Borrower characteristics and mortgage choice in Sweden

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Introduction

The financial crisis of 2007–2008 showed household decisions concerning mortgages are of importance for the financial stability of not only households but also, in a broader context, economic stability. When making decisions about mortgages, individuals must consider a number of different aspects. Purchasing a home is a long-term engagement, and having a mortgage can represent a great budget constraint. The present article answers calls for more knowledge about the effect of consumer characteristics (Campbell, 2006), and, in light of the US mortgage crisis, for more information on local mortgage market practices so as to find examples that can serve as best practices for policymakers (Campbell, 2013).

The purpose of this article is to enhance knowledge of the driving forces behind mortgage choice. A complimentary aim is to make a contribution to international comparisons. This study is based on data from a national randomized survey conducted in Sweden in 2012.

Earlier international studies focusing on the driving forces behind consumers' mortgage choices in various countries have demonstrated the importance of both contract factors and consumer characteristics (e.g. Brueckner and Follain, 1988; Sa-Aadu and Megbolugbe, 1995; Duffy and Roche, 2005; Vickery, 2006; Chambers *et al.*, 2009; Coulibaly and Li, 2009; Cox *et al.*, 2011). Cross-country variations in mortgage market structure have also been described (Tsatsaronis and Zhu, 2004; Lea, 2010; Campbell, 2013).

In this study a number of factors such as income, age, education and loan-to-value (LTV) ratio are examined, as well as consumers' own perceptions of important influences on

mortgage choice. Logistic regression is performed to test a model based on hypothesized factors.

This article is structured as follows: A brief literature review, hypotheses and a model follow this introduction. Earlier results from different countries are compared with those obtained from the Swedish mortgage market. The data and the methods used are then presented. Results are provided, and an analysis of the findings and a discussion of their implications for theory and practice conclude the paper.

Literature and hypotheses

A brief review of the literature highlights a number of factors that may shed new light on how Swedish consumers decide between adjustable rate mortgages (ARMs) and fixed rate mortgages (FRMs). These factors are described and modelled in the following paragraphs.

Loan-to-value ratio

Duffy and Roche (2005) found that the LTV ratio had an impact on mortgage choice — namely, that buyers with high LTV ratios opted for FRMs. This finding is in line with that of Brueckner (1986), who reported that those making large down payments (a low LTV ratio) opted for ARMs. Vickery (2006) also found a positive relationship between high LTVs and FRMs. Presumably, households with higher LTV ratios choose FRMs to avoid sudden increases in mortgage rates and potential liquidity risks. In line with these findings, we hypothesise that borrowers with higher LTV ratios prefer FRMs.

Income

Previous studies have shown that the impact of income is not unequivocal concerning mortgage choice. Most studies have found a positive relationship between higher income and ARM preference (Coulibaly and Li, 2009; Fortowsky *et al*., 2009; Hullgren and Söderberg,

2013). However, Finke *et al*. (2005) found in an American setting that borrower categories that increasingly preferred ARMs to FRMs were low-income earners and less wealthy and that households experiencing credit problems were less equipped to handle the impact of interest rate increases. Because the majority of studies, including earlier Swedish ones, found a positive relationship between higher income and ARMs, we hypothesise that individuals with lower incomes have a greater tendency to choose FRMs.

Education

Research on mortgage choice has highlighted the importance of household educational level. For example, Bucks and Pence (2008) found that households with less education often experienced the greatest changes when adjustable interest rates increased. In addition, Campbell (2006) reported that mortgage refinancing was less effectively performed by households with a lower level of education. Regarding the actual mortgage choice, Leece (2000) found that a higher level of household education decreased the probability of a household choosing an FRM. Using data from the American Survey of Consumer Finances, Coulibaly and Li (2009) found that higher education increased the probability of choosing an ARM. In a recent Swedish study, Hullgren and Söderberg (2013) found that less educated consumers had a preference for FRMs. Based on these findings, we predict the following: Individuals with a lower level of education are more likely to choose an FRM.

