

How indebted are Swedish households?

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Swedish households' debts have grown substantially in recent years and are high from a historical perspective. The Riksbank has pointed out, in various contexts, that this development entails risks for both macroeconomic development and financial stability.²

Since 2007, the analysis of household debt has largely been based on aggregate data on households' debts and assets as no data has been available on the individual or household level.³ In recent years, it has also been possible to use the mortgage survey conducted by Finansinspektionen (the Swedish Financial Supervisory Authority) to support the analysis. In this survey, random samples of new borrowers and some aggregate data on the debt stock are gathered from the banks. However, the random samples in the mortgage survey only cover a limited period and only refer to new loans. Consequently, the data in the mortgage survey does not give a clear view of the allocation of debts for existing loans.

With the support of the Sveriges Riksbank Act, the Riksbank has gathered credit information, via credit information agency UC, on all borrowers from the eight largest banks⁴, with the aim of facilitating better analyses of how household debt has developed over time and on the individual and household levels.

This Economic Commentary reports descriptive statistics for the data collected by the Riksbank. The analysis shows that the average debt ratio (debts in relation to disposable incomes) in July 2013 was 296 per cent for indebted individuals and 370 per cent for individuals with mortgages. For indebted households, the debt ratio was 263 per cent, and for households with mortgages 313 per cent.⁵ Regardless of income group and regardless of whether one looks at indebted individuals, indebted households or individuals and households with mortgages, the debt ratio is consistently above 200 per cent and highest among low and middle income earners. For households with mortgages, the analysis also shows that the average debt ratio is over 400 per cent in metropolitan municipalities and just above 300 per cent in the rest of the country. The statistics also show that almost 25 per cent of the stock of households have increased their debts and almost 60 per cent have reduced their debts between 2012 and 2013. If the borrowers who have reduced their debts over this period continue to reduce these debts at the same rate, on average they will be free of debt in about 100 years.

Data on almost four million indebted individuals

With the support of the Sveriges Riksbank Act, the Riksbank has collected information on debts for all borrowers from the eight largest banks via UC. This information covers all loans raised by these borrowers, not just those granted by the eight largest

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2. See, for example, Financial Stability Report 2013:2 and af Jochnick (2014).

3. Since 2007, when wealth tax was abolished, no authority has had the assignment of collecting data on individual's debts and assets. This has made it impossible to analyse debts and assets on the individual or household level.

4. The eight largest banks are Danske Bank, Handelsbanken, Länsförsäkringar Bank, Nordea, SBAB Bank, SEB, Skandiabanken and Swedbank.

5. These are average debt ratios after extreme values have been treated as described in Appendix 2. Without adjustment of extreme values, the average debt ratios would be higher. Study-loan debts and tax debts are not included.

In recent years, the analysis of household indebtedness has been based on aggregate data or random samples of new borrowers. It is not possible to analyse the allocation of debt among individuals and households who actually have debts by examining the aggregate statistics. With the support of the Sveriges Riksbank Act, the Riksbank has collected data on Swedish borrowers on the individual level to better analyse the allocation of households' debts. This Economic Commentary reports descriptive statistics for the allocation of debts in this data by income group, geographical area and age group, and over time.

banks.⁶ The volume of loans in the data set covers about 80 per cent of household loans from monetary financial institutions (MFIs) and 94 per cent of all mortgages.⁷ The data set includes monthly data from July 2010 until July 2013 on various types of credit, taxed earned income after tax, number of co-borrowers, taxation value (only for detached houses), the parish in which the borrower is registered and other information. This means that we have a panel of borrowers extending over 37 months. UC has obtained data on taxed earned income from the Swedish Tax Agency. However, data on wealth or the value of any tenant-owned housing in the material is unavailable. Definitions are explained in detail in Appendix 1, which also includes a list of variables. Appendix 2 describes how data has been managed and Appendix 3 includes descriptive statistics.

The material includes information on almost four million indebted adult individuals, which corresponds to 52 per cent of Sweden's total adult population.⁸ These individuals can be linked to just over 1.8 million households (see Appendix 1 for a description of the household variable). On average, a household consists of 1.7 individuals, with 35 per cent being single-person households.⁹

The total amount of debt in the data amounted to SEK 2,257 billion in July 2013. Of this loan volume, 95 per cent consisted of mortgages, 0.6 per cent of credit card debts and 4.3 per cent of other types of debt.¹⁰ About three million individuals and 1.5 million households have mortgages.

Table 1 illustrates the average disposable incomes and debts for indebted persons with and without mortgages on both the individual and household levels. The table shows that, on average, individuals and households with mortgages have higher incomes after tax but also higher debts than the average for all indebted persons.¹¹ The average indebted individual has three loans, is 50 years of age, and has a debt ratio of 296 per cent.

Table 1. Disposable incomes and total debt at the individual and household level

		INCOME AFTER TAX	TOTAL DEBT
Individual	Average	240,623	586,885
	Median	218,400	394,221
Individual with mortgage	Average	244,645	721,238
	Median	223,300	541,109
		INCOME AFTER TAX	TOTAL DEBT
Household	Average	409,736	990,400
	Median	374,600	650,618
Household with mortgage	Average	422,063	1,177,045
	Median	394,200	845,750

Note. Data from July 2013. See Appendix 2 for a description of how data has been managed and Appendix 3 for descriptive statistics. The values in this table correspond to those in Tables 5-8 in Appendix 3.

Source: The Riksbank

Indebtedness among Swedish individuals and households

As most households pay their borrowing costs from their current incomes, debt as a proportion of disposable income (the debt ratio) provides a good measure of household indebtedness. The debt ratio can also be used to describe the potential interest expenditure as a proportion of disposable income. If the debt ratio is high, changes in interest rates or incomes may make interest expenditure such a great burden that a household is forced to cut back on other consumption or use other assets to meet its

6. The data includes all loans registered by UC.

7. These percentages are after adjustment for extreme values (see Appendix 2). According to Statistics Sweden, loans from MFIs to households amounted to SEK 2,826 billion in July 2013, with 81 per cent of these being mortgages.

8. According to Statistics Sweden, 7.7 million people aged over 17 were resident in Sweden in 2013.

9. According to Statistics Sweden, there were a total of just over four million households in Sweden in 2012 and, of these, 37 per cent were single-person households and 31 per cent were two-person households.

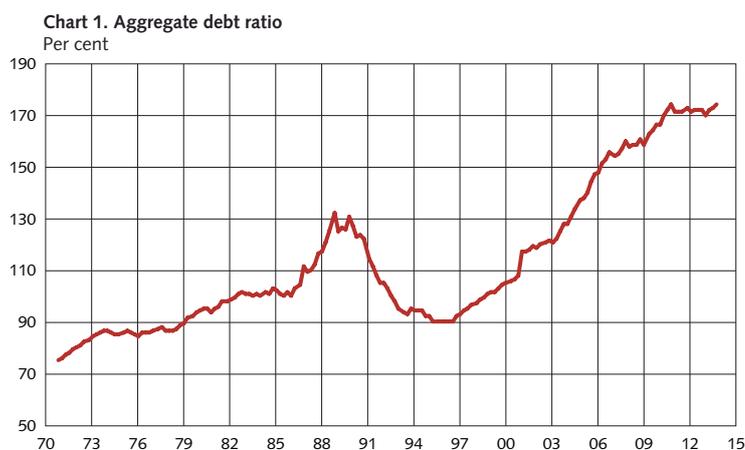
10. Credit card debts can be underestimated as they are usually repaid at the end of each month.

