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The impact of a maximum loan-to-value ratio on the borrowers' expenditure

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Finansinspektionen has recently implemented a ceiling for the loan-to-value ratio of 85 per cent – that is for how much it is possible to borrow in relation to the market value of the underlying collateral - for new mortgages.

We utilize the sample data from the home loan survey commissioned by Finansinspektionen to estimate the impact of the new guidelines on the expenditure on borrowing. The results indicate that a maximum LTV ratio of 85 per cent will correspond to an interest rate increase of about 1.5 percentage points for new borrowers with high LTV mortgages. Only about 20 per cent of new mortgages have an LTV ratio above 85 per cent, meaning that the majority of new lenders will not be affected by the new guidelines. However, given that the turnover rate for the whole outstanding mortgage debt averages four to five years, the LTV restriction is likely to become binding after a period of five years.

According to Finansinspektionen (the Swedish Financial Supervisory Authority), the guideline on a maximum loan-to-value (LTV) ratio[2] is intended to curb the growth in high LTV mortgages.[3] In particular, since a borrower with a high LTV ratio may end up with negative equity if the value of the collateral falls, consumer protection is mentioned as the main objectives of the LTV limit.[4] Although the maximum LTV ratio does not limit how much a household can borrow unsecured above the imposed ceiling, it aims to alter the borrowers' incentives through the higher expenditure on borrowing above the ceiling. Thus, the impact of the rule on household borrowing will depend on whether borrowers refrain from borrowing above the LTV limit (i.e. unsecured) as they face higher expenditure on borrowing.

This economic commentary aims to examine the impact of the maximum LTV ratio for household expenditure on borrowing in Sweden. The analysis is based on a simple model framework and utilizes the sample data from the home loan survey[5] commissioned by Finansinspektionen in 2009. Even though we do not estimate the direct effect on the demand for borrowing, this analysis, in combination with the descriptive statistics on the income of the borrowers, allows us to draw some conclusions about the impact of the maximum LTV ratio on the households' incentives to borrow above the limit.

In our simple framework we do not attempt to estimate the impact of the maximum LTV ratio on the demand for borrowing or on house prices. We argue, however, that more extensive and regular micro data sampling of the households' debt and their real and financial assets is needed to analyze developments in the mortgage market, in household indebtedness and the potential effects on house prices in Sweden.

Box 1: The maximum LTV ratio

From 1 of October 2010, a maximum LTV ratio of 85 per cent applies to all new mortgages,[6] where the LTV ratio is defined as the ratio between the unpaid principal amount of a mortgage loan and the appraised value of the collateral or the purchase price.[7]

The regulation applies to all new mortgages and to extensions to existing mortgage loans (i.e. loans with housing as collateral). Hence, the reissuance of existing loans or new loans that replace previous loans issued by another company are not subject to the LTV restriction as long as the total credit amount is not increased.

According to Finansinspektionen, the regulation aims to increase consumer protection by preventing the use of higher LTV ratios as a means of competition by financial institutions. In particular, as highly indebted households are less equipped to handle fluctuations in house prices and the real economy, the new rule focuses on increasing incentives for households to limit their debt.[8]

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2. For more details on the guideline on a maximum LTV ratio see Box 1.
3. Hereinafter, high LTV mortgages refer to mortgage loans with an LTV ratio above 85 per cent.
4. See FFFS 2010:2: Allmänna råd om begränsning av lån mot säkerhet i bostad, available in Swedish at www.fi.se.
5. For a detailed description see The Swedish mortgage market and bank lending, available at www.fi.se.
6. See FFFS 2010:2: Allmänna råd om begränsning av lån mot säkerhet i bostad), available in Swedish at www.fi.se.
7. As the LTV ratio can change due to a change in the value of a property, there could be incentives for a homeowner to change the appraisal value of a property.
8. See press release *Mortgages capped at 85 per cent as of 1 October* from 9 July 2010 at www.fi.se.

The maximum LTV ratio – a hard rule or moral suasion?

In general, an LTV limit may influence a household's expenditure on borrowing for two reasons. First, the maximum LTV ratio may influence the type of loan a lender can offer and hence, the interest rate charged on the loan. An LTV restriction will force some households that do not have enough equity to borrow unsecured. For example, prior to the new rules, housing loans were provided mainly in the form of first and second mortgages. First mortgages usually have lower interest rates and also more generous repayment options than second mortgages or unsecured loans. Since unsecured loans usually carry higher interest rates, new borrowers with high LTV mortgages are likely to carry higher interest rate costs. If the cost of borrowing increases significantly due to the new regulation, it is likely to make borrowers reluctant to borrow above 85 per cent of the LTV, which is the main objective of the regulation.