Age

Among American studies showing age to influence mortgage choice, Sa-Aadu and Sirmans (1995) reported that younger borrowers tended to use short-term mortgages. Sa-Aadu and Megbolugbe (1995) predicted that higher age has a negative impact on the probability of choosing an ARM. This finding is supported by Paiella and Pozzolo (2007), who showed that the higher the age, the lower the likelihood for a household to choose an ARM.

Other studies have found the opposite to be true: In Britain, Leece (2000) found higher age to decrease the probability for choosing an FRM. This finding is also supported by Australian data reported in a study by Blacklow *et al*. (2010). Owing to the contradictive nature of earlier findings, we base the direction of the hypothesised relationship between age and mortgage choice on our analysis of the Swedish mortgage market presented in the section titled Mortgage markets and the Swedish housing market. Because today's older generation (the baby boom generation) has established good income and education levels (Lindbergh *et al*., 2008) and benefitted from a large welfare state (Andersson and Abramsson, 2012), it is reasonable to expect this group to be less concerned about their financial situation than younger age groups. This is in line with the findings of Leece, whose research focuses on a market similar to the Swedish one. Therefore, we hypothesise that older borrowers have reduced preferences for FRMs.

Risk tolerance

Individuals perceive their financial situations differently, and based upon their perceptions, they make different decisions about, for example, how much to borrow when buying a home and about what risks to take by knowing (FRM) – or not knowing (ARM) – in advance what to pay for mortgages. It is important to distinguish between risk tolerance, which indicates how much risk an individual investor is willing to take to reach a specific goal, and risk perception, which indicates the risk the same individual perceives to be inherent in a specific investment suggestion. The concept of risk tolerance has been explored (e.g., Hanna *et al*., 2011), and different methods for developing risk tolerance assessment instruments have been devised (e.g. Grable and Lytton, 1999). Roszkowski and Davey (2010) showed that risk tolerance is a relatively stable concept, whereas risk perception is not. We hypothesise that borrowers who see themselves as risk averse are more likely to choose FRMs than more risk-seeking individuals.

Reported restricted household resources

Literature on the impact of loan takers' tolerance of sudden increases in mortgage costs is scarce. However, a Swedish study by Kulander and Lind (2009) found statistically significant differences between groups that experienced worry and those who felt more secure in their ability to manage their monthly costs concerning the principal and interest: Contrary to expectations, those who had taken a lower share of ARMs were statistically significantly more worried than those with a higher share. Coulibaly and Li (2009) found that financial stress plays an important role in the choice of mortgage rate, with more financially constrained households tending to choose ARMs. In the US context, ARMs initially entail lower payments than FRM contracts (Coulibaly and Li, 2009). However, taking into consideration the terms of the Swedish loan market, we hypothesise that individuals who perceive themselves as having a low level of ability to handle sudden increases in mortgage costs are more likely to choose FRMs. A Swedish study by Hullgren and Söderberg (2013) found evidence that reduced ability to handle sudden increases in mortgage costs is one factor that influences borrowers to choose FRMs.

Other factors of importance for mortgage choice

Many studies have reported on the impact of the spread between FRMs and ARMs on mortgage choice. Early theoretical papers, such as those of Smith (1987) and Brueckner and Follain (1988), found this to be the case. More recently published empirical papers, such as those by Goldberg and Heuson (1992), Leece, (2000), Vickery (2006) and Coulibaly and Li (2009), also corroborated the importance of mortgage rate spread in concluding that mortgage choice is price sensitive. Because the average list rate difference during the investigated time period was negligible, we regarded this as a timely opportunity to explore other possible influencing factors.

Importance of personal experience in home buying/repeat buyers

Studies on this topic are scarce. Moore (2003) investigated how consumers learned about managing their money. She found that the most important sources of knowledge were personal financial experiences (62 per cent). Devlin (2002) showed that having a previous mortgage was an important choice criterion for selecting a mortgage provider but not for making the actual mortgage choice. Cox *et al*. (2011) tested the impact of prior homeownership but did not obtain any significant results. These findings are in line with the results from an Australian paper by Blacklow *et al*. (2010).