11. In all cases, the median is lower than the average, which indicates that certain incomes and debts are very high.

interest expenditure. In other words, the higher the debt ratio is, the more vulnerable the household becomes to loss of income and interest rate increases.¹²

To provide a better view of indebtedness, in this section we will first review the debt ratio on the aggregate level. After this, we will examine indebted individuals in various income groups and age groups, followed by a review of the debt ratio for indebted households in different income groups. As mortgages form such a large proportion of loans and over three-quarters of all households have mortgages, we will describe these separately. Furthermore, from a risk perspective, it is important to analyse individuals and households with mortgages as the Swedish banks have large exposures towards mortgage borrowers.

The debt ratio for the entire Swedish household sector is usually based on aggregate statistics from Statistics Sweden and is calculated as the household sector's total debt as a percentage of its total income. This is hereafter referred to as the aggregate debt ratio. In the fourth quarter of 2013, the aggregate debt ratio was 174 per cent, which is high from a historical perspective (see Chart 1).



Note. Tax debts and study-loan debts are included in the aggregate debt ratio.

Sources: Statistics Sweden and the Riksbank

When the debt ratio is calculated at aggregate level, the Swedish population's total debts are divided by their total disposable incomes. Individuals who have no debts but do have an income are thereby also included. The level of the debt ratio is therefore affected by the number of indebted households.

When data is used on an individual level, it is possible to calculate an average debt ratio for indebted persons with and without mortgages. However, this calculation can be made in two ways: either as total debts divided by total disposable incomes (that is, in the same way as the aggregate debt ratio is calculated) or as an average of separate individuals' debt ratios.¹³ It is also possible to calculate an average of individual households' debt ratios. Chart 2 compares the aggregate debt ratio for the entire population with that for indebted persons with and without mortgages. Calculating debt ratios for individuals and households who are indebted gives a better view of how vulnerable they actually are. As the chart shows, the debt ratio is higher for indebted persons with and without mortgages than it is for the population of Sweden as a whole. In the remaining part of this Economic Commentary, all average debt ratios have been calculated as a mean value of separate individuals' and households' debt ratios.

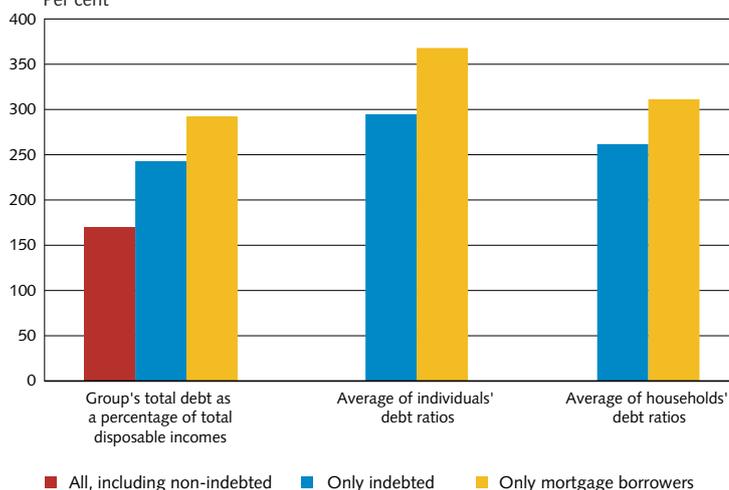
12. As information on interest-rate conditions and the value of housing or assets is not available in the Riksbank's credit data, it is not possible to calculate other measures such as interest ratio, loan-to-value ratio or net equity/assets ratio. Consequently, the analysis of this Economic Commentary is largely restricted to debt ratios.

13. When the average debt ratio is calculated as total debts divided by total incomes, it corresponds to the income-weighted average of individual debt ratios.



Chart 2. Debt ratios for different groups

Per cent



Note. Data from July 2013. The average debt ratios on the individual and household levels are an average of individuals' and households' debt ratios. For the three groups as a whole, the debt ratios are calculated as a proportion of total disposable incomes, which corresponds to an income-weighted mean value of the separate individuals' or households' debt ratios. The bar that shows the debt ratio for "all, including non-indebted persons" is the aggregate debt ratio and is not fully comparable to the debt ratios calculated using the Riksbank's credit data, as there are certain differences in the incomes and debts included. The aggregate debt ratio includes more incomes and debts, for example tax debts and study-loan debts.

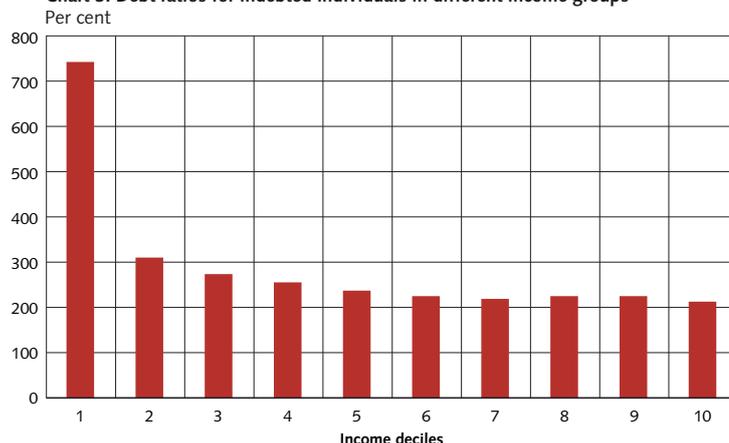
Sources: Statistics Sweden and the Riksbank

Highest debt ratios among individuals with low incomes

The just less than four million indebted individuals in the data material have been divided into ten income deciles and ten age deciles (decile and group are hereafter used synonymously). Income decile one is the tenth of individuals with the lowest incomes and income decile ten is the tenth with the highest incomes. Chart 3 shows the average debt ratio on the individual level in each income group. It shows that the debt ratio on the individual level averages 200 per cent or more in all income groups, and is highest in the lower income groups.¹⁴ The average debt ratio for all indebted individuals is 296 per cent, which is higher than the aggregate debt ratio. For individuals with mortgages, the average debt ratio is 370 per cent. The total debts among the indebted individuals with the highest incomes (income decile ten) correspond to about 18 per cent of the total debts (see Table 2).

14. However, the high debt ratio in the lowest income group should be interpreted with a certain amount of caution, as this group includes, among others, households with highly varied incomes. For example, the group may include self-employed individuals who may have made a loss in a certain year or a large capital gain resulting in a high level of tax and who thus paid no income tax in that year.

Chart 3. Debt ratios for indebted individuals in different income groups



Note. Data from July 2013. The average disposable income per individual was as follows for each income decile: 1: SEK 70,557, 2: SEK 125,414, 3: SEK 157,692, 4: SEK 184,734, 5: SEK 207,726, 6: SEK 229,316, 7: SEK 253,289, 8: SEK 283,804, 9: SEK 328,615, and 10: SEK 565,169. The debt ratio has been calculated as the average debt ratio in each income decile. See Appendix 2 for a description of how data has been managed and Appendix 3 for descriptive statistics.

