M E M O R A N D U M

Date 2013-10-01
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Risks to financial stability and individual households in Sweden associated with household indebtedness and amortisation behaviour

Summary analysis of the work of the Analysis Group:

The Analysis Group has conducted a number of analyses using microdata of both existing borrowers and new borrowers with a focus on observed loan-to-value ratios and amortisation behaviour. These analyses indicate that households *in general* have a strong repayment capacity and that the risks are low for most individual households even in stressed situations. The analyses also indicate that there is a low risk that the banks will incur large credit losses from mortgages. However, the analyses of the microdata do indicate that some groups of households are very vulnerable to a drop in income and/or house prices. *As a whole,* the analyses that have been conducted *exclusively on microdata* indicate that the risks to the financial system are *currently* limited.

Since the mortgage cap was implemented in 2010, repayment periods for top and unsecured loans for new borrowers have decreased, and the trend of rising loan-to-value ratios appears to have been broken. However, repayment periods on bottom loans are very long, which is holding up the aggregate debt ratio. At the same time, new calculations based on the mortgage survey's panel data from 2011 and 2012 are showing that *net* amortisation (i.e. *gross* amortisation minus new loans) was negative for new borrowers between the autumn of 2011 and 2012; loans to the households that were present in the dataset both years increased by 11 per cent during the period. If this behaviour continues among new borrowers, it could mean that the current rate of increase in households' *total* housing debts of around 5 per cent a year may rise in the future. This would then mean that the aggregate debt ratio would most likely continue to rise, all else held equal. In terms of the risk of financial instability, it is positive that repayment periods on top and unsecured loans are decreasing. The long repayment periods on bottom loans and the negative net amortisation among new borrowers, however, can contribute to an increase in the risks in the future.

The analyses of the macrodata *indicate* that fundamental real demand and supply factors, primarily lowered interest rates, lowered taxes and increased home ownership, can explain a large part of the upswing in the aggregate debt

ratio of households in Sweden over the past 10-15 years. This *can* indicate that the risk of a negative macroeconomic development and financial instability similar to that we have seen in other countries where the aggregate debt ratio has also increased sharply is less pronounced in Sweden. At the same time, it is not possible to rule out that more generous norms for granting credit *in and of themselves* may have also contributed to some extent to the upswing; the loan-to-value ratio for new loans increased from approximately 60 to 70 per cent between 2003 and 2010. The average loan-to-value ratio in the stock of mortgages is 65 per cent.

Even if fundamental factors are judged to explain the upswing in the debt ratio, there is a risk that these factors may change, or that households have incorrect expectations about these factors, and that this can lead to major problems for the macroeconomic situation and the financial system. We could also find ourselves in an economic situation where negative factors trigger one another and where confidence in the Swedish economy in general falls. This could, for example, trigger a sharp fall in housing prices. In such a situation there is a risk that households would drastically reduce their consumption, which could lead to credit losses in the banks' lending to non-financial firms. A sharp fall in housing prices could also have a serious effect on the banks' funding situation. In the event of an economic development in which negative factors trigger one another - a situation that is difficult to fully capture in the analyses, simulations and calculations made by the Analysis Group - the consequences of a high aggregate debt ratio and a continuously rising debt ratio could become more dramatic. Therefore, one should not dismiss risks solely on the grounds that fundamental factors are estimated to explain the growth in debts and housing prices.

Decisions about potential new measures to decrease the risks related to household indebtedness, by necessity, must be made based on an *uncertain overall assessment*. *Prudence* would indicate that there is good reason to *consider* additional measures relatively quickly in order to handle the risks of today's historically and from an international perspective high aggregate debt ratio, even if the "solid evidence" that serves as a basis for the decisions is limited. The basis for these measures should therefore be that the *potential* economic costs of not taking action today *are judged* to be so large that they outweigh the costs of increased regulation. At the same time, it is important for potential new measures to be designed in such a manner that when implemented they do not contribute *themselves* to a downturn in the economy. It is also important to continue to analyse if there are grounds for taking additional measures to protect particularly exposed household groups, even if the risks in the lending to these groups *when considered on their own* are not judged to represent a major threat to financial stability.

Note: *The underlying memoranda that serve as a basis for this summary of the work by the Analysis Group will be published as they are finalised.*

Introduction

Developments on the housing market have historically played a prominent role in financial crises. Often, countries which before the crisis had sharply rising housing prices and increasing debt among households are hardest hit in terms of e.g. falling housing prices, disruptions in the financial system, rising unemployment and problems with public finances. The Swedish crisis in the 1990s and the most recent global crisis are just two examples of this. However, it is also important to note that it is not necessarily always rising housing prices or high indebtedness that caused these crises, but once the crises had occurred, they were magnified because of these factors.