Influenced by media

Research has showed that the media play an important role in shaping public perceptions by influencing consumer demand (Kalaitzandonakes *et al*., 2004), investors (Barber and Odean, 2011), financial market participants (Tufano, 2009; Engelberg and Parsons, 2011) and stock prices (Meschke, 2004). Therefore, the media could also impact mortgage choice. A Swedish study on households' mortgage choices highlighted the media's impact on those decisions (Hullgren, 2010) and found that mortgagees claiming to have been influenced by the media to a higher degree chose ARMs. Cox *et al*. (2011) found lower educated households and those with lower income tended to rely more on mortgage advice provided in the public media than did older, higher educated and wealthier households.

Importance of advisors

Several studies have investigated the effects of professional advice on consumers' financial decisions, such as those involving retirement planning (Marsden *et al*., 2011) and portfolios (Bluethgen *et al*., 2008; Kramer, 2009), consumers' level of confidence (Chatterjee *et al*., 2011) and consumers' understanding of the risks inherent in different investments (Eriksson *et al*., 2009). In addition, a study provided evidence of professional advice as the single most

important choice criterion in the home loan market (Devlin, 2002). Recent Swedish studies have also highlighted the importance of professional advice. One study found that respondents who reported being influenced by advisors chose to a higher degree to divide their home loans into ARMs and FRMs (Hullgren, 2010). This finding is in line with that of another Swedish study (Hullgren, 2012) indicating that bank advisors assist their mortgage customers by recommending that they choose both ARMs and FRMs so as to minimise their financial vulnerability.

The following basic model was created:

Mortgage choice = B_0 + B_1 (Loan to value) + B_2 (Income) + B_3 (Education) + B_4 (Age) + B_5 (Reported risk aversion) + B_6 (Household financial risk tolerance) + B_7 (Important for choice: own experience) + B_8 (Important for choice: media) + B_9 (Important for choice: bank advisor + e

Based on earlier research, we hypothesise that the following factors influence Swedish home loan borrowers to choose mostly FRMs: having a high LTV ratio, low income, low level of education, high risk aversion and low financial risk tolerance and being older.

The impact of a set of additional factors (the rated importance of previous experiences with mortgages and the influence of the media and bank advisors) that were perceived by the home buyers as influencing their mortgage decision is unclear because this has not been extensively covered in earlier research. These variables are therefore all hypothesised as non-directional.

Mortgage markets and the Swedish housing market

Mortgage instruments differ between countries, depending on, for instance, the regulations of a particular country. The dominance of one instrument may occur for historical reasons — that is, the length of its existence and, thus, the degree of familiarity with borrowers and lenders. Apart from American studies, there are, to our knowledge, very few papers from

other countries concerning mortgage choice. Several American studies have found price variables and/or borrower characteristics to play an important role in mortgage choice. Because the American market is unlike most developed mortgage markets, the US results may not be applicable. A short survey of the literature on mortgage choice in five different markets is provided and summarised in Table 1 and elaborated on in the subsections that follow. Thereafter, the Swedish mortgage market situation is presented.

Table 1. Mortgage market characteristics and factors, in addition to price factors, influencing mortgage choice in 5 countries:

	Dominant mortgage type	Maximum LTV ratio (%)	Refinancing possible at low cost	Recourse lending	Borrower characteristics affecting mortgage choice	
United States	Fixed (FRM)	75-80	Yes	No	Income Mobility Age Financial sophistication	Higher income → ARM Higher income → ARM Higher age → FRM Least and most sophisticated → ARM for different reasons
Australia	Adjustable (ARM)	80	No	Yes	Income Age	Higher income → lower propensity for FRM Higher age → lower propensity for FRM
Italy	FRM/ARM	50	No	Yes	Age Education	Higher age → lower propensity for ARM Lower education → ARM
United Kingdom	ARM	90-100	No	Yes	Age	Higher age → lower propensity for FRM
Sweden	ARM	85 (after 2010)	No	Yes	Income Education Financial literacy Risk preferences	Higher income → ARM Higher education → ARM Higher fin. literacy → ARM Higher risk preference → ARM