Source: The Riksbank

Table 2. Proportion of total debts and incomes, per income decile for indebted individuals

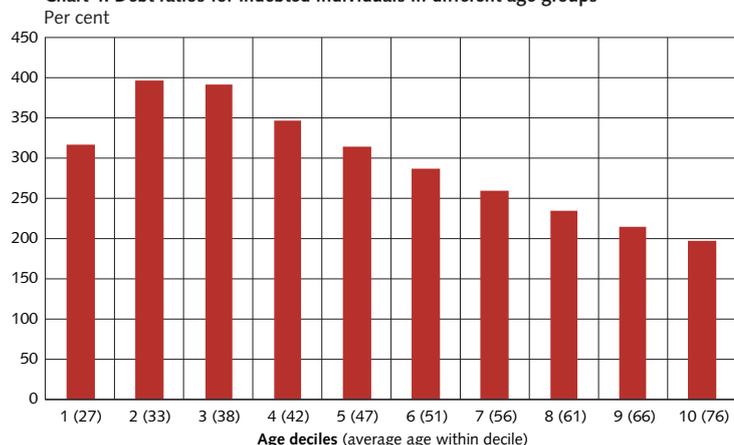
Income decile	DISPOSABLE INCOMES		TOTAL DEBTS	
	Total disposable incomes (SEK billion)	Percentage of total disposable incomes	Total debts (SEK billion)	Percentage of total debts
1	27	2.9	183	8.1
2	48	5.2	152	6.7
3	61	6.6	170	7.5
4	71	7.7	185	8.2
5	80	8.6	191	8.5
6	88	9.5	200	8.9
7	98	10.5	219	9.7
8	109	11.8	251	11.1
9	126	13.7	292	12.9
10	217	23.5	414	18.4
All deciles	925	100	2,257	100

Note. Data from July 2013. See Appendix 2 for a description of how data has been managed and Appendix 3 for descriptive statistics.

Source: The Riksbank

The distribution among different age groups shows that younger borrowers have higher debt ratios than older ones (see Chart 4). At the same time, the average debt ratio is lower in the youngest group than it is in the second youngest one. One explanation for this could be that there are fewer individuals with large loans, for example mortgages, in the group with the youngest borrowers. If we instead examine individuals with mortgages, the debt ratios are significantly higher in all age groups. For example, the debt ratio is 252 per cent for mortgage borrowers in the oldest age group.

Chart 4. Debt ratios for indebted individuals in different age groups



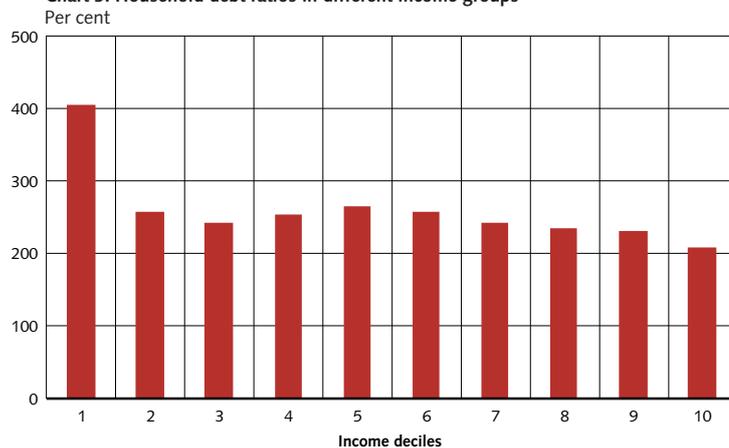
Note. Data from July 2013. The debt ratio has been calculated as the average debt ratio in each age decile. See Appendix 2 for a description of how data has been managed and Appendix 3 for descriptive statistics.

Source: The Riksbank

For households with mortgages, the debt ratios are highest among low-income earners

Many borrowers live in households with more than one wage-earner and also share the obligation to pay for the loan. In the individual-level statistics, the total debt for an individual is calculated as the sum of the personal loans and the proportion of the loans for which the individual has a shared obligation to pay. This means that, in a household with loans with a shared obligation to pay and in which there is one person with a low income and one person with a high income, one person will have a high debt ratio and the other a low debt ratio. Analysing households instead of individuals thus evens out the debt ratios for such households. Consequently, it can be important to also examine debts on the household level (see Appendix 1 for a description of the household variables).

The Riksbank's statistics over indebted households show that debt ratios among all income groups are higher than the aggregate debt ratio based on statistics from Statistics Sweden (see Chart 5). If the first income group is disregarded, debt ratios are highest among average income households. The total debts among the indebted households with the highest incomes correspond to 19 per cent of the total debts (see Table 3).

Chart 5. Household debt ratios in different income groups

Note. Data from July 2013. The average disposable income for households was as follows for each income decile: 1: SEK 106,518, 2: SEK 186,745, 3: SEK 237,848, 4: SEK 288,675, 5: SEK 346,009, 6: SEK 400,582, 7: SEK 451,640, 8: SEK 510,268, 9: SEK 598,591, and 10: SEK 970,366. The debt ratio has been calculated as the average debt ratio in each income decile. See Appendix 2 for a description of how data has been managed and Appendix 3 for descriptive statistics.

Source: The Riksbank

The debt ratios are higher in all income groups among households with mortgages than they are among indebted households in general, and the highest debt ratios are found among the lowest income groups. In all income groups, the average debt ratio is above 200 per cent (see Chart 6).

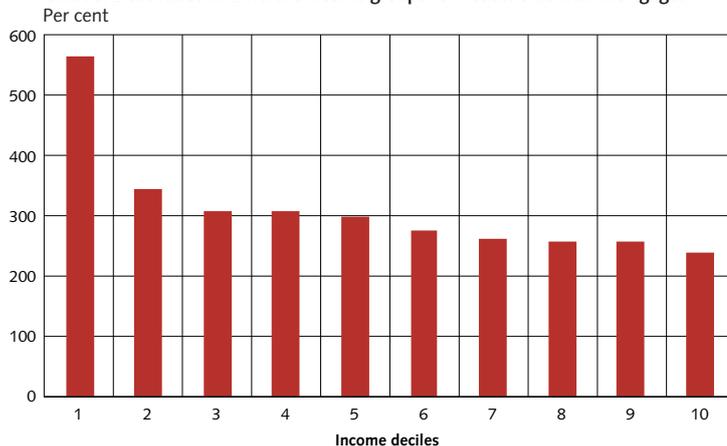
Table 3. Proportion of total debts and incomes, per income decile for indebted households

Income decile	DISPOSABLE INCOMES		TOTAL DEBTS	
	Total disposable incomes (SEK billion)	Percentage of total disposable incomes	Total debts (SEK billion)	Percentage of total debts
1	19	2.6	82	4.6
2	34	4.6	91	5.1
3	43	5.8	107	6.0
4	52	7.0	136	7.6
5	62	8.4	168	9.4
6	72	9.8	188	10.5
7	81	11.0	200	11.2
8	92	12.5	220	12.3
9	108	14.6	254	14.2
10	175	23.7	340	19.0
All deciles	738	100	1,784	100

Note. Data from July 2013. See Appendix 2 for a description of how data has been managed and Appendix 3 for descriptive statistics.

Source: The Riksbank

Chart 6. Debt ratios in different income groups for households with mortgages



Note. Data from July 2013. The average disposable income for households was as follows for each income decile: 1: SEK 117,362, 2: SEK 204,114, 3: SEK 258,400, 4: SEK 313,508, 5: SEK 368,859, 6: SEK 417,514, 7: SEK 464,757, 8: SEK 520,950, 9: SEK 606,715, and 10: SEK 948,734. The debt ratio has been calculated as the average debt ratio in each income decile. See Appendix 2 for a description of how data has been managed and Appendix 3 for descriptive statistics.

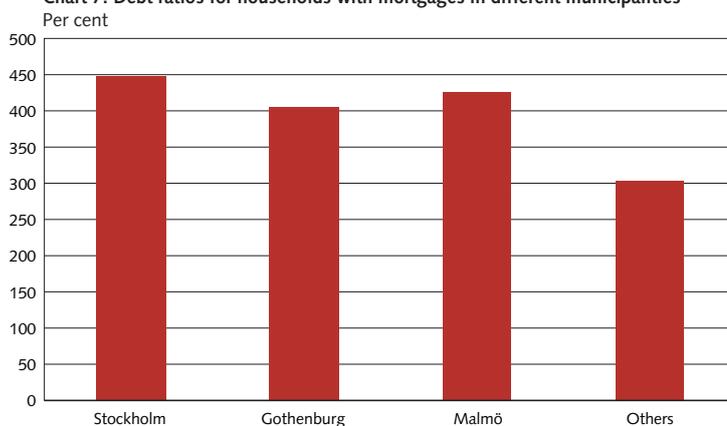
Source: The Riksbank

Indebtedness in various regions

This section describes the geographic allocation of indebted households with mortgages. Chart 7 shows how the debt ratio for households with mortgages is over 400 per cent, which is to say about 100 percentage points higher in the three metropolitan municipalities than in other municipalities. As the allocation is by municipality, the group “others” also includes certain parts of the metropolitan areas that are not included in the metropolitan municipalities. An examination of the proportion of total debts shows that 86 per cent of these are outside the three metropolitan municipalities (see Chart 8). Of the debts held by households with mortgages, 6.6 per cent are in Stockholm Municipality.