To date, Sweden has been able to handle the financial crisis that started in 2008 relatively well compared to many other countries, even if unemployment has increased significantly and GDP-growth has fallen. In contrast to many other countries, the financial crisis has not resulted in large falls in housing prices in Sweden, but this does not mean that there are not any risks related to both housing prices and the households' debt levels.

Housing prices in Sweden increased sharply (145 per cent) between 1995 and 2010. At the same time, household indebtedness also increased significantly. From a historical perspective, we currently have very high levels of debt among households in relation to their disposable income (around 170 per cent). The average loan-to-value ratio for new loans increased from around 60 per cent to 70 per cent between 2003 and 2010. The average (contractual) repayment periods for loan-to-value ratios under 75 per cent are very long, and a large share of the new borrowers have unamortised loans. Even if the households' current interest rate expenses in relation to their disposable income are relatively low and several investigations show that the rise in housing prices can be explained to a large extent by fundamental factors, the high level of debt and long repayment periods represent a risk for the future that requires closer analysis.

Given this background, it was decided at the Council for Cooperation on Macroprudential Policy's meeting on 19 February that a joint Analysis Group should be appointed by Finansinspektionen and the Riksbank in order to more closely analyse the risks associated with the households' indebtedness and amortisation behaviour. The analysis can be viewed as a complement to the inquiry conducted by the Riksbank in 2011 into the risks in the Swedish housing market[1] and Finansinspektionen's most recent mortgage survey[2].

[1] See the Riksbank's inquiry into the risks in the Swedish housing market, Sveriges Riksbank, 2011.
[2] See The Swedish Mortgage Market 2013, Finansinspektionen.

Assignment of the Analysis Group

The Analysis Group was given the assignment of presenting a detailed description of the households' *current* indebtedness and amortisation behaviour and analysing if some households are specifically problematic in this respect. The Analysis Group was also given the assignment of analysing both the short- and long-term consequences of different amortisation behaviour on the households' indebtedness, primarily which risks would arise for both *individual households* and *financial stability*. Finally, the Group also received an assignment to map international experiences related to the households' indebtedness and analyse the relevance of these experiences given Swedish conditions. The Group was *not* assigned the task of proposing potential measures. The main goal has been to analyse the risks related to the households' indebtedness and amortisation behaviour.

The analysis has been limited in that wealth data at the individual level has not been available since 2007. In order to be able to assess the risks associated with a high level of debt, the households' debts should ideally be placed in relation to the households' wealth. In order to assess the households' resilience, for example, to a fall in housing prices, it is also important to know how much of the households' wealth is liquid. A limited analysis of aggregate data was conducted as part of the assignment and some references have been made to the analysis that was already conducted on older individual wealth statistics.

Structure of the work

Based on the assignment from the Council for Cooperation on Macroprudential Policy, the Analysis Group decided to produce eight different memoranda in addition to a summary analysis in which the Analysis Group's chair summarises the main conclusions of these eight memoranda. The following memoranda were prepared in addition to the summary analysis. They will be published at a later date as they are finalised (responsible institution in parentheses):

Memorandum 1. Explanations for the development in the households' debt since the mid-1990s
(Finansinspektionen)

The purpose of this memorandum is to try to identify possible explanations for the upswing in households' *aggregate* debt to date. In order to be able to assess the seriousness of a high level of indebtedness moving forward, it is important to first identify if there are fundamental factors that can explain the upswing to date, what these factors are and what this can mean for the risks.

Memorandum 2. Analysis of the distribution of the households' debt
(Finansinspektionen)

The risks of a certain *aggregate* debt in society can differ depending on how the debts are *distributed*. The purpose of this memorandum is to expand the analysis of the dataset from the mortgage survey and even supplement the analysis with information from Statistic Sweden's annual cross-section survey, HEK (Household Finances), in order to increase awareness of how household debts are distributed. The memorandum uses the mortgage survey to show the distribution among *new* borrowers while HEK is used to gain an understanding of the distribution in the *entire* population. The data is also analysed based on different income and age groups, and it is also broken down into regions. The memorandum also presents different stress tests based on both the mortgage survey and the HEK data to see which household categories are particularly exposed to increases in interest rates, loss of income as a result of unemployment and a fall in housing prices, as well as to determine what this can mean for the banks' credit losses directly linked to mortgages.