Second, the expenditure on borrowing will most likely increase due to stricter repayment requirements on unsecured loans. For instance, the average mortgage rate on new mortgage loans during 2005Q3-2010Q2 was 3.7 per cent and the amortization period ranged from 40 to 100 years.[9] For new unsecured loans (consumer loans), the average interest rate during the same period corresponded to about 6.3 per cent.[10] Prior to the new regulation, the amortization period for second mortgages varied between 10 to 30 years.

Note that the impact of the maximum LTV ratio on the households' borrowing expenditure depends to a large extent on the underlying assumptions presented in Box 2 below. If, for instance, unsecured loans are used as means of competition by financial institutions, this could imply lower interest rates or more generous repayment requirements for unsecured loans.

Some descriptive statistics for Swedish mortgages

To assess how much the expenditure on borrowing for an average Swedish household will increase due to a maximum LTV ratio of 85 per cent, we use the sample data from the home loan survey commissioned by Finansinspektionen. The sample consists of just over 6,800 newly-granted mortgages,[11] and corresponds to only about 0.7 per cent of outstanding mortgage debt in Sweden. From this sample we select all the households for which there is information on age, disposable income, total debt and the market value of the property concerned. This leaves us with a sample of 3,478 observations with a total debt corresponding to 0.3 per cent of outstanding mortgages.

According to the data from Statistics Sweden, about 23 per cent of mortgages were renewed during 2009 (including newly-issued mortgages). Hence, the turnover rate for the whole outstanding mortgage debt is on average four to five years, i.e. an average mortgage is renewed within a five year period.[12]

Data from the home loan survey indicate that only 20 per cent of new mortgages have an LTV ratio above 85 per cent (see Figure 1). The average LTV ratio in our sample is 67 per cent. However, there are several reasons why the average LTV ratio for new mortgages could be underestimated in the sample. First, our analysis is based on a small sample that corresponds to only 0.3 per cent of total outstanding mortgage debt. Second, loans included in the sample were granted in September 2009, a period that in the aftermath of the financial crisis was characterized by uncertainty about future economic developments, including house prices. This could, in turn, have made lenders (borrowers) more cautious when granting (taking) a new mortgage.

At the same time, according to the micro data from Statistics Sweden's annual cross-section survey (HEK) from 2007, the average LTV ratio was about 45 per cent in the stock of loans. That new loans have a higher LTV than the stock seems reasonable from a generational perspective. This is due to the very rapid growth in house prices

9. See The Swedish mortgage market and bank lending, available at www.fi.se.
10. Source: Finansmarknadsstatistiken.
11. The loans included in the sample were granted between the 28 and 30 September 2009. However, the sample also includes existing mortgages that had been renewed or moved to another creditor. In practice, such loans will not be subject to the newly imposed LTV limit as long as the amount of credit is not increased.
12. Even though the reissuance of existing loans or new loans that replace previous loans issued by another company are not subject to Finansinspektionen's LTV restriction if the total credit amount is not increased, this still affects the turnover rate. Hence, it is reasonable to assume that the LTV restriction will apply to the entire loan stock after a period of five years.

during the last 15 years. Assuming that the financial assets of first-time buyers have not grown at the same rate as house prices, then an increase in LTV is inevitable if the preferences of younger households have not changed in favour of cheaper housing.

It is important to stress that the home loan survey commissioned by Finansinspektionen does not provide data on the financial assets of the borrowers. This makes it hard to draw any definite conclusions regarding the over-indebtedness of the households with high LTV mortgages. For instance, it seems reasonable that a household with large financial assets may prefer to diversify instead of holding real assets in the form of housing. This means that although a household could finance its housing with 100 per cent equity it might prefer to hold some financial assets that are more readily available, such as stocks or bonds, and take out a mortgage to finance the housing purchase.

However, data from the HEK survey from 2007 suggests that households that have the highest loans in relation to their income do not have more financial assets than the average household (see Figure 2, where the households are divided into quintiles by the amount of debt in relation to their disposable income).

Next, according to the sample data, an average second mortgage (i.e. the loan amount exceeding 85 per cent of the market value of a property) for loans with an LTV above 85 per cent amounts to SEK 189,277. For the distribution of second mortgages we find that more than 80 per cent of the households have a second mortgage smaller than 300,000 SEK (see Figure 3).

Two other straightforward ways of describing the data are to see how the LTV ratio differs across households of different age and income profiles (see Figures 4 and 5).