If we look at the county level instead, we see that about one-quarter of the total debts are in Stockholm County, one-sixth are in Västra Götaland County and one-seventh are in Skåne County.¹⁵ In July, the average debt ratios for households with mortgages were 430 per cent in Stockholm County, 324 per cent in Västra Götaland County, 352 per cent in Skåne County and 265 per cent in the rest of the country.

Chart 7. Debt ratios for households with mortgages in different municipalities

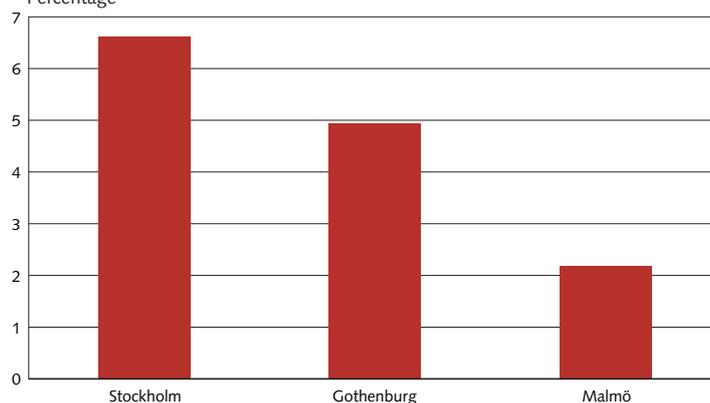


Note. Data from July 2013. See Appendix 2 for a description of how data has been managed and Appendix 3 for descriptive statistics.

Source: The Riksbank

15. In total, 57.5 per cent of debts for households with mortgages are in the metropolitan counties. At the same time, these counties make up 52 per cent of the Swedish population.

Chart 8. Proportion of total debts in different municipalities, for households with mortgages
Percentage



Note. Data from July 2013. See Appendix 2 for a description of how data has been managed and Appendix 3 for descriptive statistics.

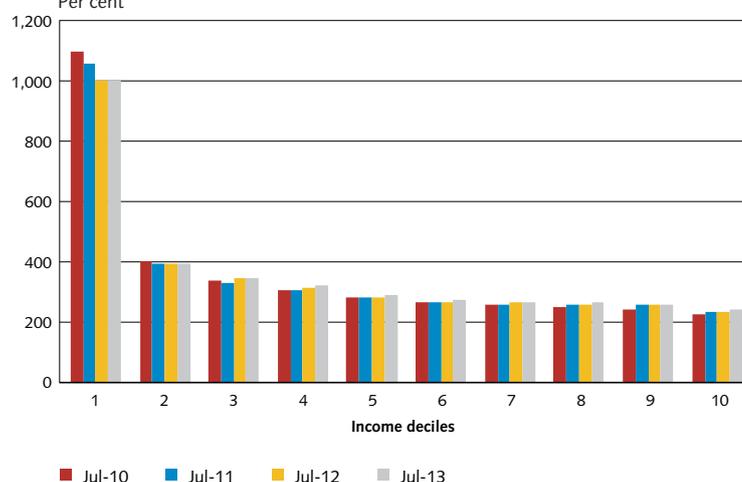
Source: The Riksbank

The development of debts over time

One advantage of the data set to which the Riksbank has access is that it allows us to follow individuals over time. This also allows us to analyse how their debts have changed.

According to Chart 9, debt ratios for individuals with mortgages have increased in most income groups. Even though these increases do not seem significant, debt ratios increased by more than ten percentage points between July 2010 and July 2013 in many income groups, above all the higher ones. The largest increase was in income group eight, in which the average debt ratio for mortgage borrowers increased by about 19 percentage points.

Chart 9. Debt ratios in different income groups for individuals with mortgages
Per cent



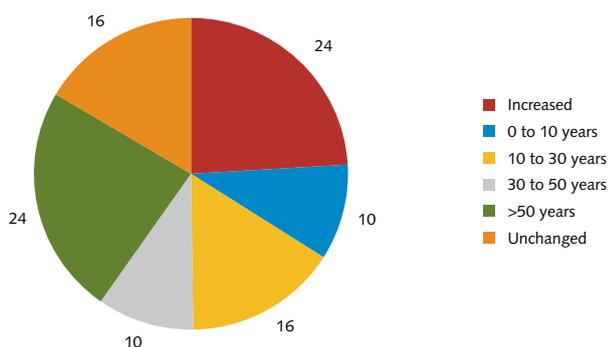
Note. The average disposable incomes for individuals with mortgages at the four dates were within the following intervals in each income decile: 1: SEK 64,527-73,271, 2: SEK 117,299-129,148, 3: SEK 147,069-162,158, 4: SEK 170,967-189,355, 5: SEK 191,403-212,381, 6: SEK 211,122-234,529, 7: SEK 232,782-259,509, 8: SEK 259,623-290,747, 9: SEK 300,568-36,665, and 10: SEK 500,191-88,574. The debt ratio has been calculated as the average debt ratio in each income decile. See Appendix 2 for a description of how data has been managed and Appendix 3 for descriptive statistics.

Source: The Riksbank

Analysing the development of debts over time can give an indication of the state of individuals' amortisations. As amortisations according to the loan agreement are not included in the data set, we have instead examined the change in the debt balance from one year to the next. These rates of change should not be interpreted as amortisations according to contract, but as net amortisations, which is to say amortisations minus newly-raised loans.

Between July 2012 and July 2013, 24 per cent of individuals with mortgages increased their debts, 16 per cent had an unchanged level of debt and 60 per cent decreased their debts (see Chart 10). If the individuals that had reduced their debts continue to do so at the same rate as between July 2012 and July 2013, these individuals will become debt-free after an average of 99 years. 24 per cent of individuals with a mortgage during this period reduced their total debt at a rate corresponding to an amortisation period of 50 years or more. For this 24 per cent, the average rate of change corresponds to an amortisation period of 216 years.¹⁶ Ten per cent of individuals pay off their debt over an average of 39 years, 16 per cent over 19 years and ten per cent over five years. Over the three years for which there is data, the proportion of individuals reducing their debts has increased and the proportion increasing their debts has decreased. However, we now have a greater share of individuals reducing their debts at an ever-slower pace (see Chart 11).

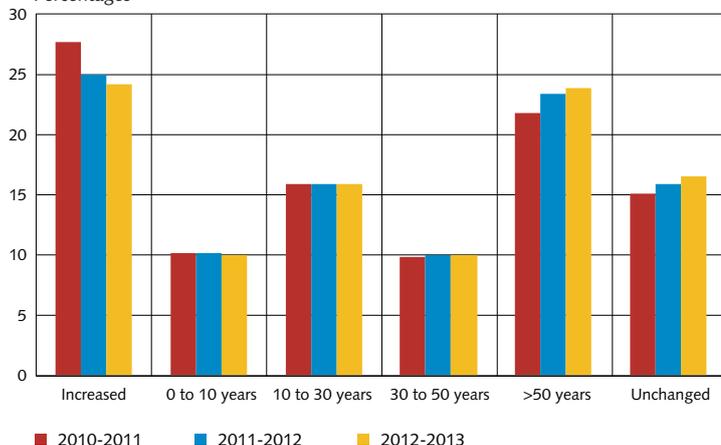
Chart 10. Change in debt for individuals with mortgages (July 2012-July 2013)
Percentages



Note. See Appendix 2 for a description of how data has been managed and Appendix 3 for descriptive statistics.