United States

Following the introduction of ARMs in the early 1980s, research on households' choice between ARM and FRM contracts has primarily been conducted in an American setting. (For a more comprehensive description of the US mortgage market, see, for example, Green and Wachter, 2005; Vickery, 2006; Campbell, 2013) Two major research strands have evolved. One strand has a theoretical approach and models the problems associated with the decision-making process that borrowers experience based on different assumptions (e.g. Statman, 1982; Brueckner, 1986; Alm and Follain, 1987; Brueckner and Follain, 1988). Results from

these early studies showed that the optimal choice depended on various factors, including income stream, age, inflation and the mortgage interest rate spread.

The other strand deals with the impact of pricing and borrower characteristics. Several American studies have shown the impact of price factors, with the main finding that the spread between the FRM and the ARM is a primary determinant (e.g. Brueckner and Follain, 1988; Goldberg and Heuson, 1992; Campbell, 2006; Vickery, 2006; Coulibaly and Li, 2009). Another important price factor is the LTV ratio. Duffy and Roche (2005) found that buyers with a high LTV ratio opted for FRMs, thus minimising potential liquidity problems. Borrower characteristics linked to mortgage choice include income (Finke *et al*., 2005; Coulibaly and Li, 2009; Fortowsky *et al*., 2011), mobility (Brueckner and Follain, 1988; Sa-Aadu and Megbolugbe, 1995; Coulibaly and Li, 2009), age (Sa-Aadu and Megbolugbe, 1995) and financial sophistication (Smith *et al*., 2011).

Australia

In their 2010 study, Blacklow *et al*. analysed data from a mortgage application database from a major bank between 2006 and 2009 to identify the determinants of Australian mortgage choice. The Australian mortgage market also has recourse lending and is dominated by ARMs, as evident by the finding in the study by Blacklow *et al*. that 28 per cent of the applications in the database were for FRMs. Using a probit model, Blacklow *et al*. found that borrowers with higher income, higher age and higher LTV ratios had a lower propensity for FRMs. Gender did not influence the choice, nor did first-time home buyer status. Regarding the price factors, Blacklow *et al*. stated that the interest data were subject to substantial shortcomings and, thereby, meaningful interpretations could not be drawn from the data.

Italy

There is conflicting information about whether the Italian market, which has recourse mortgages, is ARM or FRM dominated. In their 2007 study, Paiella and Pozzolo reported that ARMs seemed to dominate the Italian market to a slightly greater degree. They used data from a survey conducted by the Bank of Italy to investigate the determinants influencing households' choice between FRM and ARM contracts. Using a probit regression, they found that individual borrower characteristics, such as employment and income, had little influence on mortgage choice. However, Paiella and Pozzolo did find that older borrowers were less likely to demand ARMs—a result that they suggested may be attributed to reduced liquidity constraints. The results of the study by Paiella and Pozzolo (2007) highlighted the importance of price variables: households were less likely to choose FRMs when the fixed-adjustable rate spread was high and when, for a given spread, the adjustable rate was high.

In a recent study using a logit regression, Zocchi (2013) finds that pricing variables, such as the level of the FRM and the differential between FRM and ARM, seems to play a dominant role for mortgage choice while borrower characteristics show a relatively modest impact. Low education has a statistically significant positive correlation to ARMs while age does not have any significance, contrary to Paiella and Pozzolo.

United Kingdom

Similar to the mortgage markets in Australia and Italy, the UK mortgage market is dominated by ARMs and recourse lending. (For a more comprehensive review of the UK mortgage market, see Miles, 2004). In his 2000 study, Leece investigated the choice of mortgage instrument in the United Kingdom. Using list data on mortgage rates and data from the longitudinal British Household Panel Survey (BHPS) between 1991 and 1995, Leece performed an econometric analysis by applying a probit model. According to the results, age was the only borrower characteristic that was statistically significant to the choice and that

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with higher age, the probability of taking out an FRM was lower. Leece also detected a statistically significant time trend variable, which he admittedly found difficult to interpret. He proposed that the trend may reflect the supply side features of the mortgage market during this period of time when FRMs became more popular.

