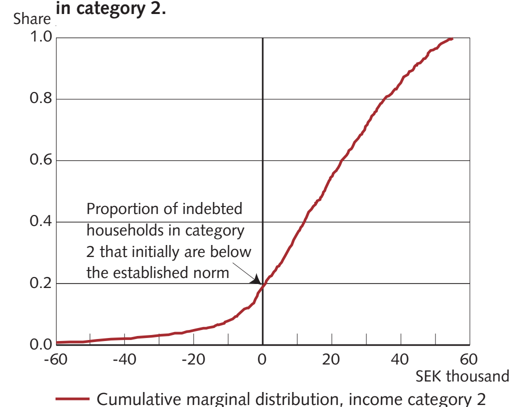
It should be pointed out that this kind of partial calculation does not take account of dynamic effects. Normally interest rates rise in

Figure 3. Percentage of indebted households in various income categories with different financial margins. Per cent



Source: The Riksbank.

Figure 4. Tolerance to rising costs or loss of income in category 2.



Source: The Riksbank.

conjunction with more robust economic activity. Such conditions are also accompanied by stronger household income, but this has not been included in these calculations as income is held constant. Consequently, the effect on the households' ability to service debt is overestimated under the assumption of higher interest rates. Conversely, a rise in unemployment is usually associated with an economic slowdown, which results in a deterioration in income and asset values that is partly compensated for by the fact that interest rates are most likely to fall.

EFFECTS OF RISING INTEREST RATES

How sensitive the households are to changes in the interest rate depends on the fixed-rate terms of their loans. Households with variable-rate loans are affected immediately by a change in rates, while for fixed-rate loans the effect is only felt when the loans are renegotiated. In the following calculations the short-term effects are studied first, in other words given the fixed-rate terms that the Swedish households have on their loans today. This is followed by an analysis of the long-term effects that arise if the change in the interest rate affects the entire stock of debt. All the loans are assumed at that stage to have been renegotiated at the new higher rate.

Table 3. Effects of rising interest rates.

	2001	1 percentage point		4 percentage points	
		Immediate	Full impact	Immediate	Full impact
Int. ratio, average (indebted)	5.2	5.6	5.9	6.9	7.7
Int. ratio, median (indebted)	3.7	4.0	4.2	4.9	5.5
Int. ratio, average (all)	3.3	3.5	3.7	4.3	4.8
(a) Proportion with int. ratio > 10%	14.7	17.3	18.7	25.2	29.6
Percentage of total debt (a)	37.4	41.4	43.6	54.0	60.3
(b) Proportion with int. ratio > 20%	1.8	2.3	2.5	4.3	6.4
Percentage of total debt (b)	6.7	8.4	9.0	15.2	20.2
(c) Percentage with no margin	9.7	9.8	9.9	10.1	10.4
Percentage of total debt (c)	4.7	4.9	5.1	5.7	6.1

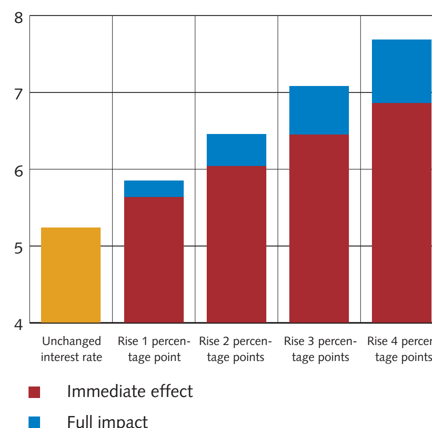
A rise of 1 percentage point in the general level of interest rates would result in an increase in the households' average interest ratio from 5.2 to 5.6 per cent in the short term (see Table 3). The proportion of households below the margin is largely unchanged (9.7 and 9.8 per cent) and thereby also lenders' exposures to this group (4.7 and 4.9 per cent). The credit risk in household lending is thus essentially unchanged.

If the general level of interest rates instead rises by 4 percentage points, the average interest ratio increases by almost 2 percentage points to just below 7 per cent in the short run. But nor does the sharper rise in interest rates affect the proportion of households below the margin to any great extent (9.7 and 10.1 per cent). The banks' exposures increase somewhat more (4.7 and 5.7 per cent), but the percentages are still rather low. One explanation is that the households with tight margins have small loans and low interest costs.

