

Mortgage rate choice: the effect of bank advice

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Abstract

Because of drastically increased home prices and debt ratios during the last decade, households in Sweden have become financially more vulnerable to changes in mortgage rates. This article attempts to explore empirically the driving forces behind mortgage choice among home owners in Sweden. Data were collected through interviews and a questionnaire directed to homebuyers in the Stockholm area. The results show three major factors influencing mortgage choice: Bank advisors and - in line with earlier findings - income and loan-to-value ratio. The importance of bank advisors for mortgage choice is a finding that, to the author's knowledge not been established before. There is evidence that borrowers who perceive themselves as being influenced by their bank are less likely to have adjustable rate mortgages (ARMs) thus avoiding exposure to sudden peaks in mortgage expenditure. This article provides insights for those responsible for giving advice concerning mortgages and to policy makers in connection to the ongoing discussions within the EU about rules intended to protect borrowers from irresponsible lending and to ensure that mortgages go only to those who can afford them.

Introduction

Previous research, primarily from the United States, has indicated that mortgage rate choice is an important factor for households and the housing market. In a paper from 2003, Campbell and Cocco called attention to the fact that the choice of mortgage interest may have a significant impact on a household's standard of living and financial situation. More recently Campbell (2013) pointed out that residential mortgages are of first-order importance not only for households but also for financial institutions and macroeconomic stability.

Because of drastically increased home prices and debt ratios during the last decade, households in Sweden have become financially more vulnerable to changes in mortgage rates. During the period of 2000–2008, prices for single- or two-family housing units in Sweden more than doubled; for condominiums, the average price increased by 175 per cent during the same period. Increased housing prices have led to an increase in the indebtedness of households. The debt ratio (defined as household debt in relation to disposable income) increased from approximately 100 per cent in 2000 to about 150 per cent in 2008 (Sveriges Riksbank, 2008). In 2013 this figure now sits at 165 per cent.

During the period 2000–2008, a change occurred in the type of mortgage lock-in period chosen by households in Sweden. As an example, in 1998 about 30 per cent of all new housing lending on an annual basis comprised adjustable rate mortgages (ARMs). In 2004, the share of ARMs was about 54 per cent, and by 2008, it had reached 67 per cent (Statistics Sweden, 2012). Earlier studies have established that the households most affected by adjustable interest rate increases often have small margins and also tend to underestimate – or know very little about – how much the interest rate may actually change (Bucks and Pence, 2008).

All in all, the higher proportion of ARMs has led to a situation where some households might be more exposed to financial vulnerability, which can be viewed as a source of

economic and housing market instability, as pointed out in a British context by Vickery (2006). Because the British mortgage market is similar to that in Sweden, (ARM-dominance, high pre-payment penalties for fixed rate mortgages – FRMs – and recourse mortgages), it is reasonable to assume that high proportions of ARMs might also be a source of instability in Sweden.

The main purpose of this paper is to empirically investigate the factors upon which Swedish homebuyers based their mortgage decisions before the financial crisis affected the Swedish mortgage market in 2008. This period is characterised by a time when mortgage rates were considerably higher compared to previous years and those that followed after the crisis (For mortgage interest levels, see Appendix A). At this time the Swedish central bank still had expectations of unchanged repo rate levels for the following three years. A second purpose is to determine whether there is need to be concerned regarding these developments and the potential impact on household mortgage expenses; findings that might be of importance for mortgagees, the banking industry and possible policy changes.

Data were collected initially through an interview study and based on the findings from these interviews, a questionnaire was administered to households in the Stockholm area. Based on the insights from previous international studies into household mortgage choice, a number of hypotheses were tested using binary regression.

The next section presents the findings of earlier studies and the hypotheses based on existing literature and a hypothesis-generating pilot study. Data and methods are then presented, followed by the results. The paper ends with an analysis and conclusions.

Literature and hypotheses

A number of international studies have shown, theoretically or empirically, the factors that influence households' mortgage choices. These factors generally fall into two categories: price and other contract factors, and borrower characteristics (Coulibaly and Li, 2009).