Memorandum 3. Households' current loan-to-value ratios and amortisation behaviour in Sweden
(Finansinspektionen)

The purpose of this memorandum is to analyse households' current loan-to-value ratios (i.e. debt in relation to the market value of the home) and amortisation behaviour using the most recent mortgage survey. In order to be able to assess the risks associated with the loan-to-value ratios and amortisation of new loans, it is important to also be able to distinguish between the households' gross and net amortisation. Net amortisation is defined as the amortisation of existing loans during a year (gross amortisation) minus any new loans raised during the year. If households tend to raise new loans during the year that are larger than the sum of the amortisation on existing loans, net amortisation is negative. The memorandum uses panel data in the mortgage survey covering two years to gain a rough understanding of the households' net amortisation.

Memorandum 4. Households' amortisation decisions
(Riksbank)

The purpose of this memorandum is to identify what kind of guidance economic theory provides about households' amortisation decisions. A sub-purpose of this memorandum is also to determine if there is incentive from an *individual's* perspective not to amortise, which ultimately can conflict with the risks that may arise at the *aggregate* level regarding macroeconomics and financial stability if many households abstain from amortising or only amortise a little (see more in Memorandum 6).

Memorandum 5. Future risks for *individual* households given current loan-to-value ratios and amortisation behaviour
(Finansinspektionen)

This memorandum supplements the more theoretical analysis presented in Memorandum 4 and the statistical analysis in Memorandums 2 and 3 with *long-term projections/simulations* of the financial situation of several different categories of households with regard to loan-to-value ratios, debt ratios and interest rate ratios. In addition, calculations and projections are made of the discretionary income that these different household categories have left after paying for housing costs, interest rate costs and other subsistence costs. The projections are first made using a *basic scenario*, which uses the loan-to-value ratios and amortisation behaviour that can be observed on new loans in the 2012 mortgage survey (also described in Memorandum 3) given certain assumptions about e.g. the interest rate level, future growth of the households' disposable income and housing prices. An analysis is then conducted of how the conclusions are affected if the various assumptions are changed. The discretionary income calculations are based in part on *necessary* costs and in part on Statistic Sweden's HUT data, which instead shows *actual* consumption expenditure for different household categories.

Memorandum 6. Risks to the macroeconomy and financial stability arising from the development in the households' debts and housing prices
(Riksbank)

The aim of this memorandum is to assess the short-term and long-term risks to the macroeconomy and financial stability that are associated with high *aggregate* debt. Even *if* the *individual* risks of high individual indebtedness and low amortisation were limited for the majority of households, there can be significant risks to the macroeconomy and financial stability in a situation of high *aggregate* debt, which can indirectly pose a significant risk for the housing sector as a whole. Experience shows, for example, that an economic recovery can be extremely drawn out if a country that has been exposed to a major disruption in its business cycle has a high level of debt. This is evident in particular if the disruption also results in a fall in housing prices. If households are heavily indebted, there is a risk that they will reduce their consumption more than they would have done otherwise to restore their balance-sheets. This leads to a more negative effect on economic activity and unemployment than would otherwise be the case, which indirectly can also influence financial stability.

Memorandum 7. Consequences of higher future aggregate debt on the funding of mortgages with covered bonds
(Riksbank)

The banks currently fund around 75 per cent of their issued mortgages with covered bonds. The remainder (25 per cent) is funded by unsecured borrowing, of which the majority consists of deposits from the general public. A covered

bond means that the bank issues a mortgage bond collateralised by existing housing credits (existing housing credits are an asset for the bank). A covered bond is thus linked to this so-called cover pool. There are special rules regarding how this cover pool must be designed, for example the maximum acceptable loan-to-value ratio of loans included as collateral in the cover pool. The loan-to-value ratio regarding mortgages in the cover pool may not exceed 75 per cent. The average loan-to-value ratio in the mortgage stock is currently around 65 per cent. A trend of a rising average loan-to-value ratio in the mortgage stock can mean that the banks will find it more difficult to fund mortgages using covered bonds, primarily if housing prices were to fall sharply following an upswing in the average loan-to-value ratio. The purpose of this memorandum is to use different scenarios for the average loan-to-value ratio to assess the consequences for the banks' possibilities for funding mortgages via covered bonds.

Memorandum 8. Households' debt ratio in Sweden from an international perspective
(Finansinspektionen)

In order to gain an additional basis on which to assess the risks associated with high indebtedness in Sweden, there are strong reasons for comparing the development of debt in Sweden with the development of debt in other countries, in particular in countries that have had problems after longer periods of rising housing prices and household debt but also in comparable countries. The purpose of this final memorandum, therefore, is to investigate similarities to and differences from the development in other countries as guided by the conclusions in Memorandum 1.