Source: The Riksbank

Chart 11. Change in debt for individuals with mortgages
Percentages



Note. 2010-2011 refers to July 2010 to July 2011, 2011-2012 is July 2011 to July 2012, and 2012-2013 is July 2012 to July 2013. See Appendix 2 for a description of how data has been managed and Appendix 3 for descriptive statistics.

Source: The Riksbank

References

Af Jochnick, Kerstin, 2014, *Why does the Riksbank care about household indebtedness?* Sveriges Riksbank.

Financial Stability Report 2013:2. Sveriges Riksbank.

¹⁶ The rates of change do not necessarily reflect actual amortisations or maturities.

Appendix 1. Description of variables

VARIABLE	DEFINITION
Disposable income	Taxed earned income +/- capital surplus/deficit – final tax UC has obtained data on taxed earned income from the Swedish Tax Agency.
LKF code	County, municipality and parish code.
Postal code	Five-figure postal code.
Age	The person's age is given in years and is updated at the month of their birth.
Serial number, address	The address is given as a serial number so that individuals cannot be identified.
Serial number, person	Each individual is assigned a serial number to prevent the person being identified by their personal identity number.
Serial number, credit	Each loan has a serial number.
Credit type	Credit type reflects the purpose of the credit. The different categories are credit card, repayment, collateral-free loan, loan against collateral, real estate mortgage, leasing and mortgage against collateral in tenant-owned apartment. A mortgage borrower is defined as a person with a mortgage against either real estate or collateral in a tenant-owned apartment. Study loans and tax debts are not included.
Credit balance	The balance of each loan has been divided by the number of borrowers so that each individual's balance reflects their part of the loan. In the Riksbank's data, the balance is updated on the first day of the month.
Number of co-borrowers	Number of persons who are co-borrowers of the loan.
Household ID	As exact information on the individuals included in a household was not available to the Riksbank, a household has been defined as individuals living at the same postal address and having a joint loan. All data presented at the household level is the sum of the variables in question for the individuals included in the household according to this definition. An example of one limitation of this definition is that two persons living together appear to be a single-person household if only one of them has raised a loan. When the debt ratio is calculated for such a household, for example, the income of the second person is not captured. Consequently, the debt ratio can be calculated as higher than it actually is.

Appendix 2. Management of data

With the support of the Sveriges Riksbank Act, the Riksbank originally received two data sets from UC. One of these was panel data on the credit level, which specified, among other things, the balance of credit, the type of credit and the individuals (according to serial number, person) with obligation to pay for the credit. The other panel data set, which was on the personal level, included information on individuals' incomes, taxes, ages, postal addresses and other details. The Riksbank has only examined these statistics after individuals' personal identity numbers and postal addresses have been replaced by serial numbers.

Data at the individual level

To create a panel data set on the individual level with the sum of the personal loans, the two data sets were combined using the serial number for the person. Certain considerations were necessary in the management of the data material.

In the first stage of the data management, we divided the sum of the loan amount by the number of persons listed as co-borrowers, so two individuals acting as co-borrowers for a loan of SEK 1 million would each have a debt of SEK 500,000. Only this share has been included in the individual's total debts.

The second stage involved eliminating loans for which the number of co-borrowers does not match the persons raising the loan. This corresponded to one per cent of the total number of loans.

Having created a data set of loans on the individual level, we had to eliminate certain observations, for example to make an analysis of debt ratios possible. In the third stage of data management, we therefore assumed that the individual has a taxed income and at least one loan. In the fourth stage, we removed observations in which individuals only have a debt but no declared income. However, this only affected a small proportion of the observations, about one per cent. In the fifth stage, we excluded individuals with a declared disposable income of exactly SEK 0, as no debt ratio could be calculated for them. This corresponded to 0.4 per cent of observations.

In the sixth stage, we eliminated observations in which information on age was absent. This removed 0.2 per cent of observations.

In the seventh stage, we eliminated observations in which disposable income was negative. Given the previous stages, eliminations in this stage corresponded to 1.6 per cent of observations.

The final stage of data management on the individual level involved the exclusion of individuals with only an unused limit, for example if an individual has a credit card with a limit of SEK 10,000 that he or she does not use. Including these individuals would mean including individuals without one krona in actual debt. If we had instead defined debts as limits and not actual debts, the debts in this Economic Commentary would have been higher. This stage results in the removal of 8.7 per cent of the observations.

A large part of the statistics presented in this Economic Commentary examine mortgage borrowers' total debt burden. A mortgage borrower is defined as a person who holds a mortgage against real estate or against collateral in a tenant-owned apartment. The debts reported for the mortgage borrowers refer to their total debts and not just their mortgages.

As the Riksbank did not have access to information on actual amortisations, the calculation of the rate of repayment has been based on how the debt balance changed between July of one year and July of the following year. Consequently, we have only included those individuals with debts in both periods. If an individual repays their entire debt and disappears from the data material, that individual's repayment will therefore not be included in the calculation. Similarly, individuals who only have a debt in the second period are not included in the calculation of repayment rates.

Data at the household level

Once we had compiled a data set of debts on the individual level, we also wanted to create a data material on the household level. The Riksbank does not have access to information on the individuals included in a household according to the definition used by Statistics Sweden. Consequently, we created a household variable in which individuals with the same postal address and serial number for a loan, which is to say a joint obligation to pay, were defined as a household.¹⁷ As mentioned above, one advantage of examining debts on the household level is that individuals in a household often have joint responsibility for loans. For example, if one member of a household has a high income and the other a low income, this will affect the debt ratio, as one will have a low debt ratio and the other a high one. Consequently, an analysis on the household level can provide a better view of the debt burden as the debt ratio is based on the household's total debt and total income. However, one disadvantage of this definition of the household variable is that it does not capture all incomes in a household where, for example, there are two incomes but only one person has a formal obligation to pay for the loan. A debt ratio for this household should be interpreted as an upper limit, as only the income for the person with the obligation to pay is included in the calculation.

Just as on the individual level, we exclude households with SEK 0 in actual total debt. This removed 6.3 per cent of observations on the household level.

When the household variable was created according to the matching described above, we discovered certain households that consisted of an unreasonable number of individuals.¹⁸ To prevent these households from distorting the results, we decided to eliminate households consisting of five or more borrowers. This elimination removed almost 4.6 per cent of households.

According to Statistics Sweden, 37 per cent of Swedish households are single-person households and 31 per cent are two-person households. According to our definition of households, 35 per cent of the credit data set consists of single-person households and 59 per cent of two-person households.¹⁹ However, it is difficult to compare these figures as we have measured the size of the household in terms of the number of borrowers, whereas Statistics Sweden has used the number of adults and children. Our assessment is that the results reported in this Economic Commentary would not be greatly different if we had chosen to define households in the same way as Statistics Sweden.²⁰

The panel data set on the household level is based on the data set on the individual level. In cases in which an individual has a loan together with a person outside the household, the proportion of the loan outside the household which accrues to the individual within the household will be included in the household's total debt.