A number of studies have shown the impact of price factors, such as Dhillon *et al* (1987), Leece, (2000), Vickery, (2006) and Chambers *et al* (2009). The importance of the loan-to-value (LTV) ratio was underlined by Duffy and Roche (2005), who revealed that buyers with a high LTV ratio opted for fixed rate mortgages (FRMs), thus minimizing potential liquidity problems. A positive association between high LTV ratios and FRMs was also found by Vickery (2006).

Some studies have also revealed the importance of borrower characteristics when it comes to mortgage choice. In an American setting, Brueckner and Follain (1988) noted that a higher income makes it more probable for borrowers to choose ARMs. The positive association between income and ARMs has also been supported by Coulibaly and Li (2009) and Fortowsky *et al* (2011). Finke *et al* (2005) however found the opposite, indicating that there are issues concerning the relation between income and mortgage choice that could be a result of differences in the economic climate.

Sa-Aadu and Megbolugbe (1995) demonstrated the importance of age, which has been backed up by a more recent Italian study (Paiella and Pozzolo, 2007) establishing that the higher the age of the household, the lower the likelihood of choosing ARMs. In the opinion of the Italian authors, the results showed that weaker groups in terms of resources prefer to lock in their interest payments.

The aforementioned studies lead to the formulation of the following four hypotheses:

- *Hypothesis 1:* The higher the income in the household, the greater the probability that borrowers choose ARMs over FRMs, following the results of Brueckner and Follain, (1988); Coulibaly and Li (2009) and Fortowsky *et al* (2011).
- *Hypothesis 2:* The lower the LTV ratio, the higher the likelihood that borrowers will choose ARMs over FRMs.
- *Hypothesis 3:* The higher the age of the head of the household, the lower the probability that borrowers will choose ARMs over FRMs.
- *Hypothesis 4:* If borrowers perceive the interest rate gap to be important for the mortgage choice, then ARMs will be the more probable choice, according to the fact that ARMs are less costly during the investigated time period. This is in line with findings by Leece, (2000); Vickery, (2006) and Coulibaly and Li (2009).

Based on a pilot study, showing that several of the interviewed borrowers found the media and/or bank advisors to have been of importance for their mortgage choice, two additional hypotheses are formulated: (Data and method of the pilot study are accounted for in the next section.)

- *Hypothesis 5:* The media, in this context understood to be the press, will influence on choice. Because ARMs have been highlighted as the most profitable in the Swedish media during the period studied (e.g. Privata Affärer, 2007; Dagens Industri, 2008), the hypothesis is that those who say that they were influenced by the media choose ARMs to a greater extent.
- *Hypothesis 6:* Those who claim they have been influenced by their bank advisor will choose ARMs to a lesser degree.

The media's influence on financial decisions has been shown by for instance Meschke, 2004; Engelberg and Parson, 2009 and Barber and Odean, 2011. As for advisors, the

importance for the home loan market has been shown by Devlin (2002) and for other financial decisions by for example Bluetghen *et al* (2008) and Eriksson *et al* (2009).

The following basic model was created:

$$\text{Mortgage choice} = B_0 + B_1 (\text{Income}) + B_2 (\text{Loan to value}) + B_3 (\text{Age}) + B_4 (\text{Important for choice: rate gap}) + B_5 (\text{Important for choice: media}) + B_6 (\text{Important for choice: financial advisor}) + e$$

Method and basic data

Pilot study

An initial qualitative study based on individual interviews was conducted to get an understanding of borrowers' own reflections concerning their mortgage choice and thereby generate possible new hypotheses. The interviews were undertaken with individuals who had purchased apartments in the city of Stockholm between 1 February to 1 July 2008. Four major real estate agent chains took part in customer selection for the study. This resulted in a convenience sample.

The Stockholm area was chosen because the prices of apartments far exceeded the average price for the whole of Sweden: in 2008, the average price for an apartment in Sweden was 1.073 million SEK, whereas in the county of Stockholm, it was 1.866 million SEK (Statistics Sweden, 2008). Based on this price difference, the Stockholm market was considered the most vulnerable to changes in mortgage rates and, consequently, the most interesting to study.