Conclusions

Fundamental real demand and supply factors are judged to explain a large part of the upswing in the households' aggregate debt ratio…

The upswing in the households' aggregate debt ratio in recent years is judged in Memorandum 1 to be explained to a large extent by higher home ownership, lower interest rates, lower taxes and a later entrance into the labour market. The assessment in Memorandum 1's basic scenario is that these factors can explain a large part of the upswing in the debt ratio the decade before the break-out of the financial crisis in 2008/2009. However, this assessment is uncertain since it is based on some assumptions and it was not possible to conduct a formal causality test. When using other assumptions it is possible to reach the conclusions that these factors only can explain a little more than half of the upswing in the debt ratio or that they can explain *more* than the entire upswing in the debt ratio. The total *assessment* is still that the upswing in the debt ratio in recent years to a large extent is probably explained by structural factors. This is also supported by the presence of other factors that indicate the same conclusion but that could not be quantified, primarily the price and debt

effect of urbanisation and the limited production of new homes in relation to the rate at which people are moving into growing regions.

…but more generous norms for granting credit may also have played a role

The question is also if more generous norms for granting credit *themselves*, in the form of increasing loan-to-value ratios and a greater representation of unamortised loans over time, contributed to the upswing in the debt ratio. *Theoretically*, unamortised loans should not have a major effect on housing prices or indebtedness *if* households are rational and not credit-rationed. The loan will always be paid back regardless of whether this occurs over the term of the loan or in conjunction with a sale of the home. Unamortised loans undoubtedly decrease monthly *expenditure*, which makes it possible to take on more debt without increasing the monthly expenditure, but at the same time the present value of the interest rate *costs* of the loan increase over the term of the loan. Amortisation is nothing more than a form of savings and variations in amortisation in theory are only a redistribution of the savings portfolio. In practice, however, there is a risk that households have a more short-term focus and instead are primarily looking at their total monthly expenditure. If this is the case, a switch from (an intended) amortisation requirement to unamortised loans can lead to households borrowing more than they would otherwise, which in turn also can raise housing prices. The effect of this on the debt ratio, however, is not entirely easy to quantify. It has not been possible to show if higher loan-to-value ratios and a higher degree of unamortised new loans over time *in and of themselves* have *contributed* to a higher debt ratio or if the new norms for granting credit only *enabled* the upswing in the debt ratio that can be explained by structural demand and supply factors. Given the assessment in one of the alternative calculations in Memorandum 1, where there is an unexplained upswing in the debt ratio, one interpretation could be that more generous norms for granting credit in part would have *contributed* to the unexplained upswing in the debt ratio. In the calculations where structural factors explain the entire upswing in the debt ratio, the assessment becomes that more generous norms for granting credit rather has *enabled* (but not contributed to) the upswing.

The debt ratio has followed an upward trend in all income groups and some household groups are very vulnerable

As stated above, the risks of a certain *aggregate* debt level in society can differ depending on how the debts are *distributed*. The HEK data analysed in Memorandum 2 shows that the debt ratio followed an upward trend for more or less all of the income groups at the same time as the aggregate debt ratio went up. This increase has been largest for households with low and high disposable income. The analysis also shows that all income groups in new lending have significantly higher debt ratios compared to the stock.

In order to be able to assess the risks associated with the higher debt ratios, a study should also be conducted of how large a share of the households' debts is

from households with the lowest incomes and specifically households that collect part of their income from the social welfare system. The analysis in Memorandum 2 shows that a relatively small share of the outstanding debt is held by vulnerable households. Around four per cent of the outstanding debt is held by households with low income or that have received unemployment or sickness benefits and do not have income to cover interest rate payments and other subsistence costs. However, the share of the total debt held by households with the lowest disposable income decreased between 2005 and 2011. The mortgage survey also shows that of the new loans that were granted a relatively small share was granted to households with disposable income under SEK 15,000.

The analysis in Memorandum 2 shows at the same time that 2.6 and 8 per cent, respectively, of the new and existing borrowers do not have sufficient income to cover interest rate payments and other subsistence costs. In addition, every tenth existing borrower has less than SEK 3,000 in discretionary income each month. The corresponding percentage among new borrowers is 9 per cent. Fifteen per cent of the households' total debt is held by households that have less than SEK 3,000 in discretionary income every month after paying for housing and subsistence costs. The corresponding percentage for new borrowers only is just under 6 per cent. This means that there are quite a number of households with very small margins in their finances. This is a cause of worry for the affected households, but *on its own* it is not considered to represent a threat to financial stability. At the same time it is not possible to rule out that if these risk groups experience extensive payment problems in conjunction with a drawn-out economic downturn it could affect confidence in the banking system, which could lead to contagion effects. However, Memorandum 2 shows, just like in Finansinspektionen's most recent mortgage survey, that the majority of the total volume of loans is held by households that are judged to have strong repayment capacity.