Management of extreme values

The calculation of debt ratios on the individual or household levels leads to certain extreme values, which is to say very high debt ratios. If these extreme values are included in the statistics, they can have a great impact on the average debt ratio, even if it is only a matter of a few individuals. One alternative would be to exclude all of these individuals from the data material. However, so as not to lose observations, we have instead chosen to apply a generally accepted method for managing extreme values known as Winsorisation. When calculating debt ratios on the individual and household levels, we Winsorised the ninety-ninth percentile. In practice, this means that extreme values were replaced by values in the ninety-ninth percentile. Aberrant observations are thus given less weight and the calculation of the average becomes based on more representative individuals. The median is not affected by extreme values and thus not by Winsorisation. The affect of Winsorisation on the mean value of the debt ratio is illustrated by Table 4. This shows that debt ratios are significantly higher if Winsorisation is not applied.

17. Children are thereby not included in this definition of households.

18. For example, we had households that consisted of over 500 persons and, as we cannot accept that these are actually households, we chose to eliminate households consisting of five or more persons.

19. As only individuals raising loans are included in the data set, children for example are not included in the calculation.

20. The definition of household applied in this Economic Commentary gives rise to debt ratios that are consistent with ratios based on Statistics Sweden's definition of households.

Table 4. Debt ratios with and without Winsorisation

	INDIVIDUALS	INDIVIDUALS WITH MORTGAGES	HOUSEHOLD	HOUSEHOLDS WITH MORTGAGES
With Winsorisation	296	370	263	313
Without Winsorisation	583	715	397	469

Note. Data from July 2013.

Source: The Riksbank

Appendix 3. Descriptive statistics

Table 5. Descriptive statistics for indebted individuals

YEAR	VARIABLE	Indebted individuals											NUMBER OF INDIVIDUALS
		AVERAGE	MIN	P5	P10	P25	MEDIAN	P75	P90	P95	MAX	STD	
2010	Disposable income (SEK thousand)	215	0	69	96	143	197	253	324	390	284,030	367	3,699,985
2011	Disposable income (SEK thousand)	226	0	72	100	150	207	268	345	416	354,487	329	3,777,425
2012	Disposable income (SEK thousand)	235	0	76	103	154	213	276	355	430	410,673	452	3,813,904
2013	Disposable income (SEK thousand)	241	0	79	107	158	218	283	364	438	381,333	499	3,845,976
2010	Total debt (SEK thousand)	504	0	5	19	108	331	708	1,182	1,525	190,000	669	3,699,985
2011	Total debt (SEK thousand)	538	0	5	17	111	353	758	1,256	1,625	332,904	762	3,777,425
2012	Total debt (SEK thousand)	564	0	5	18	118	375	800	1,309	1,693	425,076	799	3,813,904
2013	Total debt (SEK thousand)	587	0	5	17	122	394	833	1,358	1,750	438,528	832	3,845,976
2010	Mortgage debt (SEK thousand)	476	0	0	0	69	311	686	1,152	1,500	190,000	654	3,699,985
2011	Mortgage debt (SEK thousand)	509	0	0	0	72	333	735	1,229	1,590	329,851	745	3,777,425
2012	Mortgage debt (SEK thousand)	535	0	0	0	80	352	770	1,278	1,650	415,976	776	3,813,904
2013	Mortgage debt (SEK thousand)	559	0	0	0	86	372	805	1,328	1,715	429,590	815	3,845,976
2010	Credit card debt (SEK thousand)	2	0	0	0	0	0	0	8	15	1,284	8	3,699,985
2011	Credit card debt (SEK thousand)	3	0	0	0	0	0	1	9	18	1,198	9	3,777,425
2012	Credit card debt (SEK thousand)	3	0	0	0	0	0	1	10	19	1,384	10	3,813,904
2013	Credit card debt (SEK thousand)	3	0	0	0	0	0	1	10	19	3,213	10	3,845,976
2010	Other debts (SEK thousand)	25	0	0	0	0	0	16	81	131	85,000	127	3,699,985
2011	Other debts (SEK thousand)	26	0	0	0	0	0	15	84	136	100,000	122	3,777,425
2012	Other debts (SEK thousand)	26	0	0	0	0	0	14	85	137	95,726	122	3,813,904
2013	Other debts (SEK thousand)	25	0	0	0	0	0	14	85	138	90,069	119	3,845,976
2010	Total debt/Disposable income (%)	293	0	3	12	58	172	363	639	935	2,838	418	3,699,985
2011	Total debt/Disposable income (%)	291	0	3	10	58	175	366	631	912	2,747	405	3,777,425
2012	Total debt/Disposable income (%)	292	0	2	10	60	180	374	638	912	2,578	390	3,813,904
2013	Total debt/Disposable income (%)	296	0	2	10	60	185	380	644	918	2,592	392	3,845,976
2010	Mortgage debt/Disposable income (%)	274	0	0	0	36	160	349	619	903	2,665	401	3,699,985
2011	Mortgage debt/Disposable income (%)	272	0	0	0	36	163	352	611	880	2,581	388	3,777,425
2012	Mortgage debt/Disposable income (%)	274	0	0	0	39	169	360	619	882	2,440	376	3,813,904
2013	Mortgage debt/Disposable income (%)	279	0	0	0	40	174	367	626	891	2,469	380	3,845,976
2010	Credit card debt/Disposable income (%)	1	0	0	0	0	0	0	4	8	23	4	3,699,985
2011	Credit card debt/Disposable income (%)	2	0	0	0	0	0	1	5	9	26	4	3,777,425
2012	Credit card debt/Disposable income (%)	2	0	0	0	0	0	1	5	9	27	4	3,813,904
2013	Credit card debt/Disposable income (%)	2	0	0	0	0	0	1	5	9	27	4	3,845,976
2010	Other debts/Disposable income (%)	13	0	0	0	0	0	9	45	74	185	31	3,699,985
2011	Other debts/Disposable income (%)	13	0	0	0	0	0	8	44	73	184	31	3,777,425
2012	Other debts/Disposable income (%)	12	0	0	0	0	0	7	43	71	171	29	3,813,904
2013	Other debts/Disposable income (%)	12	0	0	0	0	0	7	42	70	157	28	3,845,976
2010	Age	49	18	27	30	38	48	60	68	73	103	14	3,699,985
2011	Age	49	18	27	30	38	48	60	69	74	104	15	3,777,425
2012	Age	50	18	27	30	38	48	61	69	74	105	15	3,813,904
2013	Age	50	18	27	30	38	49	61	70	74	104	15	3,845,976

Note. For each year, the values are revised as per 1 July. See Appendix 1 for a definition of the variables. Total debt refers to the sum of the balances of all individual types of loan. Mortgages refers to loans against real estate or against collateral in tenant-owned apartments. Credit card debt refers to debts from credit cards and debit cards. Other debts refers to total debts minus mortgages and credit card debts. For the variables "total debt/disposable income", "mortgage/disposable income", "credit card debt/disposable income" and "other debts/disposable income", extreme values have been managed as described in Appendix 2. Amounts are expressed in SEK thousands, which means that the zeros in the minimum values for incomes and total debts are less than SEK 500 but greater than zero.