The selection of interviewees took place in collaboration with real estate agents and the selection criteria were as follows: The buyers had to have purchased an apartment, not a detached or terraced house; the buyers had to have taken out a mortgage in connection with the purchase; and the apartment had to be located in the centre of Stockholm. The selection of

area depended partly on the comparability of the properties and partly on the possibility of meeting the property buyers face-to-face at the time of the interviews. The interviewees were buyers who agreed to participate after having been asked by their real estate agents if they would participate in a study on mortgage choice. The participants were promised anonymity, and, moreover, they received a lottery ticket for 25 SEK as a mark of gratitude for their participation.

The interviews were carried out either at the real estate agent's office in connection with taking possession of the property or by phone a few weeks afterwards; in the great majority of cases, interviews took place within a few days so as to avoid "memory lapses". As a rule, the duration of these interviews was 25 to 30 minutes. In those cases where there was more than one buyer in the household, the buyers themselves agreed who would answer the questions.

Data about the 30 interviewees and the purchased apartments are shown in table 1:

Table 1. Basic data from interviews with home buyers.

	Lowest/highest value	Average value	Median
Age	25-57	34.5	32.5
Household income (SEK)	264.000-1.5 MSEK	692.400	660.000
Loan-to-income ratio	2.55-8.10	4.51	4.48
Loan-to-value (LTV)	0.13-1.0	0.69	0.76
Price (MSEK)	1.53-4.73	2.81	2.98

The vast majority of the interviewees had only ARMs: 21 households. Eight had chosen a mix of ARMs and FRMs and just one household had only an FRM. The interviews showed a distinct similarity when the respondents answered the questions about what they based their decision on. It was possible to give multiple answers and the most common financial reason was the interest rate gap: almost half the group gave this answer. The second most common reason was "historically, ARMs have been best". Other frequent answers were "My financial situation can tolerate higher mortgage rates" and "Because of earlier experiences". Regarding influences other than purely financial, the answers were also in agreement: the media and

bank staff were stated as being influential factors by 50 per cent of the interviewees. For a more detailed description of the pilot study, see Hullgren (2010).

Main study

In the spring of 2009, a questionnaire was sent to homebuyers as part of a study initiated by the Department of Real Estate and Construction Management at the Royal Institute of Technology in Stockholm and The Association of Swedish Real Estate Agents' research fund.

The primary aims of the questionnaire were to examine the following:

- How buyers had financed their property purchases
- What type of loan or mortgage they had chosen
- The extent to which homebuyers worried about financial matters

The house buyers were also asked to specify how strongly their choices had been influenced by a number of factors found important in the pilot study.

The survey population consisted of households that bought their houses between the end of 2007 and April 2008 – about the same period as the pilot interviews were performed. The questionnaire, was mailed to 987 households in five municipalities within Stockholm County at the end of January and beginning of February in 2009 (for more details, see Kulander and Lind, 2009). Because it was impossible to retrieve information on addresses of households that had bought tenant-owned flats, the survey was limited to households that had bought single-family housing units, for which records of names and addresses were found in the land tax register.

Respondents were promised anonymity, which means that reminders were not sent out. The response rate was around 37 per cent. The results of this study are based on the completed questionnaires of 297 respondents after removing questionnaires lacking vital data.

A binary logistic regression was performed to assess the impact of the tested variables on the likelihood on choosing ARMs over FRMs.

The constructs used in the regressions are presented in Table 2.

Table 2. Variables in the regression. (n=297)

Variable	Definition	Mean
MChoice	A binary variable indicating whether a mortgagee has chosen mostly ARM or not. ≥75% ARM = 1 All others = 0	0.53
INC	A variable illustrating monthly income in household before taxes. -29,999 = 1 30,000-49,999 = 2 50,000-69,999 = 3 ≥70,000 = 4	2.38
LTV	A binary variable indicating Loan-to-value ratio. ≥75 per cent = 1 All others = 0	0.16
AGE	A variable illustrating the age of the head of the household. 18-29 = 1 30-49 = 2 50-64 = 3 ≥65 = 4	2.16
RGAP	A binary variable illustrating the respondent's rating of the importance of the mortgage rate gap for the mortgage choice. Important or quite important = 1 All others = 0	0.87
MEDIA	A binary variable illustrating the respondent's rating of the importance of the media for the mortgage choice. Important or quite important = 1 All others = 0	0.78
BANK	A binary variable illustrating the respondent's rating of the importance of bank staff for the mortgage choice. Important or quite important = 1 All others = 0	0.63