What then is the effect in the longer term, when all loans have been renegotiated at the new, higher interest rate? Here, a rise of 1 percentage point in the general level of interest rates causes the average interest ratio to increase to 5.9 per cent. The proportion of households with no margin still rises marginally (9.7 and 9.9 per cent), as does the banks' exposures to these households (4.7 and 5.1 per cent). In the case of a rise in interest rates of 4 percentage points, the full impact on the interest ratio is an increase of 2.5 percentage points (from 5.2 to 7.7 per cent, see Figure 5). Again the effects are small on the proportion of vulnerable households and the banks' exposures to them (9.7 to 10.4 per cent and 4.7 to 6.1 per cent, respectively).

The conclusion of this exercise is that the households' ability to service debt would not be affected to any great extent by even relatively steep rises in interest rates.

Figure 5. Effects of rising interest rates on the average interest ratio of indebted households in 2001. Per cent



Source: The Riksbank.

EFFECTS OF INCREASED UNEMPLOYMENT

In the event of unemployment a household suffers a loss of income equivalent to the difference between its previous salary and the unemployment benefit it receives from *arbetslöshetskassan*.[53] Could an increase in unemployment affect the risks in household lending in a way that gives cause for concern? In these calculations all gainfully employed persons have been assigned an equally large probability of becoming unemployed, which is likely to mean that the effect is overestimated.[54]

If unemployment rises by 1 percentage point, the interest ratio remains unchanged (see Table 4). The effects on the proportion of vulnerable households and the banks' exposures to them are less than in the case of rising interest rates. Neither do increases in unemployment of 2 and 3 percentage points, respectively, affect the size of the interest ratio. The proportion of vulnerable households rises at most from 9.7 to 9.9 per cent, while the banks' exposures to them increase at the same time from 4.7 to 5.4 per cent.

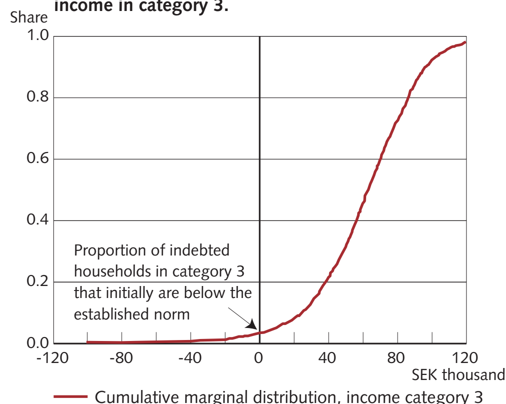
Table 4. Effects of increased unemployment.

	2001	1 percentage point	2 percentage points	3 percentage points
Int. ratio, average (indebted)	5.2	5.2	5.2	5.2
Int. ratio, median (indebted)	3.7	3.8	3.8	3.8
Int. ratio, average (all)	3.3	3.3	3.3	3.3
(a) Proportion with int. ratio > 10%	14.7	14.8	14.9	15.0
Percentage of total debt (a)	37.4	37.5	37.7	37.9
(b) Proportion with int. ratio > 20%	1.8	1.9	1.9	1.9
Percentage of total debt (b)	6.7	6.8	7.0	7.1
(c) Percentage below margin	9.7	9.7	9.8	9.9
Percentage of total debt (c)	4.7	5.3	5.3	5.4

53 Unemployment insurance is constructed in such a way that unemployment benefit is paid at 80 per cent of a worker's pay on income up to approximately SEK 15,000 a month. The loss of income is therefore higher in percentage terms for households with high employment income. For example, individuals with an income above SEK 30,000 a month lose more than half of their post-tax income if they become unemployed while those with an income below the cut-off point lose less than one-fifth of their income after tax (provided that they do not collect supplementary income insurance)

54 The method applied is a Monte Carlo simulation that has been repeated 1,000 times. The average effects have thereafter been calculated.

Figure 6. Tolerance to rising costs or loss of income in category 3.



Source: The Riksbank.

In other words the indebted households' ability to service debt is not particularly sensitive to a change in unemployment. One explanation for this is the composition of the households' debt and income. As stated already the households that have no financial margins or very small margins belong to the lowest income categories. The level of indebtedness was also very limited in these categories.

Figure 6 shows, for example, the distribution of households in category 3, of which only 3 per cent have no margin initially, with regard to income and expenditure. Income can fall by around SEK 25,000 per year before the proportion of households with no margin reaches 10 per cent. Thus, the households in categories 2 and 3 have different conditions on the margin, and the differences are even bigger if these groups are compared with the higher-income categories. Even initially the latter have considerable margins to cope with increases in regular living costs. It is less important, therefore, that their loss of income is relatively larger than in the other groups. The households in the lower-income categories lose a smaller share of their income after becoming unemployed.