Looking at the distribution of LTV ratios across age (see Figure 4), we find the expected pattern, that is that leverage decreases with age. However, Figure 5 shows that low-income households have a lower than average LTV ratio, suggesting that the high LTV ratios for young households (Figure 3) may be due to high-income households.

The LTV ratios rise with income and until the two top brackets, where its starts to decline slightly (see Figure 5). The decline is most likely linked to the fact that higher-income households are often older and have had more time to build up equity through price increases and by amortizing mortgages. Another notable feature is that for the average low-income household, defined as having a monthly disposable income of less than SEK 15,000, the LTV ratio is well below the limit of 85 per cent as suggested by the home loan survey commissioned by Finansinspektionen. Interestingly, we see that low-income households have less leverage in relation to the house price. Moreover, even the most highly-leveraged income group is nowhere near the LTV limit of 85 per cent. This does not necessarily mean that there are no highly-leveraged households, but simply that they are distributed across all income groups.

How much will expenditure on borrowing increase?

Assuming that households borrow the same amount as prior to the LTV restriction, the expenditure on borrowing for an average household with low home equity[13] will increase by about SEK 2,100 per month adjusted for tax deductions. More details on the calculations are provided in Table 1. This increase in expenditure on borrowing corresponds to an interest rate increase of about 1.5 percentage points for households with high LTV mortgages. Note, however, that the expenditure increases mainly due to mandatory repayments on the principal of the unsecured loan. For instance, in our example the repayment on the principal accounts for up to 99 per cent of the increase in expenditure.[14]

Note also that according to the survey, households with a high LTV mortgage have an average monthly disposable income (i.e. after-tax income) of SEK 37,380 SEK and more than 75 per cent have more than SEK 28,000 SEK. It is therefore reasonable to assume that an average household will be able to carry the additional expenditure arising due to the new regulation.

13. Home equity is defined as the difference between the loan amount and the value of a home.
14. We do not consider the possibility that a household may evade the increased expenditure on borrowing due to a requirement to amortize unsecured loans by taking additional unsecured loans to finance the loan repayments, meaning that each month the amortization on the unsecured loans is paid for by another unsecured loan.

Finally, to test the robustness of the results based on the data from Finansinspektionen we use the micro data from Statistics Sweden's annual cross-section survey, HEK. According to the HEK survey data from 2007,[15] an average mortgage with an LTV above 85 per cent amounts to SEK 1,266,000 . Our analysis (see Table 1 for the detailed calculations) shows that a maximum LTV ratio increases the expenditure on borrowing for a household with a high LTV mortgage by about SEK 1,600 per month, adjusted for tax deductions. This corresponds to an interest rate increase of about 1.5 percentage points. Note again that the expenditure on borrowing increases mainly due to stricter amortization requirements (of 10 years) on the second mortgage.

Box 2: Assumptions

First, in our analysis we assume that a household borrows a total of SEK 1,702,000 , which corresponds to an average total mortgage with an LTV ratio above 85 per cent in the sample data. Second, we assume that a household will borrow SEK 255,300 as unsecured debt, which correspond to a portion of the loan above 85 per cent.

Note that we do not take into account the fact that some borrowers, when facing higher expenditure on borrowing, may refrain from borrowing unsecured. This is naturally a very conservative assumption as households may refrain from borrowing above the limit due to higher interest rates and increased expenditure on borrowing above the LTV limit. In another extreme scenario, households could choose not to borrow unsecured at all. In this case, there will not be any effect on the households' borrowing expenditure.[16]

Next, we assume an amortization period of 10 years (and a repayment plan with constant monthly repayments on the loan), which corresponds to the most conservative amortization period for the second mortgages prior to the new regulation.

Finally, we use an interest rate of 6 per cent for the portion of the loan above 85 per cent, which corresponds to an average interest rate on unsecured loans (consumer loans). We also assume that households face a mortgage rate of 3 per cent for the portion of the loan below 85 per cent LTV.[17]

What's next? – Other implications of the maximum LTV ratio

Our results indicate that the households' expenditure on borrowing will increase due to the imposed LTV limit, mainly due to higher amortization payments. However, we do not take into account the fact that higher interest rates and increased expenditure on borrowing above the LTV limit are likely to have an impact on the households' willingness to borrow. To estimate the effects of the maximum LTV ratio on the demand for borrowing a more complicated framework would be required, including for instance an estimation of a demand function for Swedish borrowers with respect to interest rates and other control variables.

We also suggest that it is uncertain whether the sample used in the analysis provides reliable information about the LTV ratio for new mortgages, because of the small sample size and the particular timing of the sampling. It would therefore be of great interest for macroprudential supervision to follow up with additional home loan surveys in order to estimate the effects of the new LTV guideline on the demand for borrowing. More extensive sampling on a regular basis would allow us not only to study the impact of the LTV limit on the demand for loans but also to follow the developments in the mortgage market in more detail.