The dependent binary variable mortgage choice (MChoice) is derived from a question in which the respondents were asked how large a part of the total amount of their mortgage loan was ARM or FRM respectively. The explanatory variables in the model are constructed as follows:

The variable income (INC) is based on the respondents report on their total household incomes as one of four categories.

Loan-to-value ratio (LTV) is based on the answer to a question on mortgage amount divided by buying price.

Age (AGE) is based on the age of head of the household in four different age categories.

RGAP identifies respondents indicating whether they find the mortgage rate gap quite important or important for their choice (1) or not important (0).

MEDIA shows respondents indicating whether they find the media quite important or important for their choice (1) or not important (0).

BANK shows respondents indicating whether they find the bank advisor quite important or important for their choice (1) or not important (0).

Results

The model contains six independent variables (INC, LTV, AGE, RGAP, MEDIA and BANK). This model, which contains all predictors, is statistically significant, $\chi^2(6, n = 297) = 32.066, p < 0.001$, indicating that the model as a whole is able to distinguish between the respondents who chose mostly ARMs (≥ 75 per cent) and all others. The model as a whole correctly predicted 63.3 per cent of cases (see Table 3).

Table 3. Logistic regression predicting likelihood of the choice of mostly ARM.

	<i>B</i>	<i>S.E.</i>	<i>p</i>	<i>Odds Ratio</i>
INC	0.618	0.160	0.000**	1.855
LTV	-1.441	0.538	0.007**	0.237
AGE	0.146	0.301	0.628	1.157
RGAP	0.356	0.389	0.361	1.427
MEDIA	-0.043	0.323	0.895	0.958
BANK	-0.582	0.265	0.028*	0.559
Constant	-0.554	0.953	0.561	0.575

Note. The dependent variable is MChoice The number of observations is 297. The Cox and Snell R^2 is .102; the Nagelkerke R^2 is .137. **=Statistically significant at the 0.01 level (2-tailed).

*=Statistically significant at the 0.05 level (2-tailed).

As shown in the table, three of the independent variables are statistically significant parameters to the model (INC, LTV and BANK). The strongest predictor of choosing mostly ARM is LTV, with an odds ratio (OR) value of 0.237. The result indicates that respondents with high LTVs are approximately four times less likely to choose ARMs than those with lower LTVs, controlling for all other factors in the model.

The OR value of the predictor INC is 1.855 and indicates that respondents with higher income levels are almost two times more likely to choose ARMs than those with lower income levels, controlling for all other factors in the model.

The results also show that those who perceive bank advisors as an important factor are almost two times less likely to opt for high levels of ARMs. The relationship between the independent variables in the model was tested and showed no issues with multicollinearity.

Analysis and conclusions

This paper presents the results from a survey among home buyers taking mortgages in the Stockholm area in Sweden. The purpose was to investigate which factors influence their choice, based on earlier international findings and a Swedish pilot study. An additional purpose was to determine whether there is need for concern regarding future developments regarding the household's mortgage expenses.

Results are consistent with the hypothesis that high income households choose ARMS to a greater degree and are in line with studies such as those by Brueckner and Follain (1988), Coulibaly and Li (2009), and Fortowsky *et al* (2011). These findings can be contrasted with those of a study in the United States that suggests the emergence of a new trend – namely, higher proportions of households in lower income brackets are more frequently choosing ARMs and, by doing so, put themselves at greater financial risk (Finke *et al* 2005). One reason seems to be that the American ARM often begins by offering interest rate reductions,

or “teaser rates”, so as to appear more financially favourable. This marketing technique is not used in the Swedish market and can be one of the reasons behind the differing results. The results suggest that there is no imminent risk of households being unable to manage their mortgages because those Swedish households that mainly choose ARMs tend to have relatively high incomes.