Another explanation is that there is a higher number with employment income in the high-income households than in the lower-income categories. 90 per cent of the households in category 5 have two persons with employment income, while the corresponding share in category 2 is only 3 per cent. These factors contribute to the proportion of vulnerable households having risen to such a limited extent in the calculations. That the interest ratio is not affected is partly because the interest rate is held constant in the calculations and partly because the decline in disposable income caused by the rise in unemployment is too small to make any impact on the ratio.

Households' current ability to service debt

So what is the current situation for individual households' ability to service debt? Since 2001 households have continued to borrow at a high rate. The value of real assets has risen, while the value of financial assets has started again to increase after the substantial falls in stock prices. All in all, this situation should if anything have resulted in an improvement in the financial position of the households in the higher-income categories compared with the other categories. In addition the proportion of debt fell in category 1 between 2000 and 2001. If this trend has continued it means that the percentage of vulnerable households has continued to decline. Using the changes that have occurred for the household sector as a whole, the sensitivity of households today to changes in interest rates can be estimated (see Table 5).[55]

55 All households are assumed to have the same development in income and debt, regardless of income category. The households' debt burden and disposable income have been assumed to grow by around 20 and 10 per cent, respectively, during the period from 2001. The proportion of loans that, due to fixed-rate terms, is unaffected by the fall in interest rates during the period is assumed to be 7/10, while the remaining 3/10 are assumed to have adjusted fully. Households' interest costs have been estimated to decrease by about 1 per cent since 2001, taking into account the above assumptions.

Table 5. Effects of rising interest rates on households' interest ratios and on the proportion of vulnerable households and the banks' exposures to them.

	2003/2004	1 percentage point		4 percentage points	
		Immediate	Full impact	Immediate	Full impact
Int. ratio, average (indebted)	4.9	5.1	5.6	6.0	7.7
Int. ratio, median (indebted)	3.5	3.7	4.0	4.3	5.5
Int. ratio, average (all)	3.0	3.2	3.5	3.7	4.8
(a) Proportion with int. ratio > 10%	12.3	14.2	16.7	19.7	29.6
Percentage of total debt (a)	32.1	36.3	40.5	45.4	60.2
(b) Proportion with int. ratio > 20%	1.4	1.7	2.2	2.8	6.3
Percentage of total debt (b)	5.6	6.3	7.9	10.4	20.1
(c) Percentage with no margin	7.1	7.2	7.4	7.5	8.1
Percentage of total debt (c)	3.6	3.7	3.9	4.1	4.7

These calculations show that the initial position is more favourable than in 2001. The interest ratio is somewhat lower, as is the proportion of vulnerable households and the banks' exposures to them. Given the assumption that the composition of the households' income and debt has remained largely unchanged since 2001, the households' ability to service debt has thus improved, in spite of a rise in the debt stock of almost 20 per cent during the same period. A corresponding example with rising unemployment shows also that households appear to be somewhat better equipped to deal with a loss of income today than in 2001. Households' sensitivity to rising interest costs and increasing unemployment should therefore not have increased.

Conclusion

The analysis of individual, indebted households shows that the conclusions drawn regarding the total household sector are the same: the high indebtedness does not pose any appreciable risk to the banks and thereby neither to financial stability.

The majority of the loans are attributable to the highest income categories of those households that also own the real and financial assets. These households have margins left once interest expenses and regular living costs have been paid. The risk that cost increases in the form of higher interest rates would lead to difficulties for many households to service their debt is therefore small. A loss of income following unemployment would indeed greatly reduce the income in this group, but not enough to cause payment difficulties. Since these households also have financial assets and large values in property, the risk of losses in this borrower group is judged to be small.

The most vulnerable households - those that have no margins for unexpected expenses each month - are largely debt-free. All in all, the calculations yield the same results that the recurring assessments at macro level have indicated – that households are not in a position to cause the banks such losses that would threaten financial stability. The high indebtedness, however, could give rise to problems for individual households and even have an impact on consuption and saving, and thereby also on macroeconomic developments. The large margins that households nevertheless appear to have should limit any effects in this regard though. These questions are beyond the scope of this article, however.