Source: The Riksbank

Table 6. Descriptive statistics for individuals with mortgages

YEAR	VARIABLE	Individuals with mortgages											NUMBER OF INDIVIDUALS
		AVERAGE	MIN	P5	P10	P25	MEDIAN	P75	P90	P95	MAX	STD	
2010	Disposable income (SEK thousand)	220	0	72	99	147	201	259	333	401	284,030	325	2,931,889
2011	Disposable income (SEK thousand)	232	0	76	104	155	212	276	355	427	354,487	298	2,991,037
2012	Disposable income (SEK thousand)	239	0	79	107	158	218	283	365	441	320,613	344	3,040,807
2013	Disposable income (SEK thousand)	245	0	81	110	162	223	290	373	448	381,333	370	3,073,843
2010	Total debt (SEK thousand)	621	0	70	113	230	455	827	1,296	1,650	190,000	700	2,931,889
2011	Total debt (SEK thousand)	665	0	74	119	246	492	888	1,380	1,754	332,904	807	2,991,037
2012	Total debt (SEK thousand)	694	0	76	124	256	514	928	1,433	1,823	425,076	845	3,040,807
2013	Total debt (SEK thousand)	721	0	78	128	268	541	968	1,486	1,890	438,528	877	3,073,843
2010	Mortgage debt (SEK thousand)	601	0	66	105	217	435	802	1,269	1,613	190,000	682	2,931,889
2011	Mortgage debt (SEK thousand)	643	0	69	111	231	469	860	1,350	1,717	329,851	784	2,991,037
2012	Mortgage debt (SEK thousand)	671	0	72	116	243	495	900	1,400	1,785	415,976	815	3,040,807
2013	Mortgage debt (SEK thousand)	699	0	74	121	252	516	940	1,452	1,850	429,590	856	3,073,843
2010	Credit card debt (SEK thousand)	2	0	0	0	0	0	0	5	12	1,284	7	2,931,889
2011	Credit card debt (SEK thousand)	2	0	0	0	0	0	0	7	15	1,198	9	2,991,037
2012	Credit card debt (SEK thousand)	3	0	0	0	0	0	0	8	16	976	9	3,040,807
2013	Credit card debt (SEK thousand)	3	0	0	0	0	0	0	8	16	856	10	3,073,843
2010	Other debts (SEK thousand)	18	0	0	0	0	0	0	56	104	85,000	105	2,931,889
2011	Other debts (SEK thousand)	20	0	0	0	0	0	0	62	113	100,000	115	2,991,037
2012	Other debts (SEK thousand)	20	0	0	0	0	0	0	64	117	95,726	120	3,040,807
2013	Other debts (SEK thousand)	20	0	0	0	0	0	0	65	118	80,295	107	3,073,843
2010	Total debt/Disposable income (%)	369	0	36	58	118	233	425	718	1,059	3,728	503	2,931,889
2011	Total debt/Disposable income (%)	366	0	37	59	121	237	427	707	1,030	3,609	486	2,991,037
2012	Total debt/Disposable income (%)	365	0	37	60	123	243	434	712	1,023	3,358	460	3,040,807
2013	Total debt/Disposable income (%)	370	0	37	61	126	248	439	717	1,030	3,360	462	3,073,843
2010	Mortgage debt/Disposable income (%)	357	0	34	55	111	223	413	702	1,033	3,615	489	2,931,889
2011	Mortgage debt/Disposable income (%)	354	0	35	56	114	227	414	689	1,003	3,487	471	2,991,037
2012	Mortgage debt/Disposable income (%)	354	0	35	57	116	233	421	694	997	3,263	448	3,040,807
2013	Mortgage debt/Disposable income (%)	358	0	35	57	119	238	427	701	1,008	3,281	452	3,073,843
2010	Credit card debt/Disposable income (%)	1	0	0	0	0	0	0	2	6	19	3	2,931,889
2011	Credit card debt/Disposable income (%)	1	0	0	0	0	0	0	3	7	22	3	2,991,037
2012	Credit card debt/Disposable income (%)	1	0	0	0	0	0	0	3	7	23	4	3,040,807
2013	Credit card debt/Disposable income (%)	1	0	0	0	0	0	0	3	7	23	3	3,073,843
2010	Other debts/Disposable income (%)	9	0	0	0	0	0	0	29	56	152	24	2,931,889
2011	Other debts/Disposable income (%)	9	0	0	0	0	0	0	30	57	156	25	2,991,037
2012	Other debts/Disposable income (%)	9	0	0	0	0	0	0	31	57	150	24	3,040,807
2013	Other debts/Disposable income (%)	8	0	0	0	0	0	0	30	56	140	23	3,073,843
2010	Age	49	18	28	32	38	48	60	68	73	103	14	2,931,889
2011	Age	50	18	28	32	39	49	60	68	73	104	14	2,991,037
2012	Age	50	18	28	32	39	49	61	69	74	105	14	3,040,807
2013	Age	50	18	28	32	39	49	61	69	74	104	14	3,073,843

Note. For each year, the values are revised as per 1 July. See Appendix 1 for a definition of the variables. Total debt refers to the sum of the balances of all individual types of loan. Mortgages refers to loans against real estate or against collateral in tenant-owned apartments. Credit card debt refers to debts from credit cards and debit cards. Other debts refers to total debts minus mortgages and credit card debts. For the variables "total debt/disposable income", "mortgage/disposable income", "credit card debt/disposable income" and "other debts/disposable income", extreme values have been managed as described in Appendix 2. Amounts are expressed in SEK thousands, which means that the zeros in the minimum values for incomes, total debts and mortgages are less than SEK 500 but greater than zero.

Source: The Riksbank

Table 7. Descriptive statistics for indebted households

YEAR	VARIABLE	Indebted households											NUMBER OF HOUSEHOLDS
		AVERAGE	MIN	P5	P10	P25	MEDIAN	P75	P90	P95	MAX	STD	
2010	Disposable income (SEK thousand)	365	0	103	139	213	335	454	593	713	324,340	514	1,799,427
2011	Disposable income (SEK thousand)	385	0	108	146	225	355	482	630	756	411,280	480	1,784,598
2012	Disposable income (SEK thousand)	400	0	111	150	232	365	496	650	782	410,750	661	1,795,442
2013	Disposable income (SEK thousand)	410	0	115	155	238	375	509	667	800	381,654	678	1,801,725
2010	Total debt (SEK thousand)	846	0	8	34	186	552	1,187	2,008	2,625	190,000	1,040	1,799,427
2011	Total debt (SEK thousand)	908	0	7	33	198	594	1,278	2,158	2,804	177,656	1,148	1,784,598
2012	Total debt (SEK thousand)	951	0	7	33	205	621	1,344	2,253	2,924	263,514	1,212	1,795,442
2013	Total debt (SEK thousand)	990	0	6	33	212	651	1,401	2,340	3,018	297,012	1,275	1,801,725
2010	Mortgage debt (SEK thousand)	802	0	0	0	145	515	1,140	1,966	2,561	190,000	1,017	1,799,427
2011	Mortgage debt (SEK thousand)	861	0	0	0	157	553	1,229	2,100	2,732	176,943	1,118	1,784,598
2012	Mortgage debt (SEK thousand)	904	0	0	0	169	584	1,292	2,198	2,850	203,779	1,176	1,795,442
2013	Mortgage debt (SEK thousand)	944	0	0	0	178	610	1,350	2,283	2,964	294,637	1,246	1,801,725
2010	Credit card debt (SEK thousand)	4	0	0	0	0	0	3	12	21	554	10	1,799,427
2011	Credit card debt (SEK thousand)	5	0	0	0	0	0	4	15	25	814	12	1,784,598
2012	Credit card debt (SEK thousand)	5	0	0	0	0	0	4	15	27	1,384	14	1,795,442
2013	Credit card debt (SEK thousand)	5	0	0	0	0	0	4	16	28	3,213	14	1,801,725
2010	Other debts (SEK thousand)	40	0	0	0	0	0	35	127	197	85,000	179	1,799,427
2011	Other debts (SEK thousand)	42	0	0	0	0	0	36	134	207	100,000	177	1,784,598
2012	Other debts (SEK thousand)	43	0	0	0	0	0	36	137	212	95,726	180	1,795,442
2013	Other debts (SEK thousand)	41	0	0	0	0	0	35	137	213	90,069	177	1,801,725
2010	Total debt/Disposable income (%)	259	0	3	14	64	173	348	580	786	1,747	293	1,799,427
2011	Total debt/Disposable income (%)	257	0	3	13	65	177	352	573	764	1,669	283	1,784,598
2012	Total debt/Disposable income (%)	259	0	3	13	66	181	359	578	764	1,585	276	1,795,442
2013	Total debt/Disposable income (%)	263	0	3	12	67	185	365	584	772	1,618	281	1,801,725
2010	Mortgage debt/Disposable income (%)	242	0	0	0	48	161	334	562	760	1,657	285	1,799,427
2011	Mortgage debt/Disposable income (%)	241	0	0	0	51	165	337	554	739	1,578	275	1,784,598
2012	Mortgage debt/Disposable income (%)	244	0	0	0	53	169	344	560	739	1,509	269	1,795,442
2013	Mortgage debt/Disposable income (%)	249	0	0	0	54	174	351	568	751	1,555	275	1,801,725
2010	Credit card debt/Disposable income (%)	1	0	0	0	0	0	1	4	7	18	3	1,799,427
2011	Credit card debt/Disposable income (%)	1	0	0	0	0	0	1	4	8	20	3	1,784,598
2012	Credit card debt/Disposable income (%)	1	0	0	0	0	0	1	4	8	21	3	1,795,442
2013	Credit card debt/Disposable income (%)	1	0	0	0	0	0	1	4	8	21	3	1,801,725
2010	Other debts/Disposable income (%)	12	0	0	0	0	0	11	41	66	152	26	1,799,427
2011	Other debts/Disposable income (%)	12	0	0	0	0	0	11	40	66	152	26	1,784,598
2012	Other debts/Disposable income (%)	12	0	0	0	0	0	11	40	64	143	25	1,795,442
2013	Other debts/Disposable income (%)	11	0	0	0	0	0	10	39	62	130	24	1,801,725