The analysis in Memorandum 2 also shows that the loan-to-value ratios in general are higher in smaller towns compared to the major cities, but that despite this the debt ratios are higher in the major cities. This can be explained by the fact that housing prices in relation to disposable income are higher in the major cities. The analysis in Memorandum 2 that is based on the HEK data also shows that 4 per cent of the total debt has "moved" from smaller towns to major cities over the past decade, probably as a result of urbanisation.

In order to be able to fully assess the risks associated with a high level of debt, the households' debts should ideally be placed in relation to the households' wealth. Since the wealth tax was eliminated in 2007, there is no data about the wealth of individuals. Previous data at the individual level shows that households with the highest debts also had the highest wealth, that this wealth on average was roughly three times the size of the debts and that this relationship was relatively stable over time. Aggregate data shows that the households' total wealth in 2012 was also three times larger than the debts and that the households' liquid assets were approximately at the same level as the

debts. *Taken on its own,* this implies that the households have relatively large buffers even in the event of a large fall in housing prices.

The risk of major credit losses on mortgages is assessed to be small based on microdata

Even though the debt ratio has increased in recent years, both in aggregate and for all income groups, the risk for major credit losses on mortgages is judged to be small. Memorandum 2 presents the results of the stress tests Finansinspektionen conducted in accordance with the most recent mortgage survey. The results show that the households that raised a new mortgage are demonstrating strong repayment capacity and in general have good resilience against increases in the interest rate, loss of income due to unemployment and a fall in housing prices. Stress tests conducted on the HEK data also show that the households in the population in general that have debt have good resilience to increases in the interest rate.

Even if the households that experience increases in the interest rate, a loss of income and a fall in housing prices are forced to make adjustments to their finances, the assessment based on the microdata is that financial stability is currently not threatened in that the banks would risk major credit losses on mortgages. One reason why relatively low credit losses on mortgages are expected in the event of a fall in housing prices is that homeowners in Sweden are personally responsible for their debts. This means that households, in contrast, for example, to the USA, cannot walk away from the loan by simply turning the house over to the bank if the market value of the house falls below the amount of the mortgage. Despite the fact that housing prices fell sharply by 30 per cent at the beginning of the 1990s and there was a pronounced increase in unemployment, the banking sector had limited credit losses on mortgages. On the other hand, the banks did suffer major credit losses on lending to non-financial firms.

Trend of rising loan-to-value ratios appears to have been broken

Memorandum 3 shows, through a reference to Finansinspektionen's most recent mortgage survey, that the trend of steadily rising loan-to-value ratios in new lending appears to have been broken. Households' average loan-to-value ratio for new loans raised during the autumn of 2012 was around 70 per cent, the same level as in the survey the year before. This is a positive development since a loan-to-value ratio that continues to rise makes borrowers more vulnerable to situations where housing prices fall at the same time as the borrowers need to sell their home. Households with new loans have, on *average*, a 30 per cent buffer in the event of a fall in housing prices. In the stock the average loan-to-value ratio is 65 per cent, so the average margin there is a bit larger than in new lending.
Data also shows that after the implementation of the mortgage cap there has been a clear downturn in the share of households that raise new loans with loan-to-value ratios exceeding 85 per cent (unsecured loans), which indicates

that the mortgage cap has had a positive effect. Currently, only around one out of ten households raises new loans with a loan-to-value ratio in excess of 85 per cent. This can be compared to before the implementation of the mortgage cap when 20 per cent of the new borrowers raised loans with a loan-to-value ratio in excess of 85 per cent.[3]

Trend toward higher amortisation on top and unsecured loans, but very long repayment periods on bottom loans and negative net amortisation among new borrowers

All households which in the most recent mortgage survey's sample have a loan-to-value exceeding 85 per cent amortise their loans with an average repayment period of 9.5 years (down to a loan-to-value ratio of 85 per cent). Of the households with a loan-to-value ratio exceeding 75 per cent, 88 per cent amortise their loans. The average repayment period for loan-to-value ratios between 76 and 85 per cent (i.e. top loans) is 12.5 years. These numbers are also in line with the numbers the banks give in the terms and conditions of their loans. However, the repayment period on bottom loans is very long. The repayment period in the sample for households with loan-to-value ratios below 75 per cent, and that actually amortise their loans, is on average 130 years based on the annual amount that is actually amortised (measured as an unweighted average). At the same time, 43 per cent of the households have unamortised loans. If all of the unamortised loans are included and the assumption is made that borrowers amortise the same volume in SEK on these loans as on those that are actually being amortised, the average repayment period in the stock rises to 148 years. These numbers are significantly higher than the average repayment periods on bottom loans that the banks give in the terms and conditions of their loans. In practice, however, the actual repayment periods are never this long since the loans are settled when the homes are sold. According to Statistics Sweden, on average 5.6 per cent of all single-family dwellings, holiday homes and tenant-owned apartments were sold every year during the period 2000-2012. This gives an average holding time − and maximum repayment period on the loan − of just under 18 years. At the same time, new loans are raised when the homes are sold. However, there are (previous) analyses that show that first-time buyers have a significantly higher loan-to-value ratio than people who are buying their second, third home, etc.