Sweden

Of those few studies that have been conducted on the Swedish mortgage market, the results have indicated the importance of income, financial literacy (Almenberg and Widmark, 2011) and education, risk aversion and household financial risk tolerance (Hullgren and Söderberg, 2013) as well as the influence of the media and bank advisors (Hullgren, 2010).

The Swedish housing market

From the mid-1960s to the mid-1970s, a lot of new housing was constructed in Sweden. New constructions were granted with housing subsidies until the early 1990s (Andersson and Abramsson, 2012). These housing subsidies in combination with a high inflation rate and tax laws made home ownership an excellent investment for most households until the early 1990s (Hendershott and Weicher, 2002). From the mid-1990s onwards, housing prices have risen sharply in Sweden, as they have in many other countries. Today, almost two-thirds of the population in Sweden lives in a privately owned house or a cooperative dwelling (the most common way in which to own an apartment in Sweden). During the period from 2002 to 2011, housing prices changed in absolute terms, and in 2002, the average price for a single- or two-family housing unit in Sweden was approximately 1.13 million SEK. By 2011, the average price exceeded 2 million SEK, an increase of 81 per cent. For cooperative dwellings, the price of an apartment increased 157 per cent on average during the same period.

Sweden, which does not have a subprime market, has experienced an increase in housing prices recently, which in turn has led to an increase in the indebtedness of

households. The average income-to-debt ratio of Swedish households increased from approximately 110 per cent in 2002 to 164 per cent in 2011. The high debt ratio is unevenly distributed: Looking at LTV ratios, the average ratio is 60 per cent for the whole stock.

Mortgages in Sweden are recourse loans, and the mortgage market is dominated by ARMs. Banks and mortgage institutes also offer FRMs; in Sweden, FRMs are defined as mortgages with an initially fixed period of at least one year. Although opportunities are available to take out ten-year FRMs (and sometimes even longer ones), two- and three-year FRMs and up to five-year FRMs are the most common lock-in periods. (For a description of the characteristics of the Swedish mortgage market in comparison to 16 other industrialised countries, see Tsatsaronis and Zhu, 2004).

Most mortgages have an initial (theoretical) repayment period of 30 to 50 years. However, in 2011, 65 per cent of all new loans were unamortised and on national level, the actual repayment periods were 70 years (Swedish Financial Supervisory Authority [FI], 2012). This has contributed to a situation in which Swedish mortgages are, more or less, "interest only", which has raised concern among national authorities. The rise in debt ratio that occurred between 2002 and 2011 coincided with the growth in popularity of ARMs (see Figure 1).
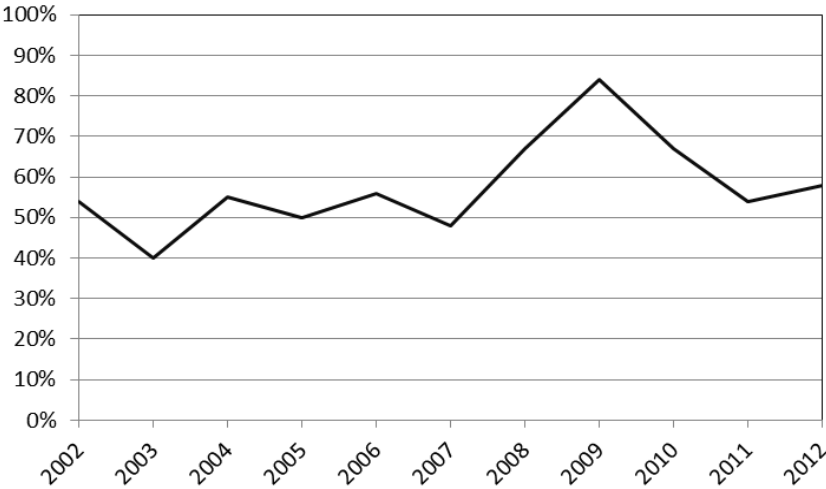

Figure 1. Share of adjustable rate mortgages (ARMs) for new mortgages on a yearly basis, 2002–2012. *Source:* Statistics Sweden, 2013.