We argue that the dataset should be extended to include information on the financial assets of the households. Currently, the data sample from Finansinspektionen only covers 0.7 per cent of the mortgage loan stock and only includes data on the debt and income levels of households. This makes it impossible to render a complete picture of the level of indebtedness, and more importantly to identify over-indebted households. For example, households that have a very high LTV ratio could carry significant financial assets on their balance sheets, which could in turn be used to cover increases in both interest and amortization expenditure. However, data from the HEK survey from

15. Wealth tax was abolished from 2008 and no data on housing wealth is available for later periods.
16. This scenario is likely to have a greater impact on house prices through the constraints on borrowing.
17. Thus, we implicitly assume that mortgage rates do not change due to the maximum LTV ratio. This assumption is based on the fact that Swedish banks only include loans with an LTV ratio below 75 per cent in their covered bond pools. The average mortgage rate depends, however, on whether a household chooses a fixed or flexible mortgage rate.

2007 suggests that households that have the highest loans in relation to their income do not have more financial assets than the average household. In order for supervisors to conduct a thorough macroprudential analysis, new micro data on household debt in relation to income and real and financial assets is of the utmost importance.

Turning to the banks, our analysis is based on the simplifying assumption that the supply of loans or the pricing of unsecured loans will not change due to the regulation. However, on the one hand, the banks unsecured lending implies higher risk weights, meaning that the risk-weighted assets and the banks' capital requirements are likely to increase. On the other hand, if there is increased competition, the pricing and repayment requirements for unsecured loans could have an opposite effect on the banks' lending (as well as on the demand for borrowing). Thus, estimating the impact on the banks' lending channel stemming from the new guidelines would also be of interest in future studies.

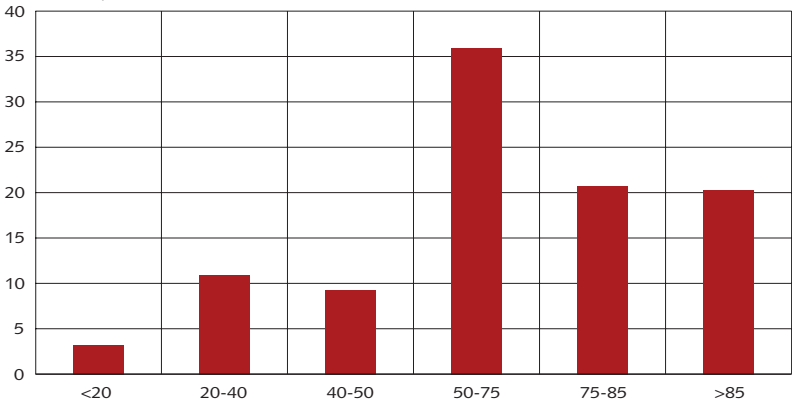
Table 1. Payments on a loan with a maximum LTV ratio of 85 per cent

	The loan survey data and no restriction on LTV	**The loan survey data and a maximum LTV of 85 per cent**	**The HEK data and no restriction on LTV**	**The HEK data and a maximum LTV of 85 per cent**
Total mortgage loan	1 702 000	1 702 000	1 266 000	1 266 000
Of which				
(i) first mortgage	1 702 000	1 446 700	1 266 000	1 076 000
(ii) second mortgage or unsecured loan (part above 85 per cent)	0	255 300	0	190 000
Interest rate (first mortgage)	3 per cent	3 per cent	3 per cent	3 per cent
Interest rate (second mortage or unsecured loan)		6 per cent		6 per cent
Amortization period (first mortgage)	No amortization required	No amortization required	No amortization required	No amortization required
Amortization period (second mortgage or unsecured loan)		10 years		10 years
Payment at the end of the month (first mortgage)*	2 979	2 532	2 216	1 883
Of which				
(i) average monthly interest payments*	2 979	2 532	2 216	1883
(ii) payment that is principal	0	0	0	0
Payment at the end of the month (second mortage or unsecured loan) assuming constant repayments on the loan	0	2 578	0	1918
Of which				
(i) average monthly interest payments*		450		335
(ii) payment that is principal		2 128		1 583
Total payment at the end of the month*	2 979	5 110	2 216	3 801
	Expenditure on borrowing increases by SEK 2 131, which corresponds to an interest rate increase of about 1.5 percentage points		Expenditure on borrowing increases by SEK 1 585, which corresponds to an interest rate increase of 1.5 percentage points	

*Assuming 30 per cent deduction for interest payments.