One positive factor based on the risk that unamortised loans pose to financial stability is that the (new borrowers) who raise unamortised loans as a rule have a significantly lower loan-to-value ratio than those who amortise (64 per cent compared to 78 per cent).

Even if the households' amortisation behaviour, with regard to new borrowers, has improved in terms of the terms of the agreement, this does not mean that

[3] One potential error source in the dataset, however, is that it is not possible to see if a household has raised an unsecured loan in a different bank than the one where the bottom and top loans have been raised.

the households' *net* amortisation is positive. New calculations based on the mortgage survey's panel data from 2011 and 2012 show that *net* amortisation (i.e. *gross* amortisation minus new loans) was negative for new borrowers between the autumn of 2011 and 2012; loans for the households that were present in the dataset for both years increased by 11 per cent during the period despite positive *gross* amortisation. If this behaviour continues among new borrowers, it could mean that the current rate of increase in households' *total* housing debts of around 5 per cent a year may rise in the future. This would then mean that the aggregate debt ratio would most likely continue to rise, *all else held equal*. In terms of the risk of financial instability, it is positive that repayment periods on top and unsecured loans are decreasing. The long repayment periods on bottom loans and the negative net amortisation among new borrowers, however, can contribute to an increase in the risks in the future.

From the perspective of the individual household, it can be rational to both amortise and not amortise

Memorandum 4 shows that economic theory (life cycle hypothesis) implies that it can be optimal for an *individual* household to have a high loan-to-value ratio and low amortisation at the beginning of its professional career when income is low and less than the household's desired consumption level. According to the theory, households strive to spread consumption out over time. It can also be rational for households not to amortise after retirement since incomes once again fall. However, the theory assumes that older households have lower loan-to-value ratios than younger households since they save in the middle of their life cycle when income exceeds the household's desired consumption level.

Viewed over longer holding periods, the risks associated with low amortisation are normally small from the individual household's perspective…

Memorandum 5 uses stylized calculations to analyse whether current loan-to-value ratios and amortisation behaviour on new loans introduce risks for any Swedish household groups over a longer period of time. By assuming that housing prices increase annually by 2 per cent and disposable income by 4 per cent, a calculation is made of how the loan-to-value ratio, debt ratio, interest rate ratio and discretionary income develops in the long term for four different types of households: an average household, a young family with children, a young single person, and a couple close to retirement age. Average "start values" for the different types of households and the variables were taken from the sample in Finansinspektionen's most recent mortgage survey (which includes new loans raised over a nine-day period during the autumn of 2012). The calculations are made both with an assumption of unamortised loans and an assumption that the different household types amortise in accordance with the average amortisation behaviour observable in Finansinspektionen's sample for each type.

The calculations show that risk associated with low amortisation is small from the perspective of the individual household when viewed over longer holding periods under reasonable assumptions of annual growth in housing prices and disposable income. The loan-to-value ratios both with and without amortisation may be considered to be low at the end of the holding periods for all types of households. The debt ratio is initially high for three of the four analysed household types, but given the assumed annual increase in disposable income, the debt ratio falls relatively quickly over time. On the assumption that the households are not exposed to stresses in the form of a fall in housing prices, interest rate increases or unemployment, the calculations as a whole do not demonstrate any obvious risks associated with low amortisation for individual consumers *when viewed over a long period of time*. This also applies when taking into consideration that disposable income falls sharply for households that enter into retirement. However, if annual growth in housing prices and disposable income is lower than what has been assumed in these calculations, the risks increase.

… but the risks are significantly larger in the short term

In the short term the risks of high loan-to-value ratios and low amortisation in stressed situations can also be significantly larger. Households starting with a high loan-to-value ratio can be hit hard if they are exposed to disruptions such as a fall in housing prices and loss of income shortly after being granted the loan. A young, single borrower is extremely vulnerable and risks having a deficit in his/her discretionary income if he/she becomes unemployed. This deficit becomes significantly higher if it is based on actual consumption expenditure instead of only necessary expenditure, which indicates that households would be forced to make major adjustments to their finances. If unemployment would coincide with a fall in housing prices, this could result in the borrower being forced to sell his/her home at a loss and thereby take on an outstanding debt. Experiences from the major fall in housing prices in Sweden at the beginning of the 1990s show that the households which then had high loan-to-value ratios still owned homes with market values below the value of the loans collateralised by the home several years after the housing prices fell. One purpose of the mortgage cap is specifically to decrease this risk. This risk also implies that it is important to have a relatively fast amortisation rate on loans with high loan-to-value ratios.