High levels of ARMs have been perceived as a potential source of economic and housing market instability in the United Kingdom (Vickery, 2006), a country with a mortgage market resembling that of Sweden (Campbell, 2013) in many aspects; for example, both have high prepayment penalties, have similar average initial fixed periods and are ARM dominated).

Mortgage levels have fluctuated in Sweden during the past decade. Two major increases can be observed: from Q1 2006 to Q3 2008, the list ARM doubled; and, more recently, from Q1 2010 to Q3 2011, it tripled (see Figure 2). ARM levels have been lower than FRM levels for most of the period. One exception is the period from August 2011 through the spring of 2012 (the spring of 2012 coincides with the time period that the survey for the present study was carried out). The rate gap was, however, very small.
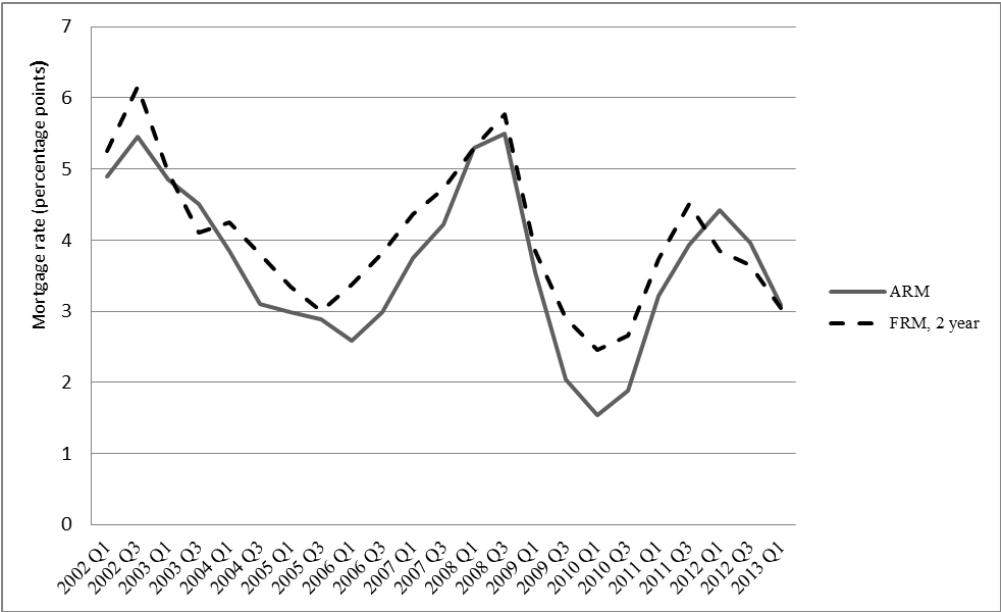

Figure 2. Mortgage interest gap 2002 Q1–2013 Q1. (ARM, adjustable rate mortgage; FRM, fixed rate mortgage). *Source:* Swedish Housing Finance Corporation (2013).

Data and methods

The data used in the present study were collected through a survey that was conducted from 27 March 2012 to 4 May 2012. The survey was distributed among a randomised

representative sample of Swedish citizens by an independent market research institute, TNS/SIFO International, to its Web panel. This Web panel consists of participants recruited by telephone so as to ensure a representative sample of the Swedish population. To control for changes in interest rate and other external factors affecting contract factors, a time limit was purposely set. We decided that only respondents who had made an active decision concerning their mortgages (e.g. made adjustments in existing mortgages or signed on for new ones) in the three months leading up to their participation in the survey were to be part of the sample and that, owing to survey costs, a limit would be set at approximately 500 individuals.

The survey was distributed to 7,738 Web panellists, of whom 2,927 answered the survey, yielding a response rate of 38 per cent. Of these panellists, 2,426 were screened out because they did not comply with the survey inclusion criteria. Thus, 501 respondents were included in the study, an incidence rate of 17 per cent. However, the response rate is not relevant because of the time criterion set for the project.