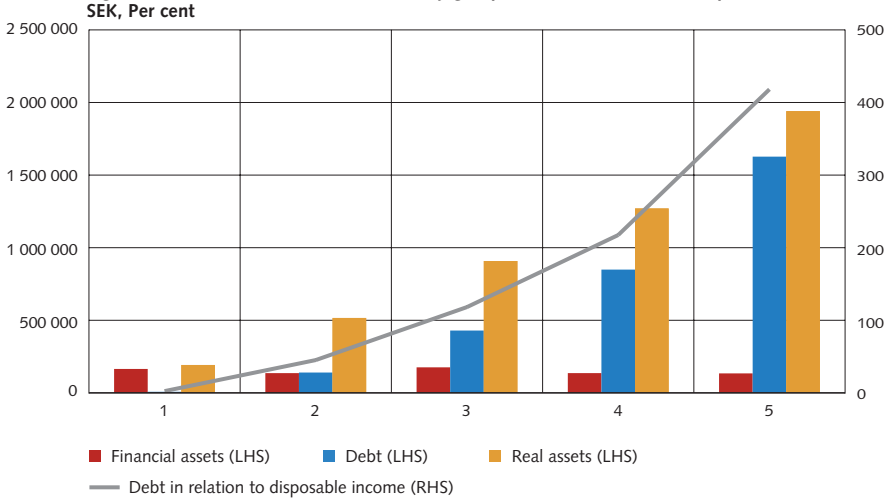
Figures

Figure 1. Distribution of LTV ratios on all new mortgages in the sample
Per cent, LTV ratio



Sources: Finansinspektionen and Sveriges Riksbank.

Figure 2. Distribution of assets and debt by groups of debt in relation to disposable income
SEK, Per cent

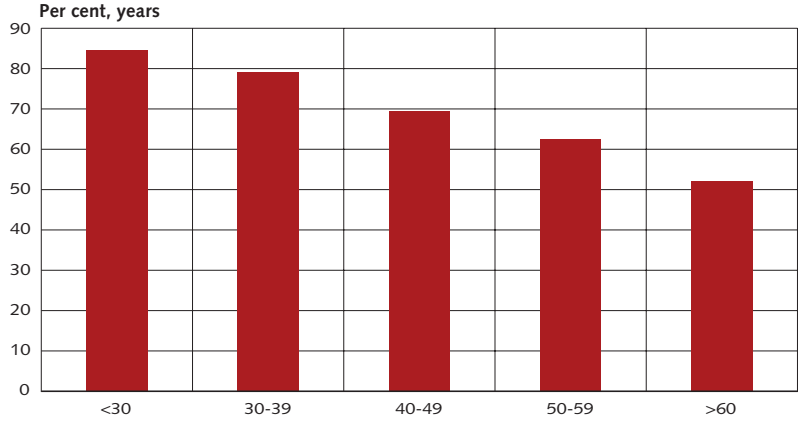


Sources: Statistics Sweden and Sveriges Riksbank.

Figure 3. Distribution of loans exceeding 85 per cent LTV
Per cent, thousand SEK

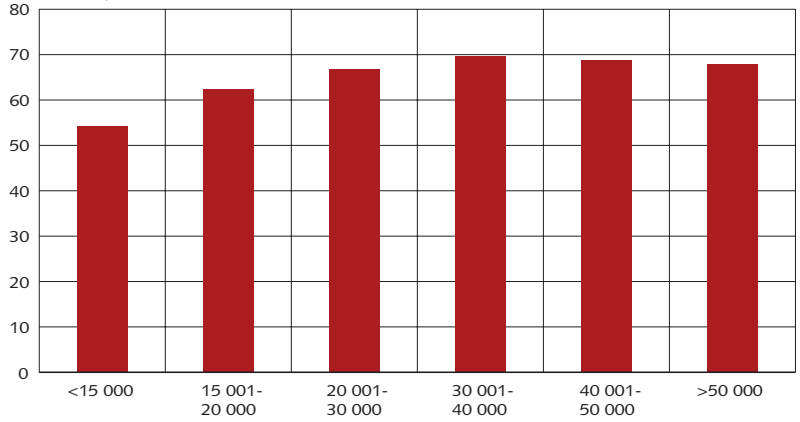
Sources: Finansinspektionen and Sveriges Riksbank.

Figure 4. Average LTV ratio for households of different age
Per cent, years



Sources: Finansinspektionen and Sveriges Riksbank.

Figure 5. Average LTV ratio across monthly disposable income
Per cent, SEK



Sources: Finansinspektionen and Sveriges Riksbank.