At the same time, it should be noted that other financial saving by households can fill the same function as saving in the form of amortisation. However, it is most likely difficult to find a form of risk-free saving with a higher return than the interest rate the household saves by amortising, given that a mortgage has already been raised. Amortisation on an existing mortgage is completely risk-free saving.

… and even when taking into consideration how high aggregate debt can affect the macroeconomy

Even if structural factors in Memorandum 1 are judged to be able to explain a large part of the upswing in the aggregate debt ratio in recent years, and the risks associated with high loan-to-value ratios and low amortisation in Memorandums 2 and 5 are judged to be small for the majority of the households, this does not mean that the upswing in the debt ratio does not constitute a risk for the macroeconomy and financial stability. In a situation of sharply falling housing prices, there is a risk that the real economy will be affected more if the households are heavily indebted compared to if they were less indebted since the downturn in private consumption can be more pronounced if debt levels are high. Memorandum 6 illustrates how the composition of the households' balance sheets (assets and liabilities) can influence the effect that a high level of debt can have on the economy. In one example, it is shown that if the households were to compensate the entire increase in the level of indebtedness (financial liabilities over real liabilities plus financial assets) in the event of a fall in housing prices by reducing consumption expenditure, the negative effects on the economy risk being significantly larger in the presence of high debt levels than low debt levels. Even though consumption effects from changes in housing prices are normally relatively small, the example clearly shows the risks that can be associated with a high level of debt.

… and financial stability from a loss of confidence and credit losses on lending to non-financial firms

If private consumption were to fall sharply as a result of a high level of debt following a fall in housing prices, there is a risk that the stability of the financial system could be affected. Even if the risk of credit losses on mortgages is small, there are other channels through which falling housing prices can affect financial stability.

First, in a situation where housing prices and private consumption are both falling sharply, general confidence in the Swedish economy as a whole and thereby also the financial system can be affected. After a longer period of small credit losses in the banks, there is a risk in such a situation that even smaller credit losses could be perceived as a larger incipient risk.

Second, in such a situation the banks could post large credit losses in their lending to non-financial firms, even if the risk for the banks posting large credit losses on mortgages is judged to be small. It is not possible to rule out that a fall in housing prices on its own or in combination with a loss of income reduces demand among non-financial firms. Memorandum 6 illustrates that this could result in a larger number of bankruptcies and thereby larger credit losses in the banks' lending to non-financial firms.

…and taking into consideration the risk for problems with funding via covered bonds

Third, a situation in which housing prices are falling sharply can make it more expensive and, in a worst case scenario, more difficult to fund mortgages with covered bonds. Memorandum 7 makes several calculations to attempt to assess the risks associated with such a development.

The average loan-to-value ratio today is around 65 per cent in the stock and around 70 per cent in new lending. Given the current repayment periods and loan-to-value ratios in new lending, the assessment, under certain assumptions, is that the loan-to-value ratio will reach 69 per cent in 10 years in the stock. This means that there is a buffer to the 75 per cent limit in the cover pool. If consideration is also given to the fact that the average surplus value in Swedish banks' cover pools in the second quarter of 2013 is around 36 per cent, housing prices, all else held equal, can fall quite far before any major problems arise with regard to funding mortgages with covered bonds. If, for example, housing prices were to fall 20 per cent in the next 10 years, the average loan-to-value ratio in the mortgage stock would increase to around 87 per cent. This would mean that parts of mortgages that exceed 75 per cent would need to be removed from the cover pool. An estimate shows that in such a situation the surplus value would be reduced by around one-third. In order for a credit rating agency to give a credit score of AAA, as a rule the underlying collateral must exceed the value of the outstanding bonds by around 15 per cent. This also means that a fall in housing prices of 20 per cent would still leave the Swedish banks with a buffer in relation to the limit for the AAA score. Even though a downgrade would most likely not occur in such a situation, it is not possible to rule out negative market reactions to such a large fall in housing prices since market participants often demand a buffer to the requirements placed on institutions and instruments by regulations. The consequences could be more dramatic if the loan-to-value ratios in the mortgage stock were to continue to climb upward in the coming years and/or if housing prices were to fall more than 20 per cent, and in particular since a large fall in housing prices probably would not be an isolated incident but rather coincide with other negative events in the economy, such as reduced confidence in the Swedish economy in general.