This study also gives support to the hypothesis that households with lower LTV ratios opt for ARMs to a higher degree than those with higher LTV ratios. This is in line with earlier international findings and gives evidence that these households see no major liquidity problems.

An interesting finding is that recommendations from bank advisors seemingly are of importance for mortgage choice: individuals who perceive themselves as influenced by their bank advisors are significantly less inclined to choose high levels of ARMs. This finding has not been previously tested internationally and is one of the main contributions of this paper.

It is an interesting finding in light of the on-going discussions where the European Parliament Economic and Monetary Affairs Committee approved new rules in 2012 to ensure that house buyers are properly informed before taking on a mortgage. These rules aim at ensuring that borrowers are offered mortgages that are tailored to their needs and that their creditworthiness is properly assessed.

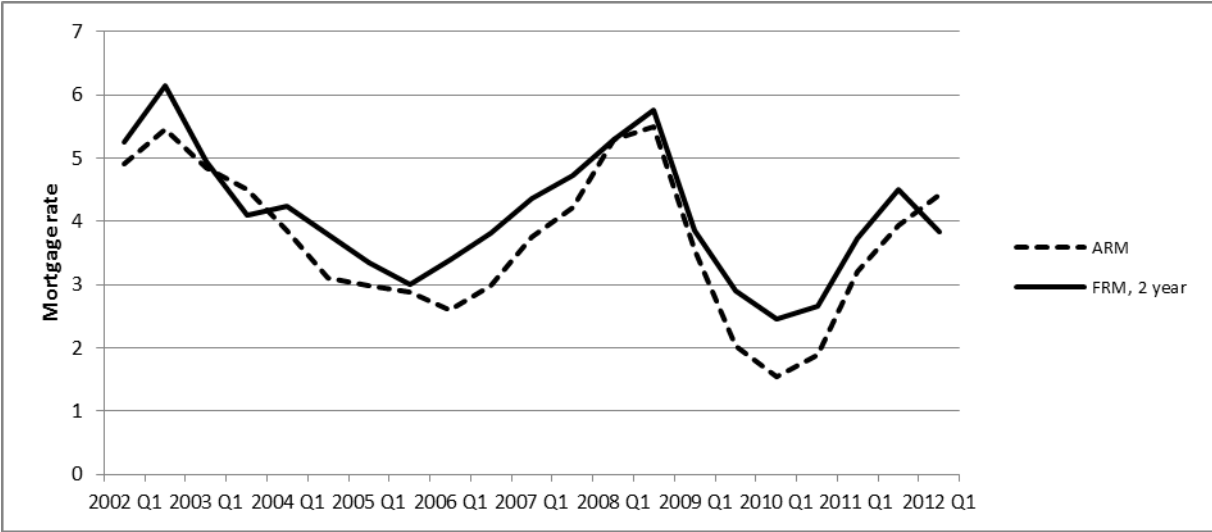
Three of the hypothesised factors did not statistically contribute to the model: AGE, RGAP and MEDIA. The fact that RGAP was not statistically significant contradicts earlier findings by Leece, (2000); Vickery, (2006) and Coulibaly and Li (2009). One reason could be the fact that there were only minor differences between the ARM and FRM rates during the investigated period. A subject for future studies is to investigate the importance of the ARM-FRM gap when this is wider.

The pilot study and the questionnaire study give rise to conflicting results concerning the influence of the media – the pilot study indicated that media is an influential factor in the mortgage rate choice but the questionnaire did not. Whether the fact that the two studies are based on different categories of buyers plays a roll or not or if there are other factors playing in is unclear and this might be a topic for future investigation.

Discrepancies between earlier findings and the Swedish case might be attributed to the difference between mortgage products in different countries and the time period when the studies were conducted. The fact that this study was carried out in a limited geographical area is an additional limitation. Nonetheless, the findings of this study highlight issues that are worthy of further investigation.

APPENDIX A

Mortgage interest gap 2002 Q1–2012 Q1 (Source: Swedish Housing Finance Corporation, 2012)



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