Note. For each year, the values are revised as per 1 July. See Appendix 1 for a definition of the variables. Total debt refers to the sum of the balances of all individual types of loan. Mortgages refers to loans against real estate or against collateral in tenant-owned apartments. Credit card debt refers to debts from credit cards and debit cards. Other debts refers to total debts minus mortgages and credit card debts. For the variables "total debt/disposable income", "mortgage/disposable income", "credit card debt/disposable income" and "other debts/disposable income", extreme values have been managed as described in Appendix 2. Amounts are expressed in SEK thousands, which means that the zeros in the minimum values for incomes and total debts are less than SEK 500 but greater than zero.

Source: The Riksbank

Table 8. Descriptive statistics for households with mortgages

YEAR	VARIABLE	Households with mortgages											NUMBER OF HOUSEHOLDS
		AVERAGE	MIN	P5	P10	P25	MEDIAN	P75	P90	P95	MAX	STD	
2010	Disposable income (SEK thousand)	378	0	112	153	232	354	465	600	718	324,340	452	1,480,338
2011	Disposable income (SEK thousand)	399	0	119	162	246	375	492	637	762	411,280	465	1,474,982
2012	Disposable income (SEK thousand)	412	0	122	166	252	384	506	657	788	320,907	495	1,490,815
2013	Disposable income (SEK thousand)	422	0	125	171	258	394	520	673	804	381,654	478	1,498,324
2010	Total debt (SEK thousand)	1,012	0	104	173	357	722	1,365	2,188	2,800	190,000	1,070	1,480,338
2011	Total debt (SEK thousand)	1,084	0	110	182	379	771	1,467	2,338	2,988	177,656	1,186	1,474,982
2012	Total debt (SEK thousand)	1,131	0	113	189	395	806	1,527	2,432	3,099	263,514	1,253	1,490,815
2013	Total debt (SEK thousand)	1,177	0	117	196	410	846	1,592	2,518	3,210	297,012	1,318	1,498,324
2010	Mortgage debt (SEK thousand)	975	0	98	158	333	684	1,320	2,130	2,731	190,000	1,043	1,480,338
2011	Mortgage debt (SEK thousand)	1,042	0	100	167	351	730	1,415	2,280	2,909	176,943	1,151	1,474,982
2012	Mortgage debt (SEK thousand)	1,088	0	102	173	367	763	1,481	2,375	3,009	203,779	1,210	1,490,815
2013	Mortgage debt (SEK thousand)	1,135	0	106	180	384	800	1,537	2,465	3,142	294,637	1,285	1,498,324
2010	Credit card debt (SEK thousand)	3	0	0	0	0	0	1	10	19	554	10	1,480,338
2011	Credit card debt (SEK thousand)	4	0	0	0	0	0	3	13	24	814	12	1,474,982
2012	Credit card debt (SEK thousand)	5	0	0	0	0	0	3	14	26	1,188	13	1,490,815
2013	Credit card debt (SEK thousand)	5	0	0	0	0	0	3	15	26	987	13	1,498,324
2010	Other debts (SEK thousand)	34	0	0	0	0	0	18	110	181	85,000	150	1,480,338
2011	Other debts (SEK thousand)	37	0	0	0	0	0	20	120	197	100,000	170	1,474,982
2012	Other debts (SEK thousand)	38	0	0	0	0	0	21	125	202	95,726	179	1,490,815
2013	Other debts (SEK thousand)	37	0	0	0	0	0	20	126	205	80,295	161	1,498,324
2010	Total debt/Disposable income (%)	310	0	36	57	114	221	395	630	850	2,057	317	1,480,338
2011	Total debt/Disposable income (%)	307	0	37	58	116	224	396	619	824	1,954	304	1,474,982
2012	Total debt/Disposable income (%)	308	0	37	59	118	229	402	622	818	1,842	293	1,490,815
2013	Total debt/Disposable income (%)	313	0	37	59	120	234	408	628	830	1,879	298	1,498,324
2010	Mortgage debt/Disposable income (%)	299	0	33	53	107	210	383	614	827	1,987	309	1,480,338
2011	Mortgage debt/Disposable income (%)	295	0	33	53	108	213	383	601	800	1,881	295	1,474,982
2012	Mortgage debt/Disposable income (%)	296	0	33	54	110	218	389	605	796	1,776	285	1,490,815
2013	Mortgage debt/Disposable income (%)	302	0	33	55	112	223	395	613	810	1,831	292	1,498,324
2010	Credit card debt/Disposable income (%)	1	0	0	0	0	0	0	3	6	15	2	1,480,338
2011	Credit card debt/Disposable income (%)	1	0	0	0	0	0	1	3	6	17	3	1,474,982
2012	Credit card debt/Disposable income (%)	1	0	0	0	0	0	1	3	7	19	3	1,490,815
2013	Credit card debt/Disposable income (%)	1	0	0	0	0	0	1	4	7	18	3	1,498,324
2010	Other debts/Disposable income (%)	9	0	0	0	0	0	5	32	54	129	22	1,480,338
2011	Other debts/Disposable income (%)	9	0	0	0	0	0	6	33	56	133	23	1,474,982
2012	Other debts/Disposable income (%)	9	0	0	0	0	0	6	33	56	129	22	1,490,815
2013	Other debts/Disposable income (%)	9	0	0	0	0	0	5	33	55	119	21	1,498,324

Note. For each year, the values are revised as per 1 July. See Appendix 1 for a definition of the variables. Total debt refers to the sum of the balances of all individual types of loan. Mortgages refers to loans against real estate or against collateral in tenant-owned apartments. Credit card debt refers to debts from credit cards and debit cards. Other debts refers to total debts minus mortgages and credit card debts. For the variables "total debt/disposable income", "mortgage/disposable income", "credit card debt/disposable income" and "other debts/disposable income", extreme values have been managed as described in Appendix 2. Amounts are expressed in SEK thousands, which means that the zeros in the minimum values for incomes, total debts and mortgages are less than SEK 500 but greater than zero.

Source: The Riksbank