Households' aggregate debt ratio in Sweden has increased similarly as that in several countries in crisis, but partly different explanations to the increase are judged to make the risks for a similar development as in the crisis countries lower in Sweden

Memorandum 8 shows that the Swedish households' aggregate debt ratio the years before the financial crisis increased in a similar manner to that of several countries which were hit hard by the financial crisis in terms of, for example, a sharp increase in unemployment and falling housing prices. It is difficult to determine what can explain the developments in the debt ratio in different countries without fully taking into consideration all of the country-specific

factors that could have played a role. The time limitations on the work of the Analysis Group has not made such an extensive analysis possible. Instead, the basis for the analysis in Memorandum 8 has been to analyse if the factors that in Memorandum 1 are judged to explain large parts of the upswing in the aggregate debt ratio in Sweden can also to a large extent explain the development in the debt ratio in both countries that are similar to Sweden and countries that were hit hard by the financial crisis. Several other conceivable factors are also considered but in a much more limited form. The development in Sweden is compared to that in Finland, the Netherlands, Denmark, Ireland and Spain.

In Memorandum 1, the upswing in the households' aggregate debt ratio in recent years to a large extent can be explained by increased home ownership, lower interest rates, lower taxes and a later entrance into the labour market. Memorandum 8 does not judge these factors to be able to equivalently explain the upswings in the debt ratios in other countries. Some similarities are found with the Netherlands, where an increase in home ownership contributed to an upswing in the debt ratio. The situation in Ireland and Spain cannot not be explained by increased home ownership, lower housing taxes or lower interest rates. The development in these two countries can most likely instead be explained by demographic factors, high economic activity, for example in housing production, and rising housing prices as a result of factors other than those that can explain the rise in prices in Sweden. In both Ireland and Spain, which were hit hard by the crisis in terms of sharply rising unemployment and falling housing prices, housing production increased dramatically in the decade leading up to the financial crisis, which was not the case in Sweden.

One interesting note in Memorandum 8 is also that the housing prices in Ireland and Spain rose sharply in parallel with the pronounced increase in housing production. It is therefore not likely that a sharp increase in housing production alone would be enough to dampen high price increases in housing and high debt levels among households. Memorandum 8 reports on several empirical studies that show that it is very difficult to determine if rising debt drives housing prices or the opposite.

When comparing aggregate debt ratios between countries, it is also relevant to analyse if the increase in indebtedness goes hand-in-hand with a fall in financial household saving. Memorandum 8 shows that the households' savings ratio (the households' financial saving as a share of GDP) started to fall sharply in Ireland and Spain in the middle of the 1990s. Savings reached their lowest point in 2008, i.e. at the start of the financial crisis. Private financial saving at this time was at around -6 per cent in Ireland and -9 per cent in Spain. This downturn could be *one* of the causes to both rising housing prices and rising indebtedness in these countries. In Sweden, households' financial saving increased instead from around 3 per cent of GDP in the mid-1990s to around 8 per cent of GDP in 2008. It is therefore not likely that a low level of financial household saving has contributed to the upswing in the Swedish households' debt ratio during this period.

The general conclusion in Memorandum 8 is that there are factors that explain the upswing in the aggregate debt ratio in Sweden that do not to the same extent explain the upswing in the aggregate debt ratio in several of the crisis countries. *Based on these factors alone*, this indicates that the risk of a similar negative macroeconomic development as that seen in other countries where the aggregate debt ratio has also increased sharply is *less pronounced* in Sweden. However, one should not dismiss risks solely on the grounds that fundamental factors are estimated to explain the growth in debts and housing prices.

There is a need for continued analysis

It is the hope of the Analysis Group that the analyses it has conducted have contributed to improving knowledge about the risks associated with the households' indebtedness in Sweden that are present for individual households and financial stability. However, there is a need for continued analysis. *First*, it is important to be able to better assess the effects of falling housing prices on private consumption and try to quantify what these effects in turn would have for consequences on banks' credit losses on loans to non-financial firms. In such an analysis it is important to not only look at how the debts relate to household income or to the market value of the home, but also to how they relate to the households' *total* wealth. The lack of data here is a very big problem. *Second*, it is important to try to assess the effects of the aggregate debt ratio *in the long term* as a result of demographic changes and urbanisation. *Third*, it is important to continue to analyse if there are grounds for taking additional measures to protect particularly exposed household groups, even if the risks in the lending to these groups when considered on their own do not represent a major threat to financial stability. *Fourth*, it is important to move on and study more closely which groups of households have negative net amortisation and which risks may arise from this in the long run.