The Web survey was answered completely by 501 individuals aged between 25 and 79 years. Because all respondents were homeowners, this explains why the lowest age (25 years) was relatively high. The mean age was 50.8 years.

A slightly higher percentage of respondents were men (57.7 per cent men vs. 42.3 per cent women). This finding may be explained by the fact that the decision to obtain a mortgage is generally a family affair; that is, the decision is made jointly by the homeowners. Although a higher number of males answered the questionnaire in the present study, this is not really an indicator of sole property ownership.

The percentage of respondents with an education level of 12 years or less was 34.9 per cent. Only 0.2 per cent reported not having finished 9 years of education, and the average length of respondents' education was 13 to 15 years. For the purpose of comparison, 87 per cent of the Swedish population between 25 and 64 years has at least 12 years of education

(Organisation for Economic Co-operation and Development [OECD], 2010), whereas the average for OECD countries was 74 per cent.

The average income among the respondents was between 35,000 SEK and 41,999 SEK per month, which is higher than the average Swedish household income of 22,000 SEK per month in 2010.

An average LTV of 53 per cent was calculated for the survey sample. This percentage is lower than the 2010/2011 average of 60 per cent within total Swedish loan stocks and of 70 per cent for only new Swedish loans (Swedish Financial Supervisory Authority [FI], 2012).

Of the original 501 respondents, 3 were excluded because of abnormal data. Thus, the results of this study are based on the answers of 498 respondents. Because the number of respondents who were excluded was small, the normal distribution of responses was not affected.

A binary logistic regression was performed to assess the correlation of a number of contract factors and consumer characteristics and consumer perceptions of factors influencing mortgage choice. From the total number of 30 questions in the questionnaire, 4 questions concerning contract factors and background information and 10 questions about consumer perceptions were selected for further analysis, together with the question on mortgage choice. The constructs used in the regressions are presented in Table 2.

Table 2. Variables used in the regressions.

Variable	Definition	Mean	S.D.
MChoice FRM (dependent)	A binary variable indicating whether a loan taker has chosen mostly FRM or not. ≥75% FRM = 1 All others = 0	0.46	0.499
LTV	A continuous variable indicating Loan-to-value ratio.	0.53	0.499
INC	A variable illustrating income in SEK/month after taxes and including subsidies. <22.000 = 1 22.000-41.999 = 2 ≥42.000 = 3	2.35	0.655
EDU	A variable illustrating respondents' level of education: No completed education = 1 9 year = 2 11-12 years = 3 College studies up to Bachelor degree = 4 Master degree or more = 5	3.98	0.940
AGE	A variable illustrating the respondents' age, ranging from 25 to 79.	50.82	12.926
SAFEINVEST	A variable indicating the respondent prefer safe investments before taking risks with household finances: Do not agree at all = 1 Agree totally = 7	4.65	1.593
RESTRESOUR	A binary variable indicating restricted resources as lack of ability to handle sudden increases in mortgage costs: Would not manage mortgage payments if mortgage rates increased by 5 percentage points = 1 All others = 0	0.05	0.214
IMPofOWNEXP	A variable indicating the respondents' rating of importance of own experience in home buying for mortgage choice: Not at all important = 1 Very important = 7	3.92	2.010
IMPofMEDIA	A variable indicating the respondents' rating of importance of media for mortgage choice: Not at all important = 1 Very important = 7	3.57	1.716
IMPofADVISOR	A variable indicating the respondents' rating of importance of advisor for mortgage choice: Not at all important = 1 Very important = 7	3.89	1.742

The dependent variable of mortgage choice (MChoice) is derived from three multiple-choice questions in which the respondents were asked how large a part of the total amount of their mortgage loan was an ARM or an FRM. Their answers indicate whether the mortgage loan was either equal to or more than 75 per cent FRM (1) or less than 75 per cent FRM (0). The explanatory variables in the model are as follows:

The LTV ratio is constructed as the answer to a question on mortgage amount divided by the estimated market value.

From a list of 16 income categories, the respondents were asked to select the one that was applicable to their income level. The variable of income (INC) is constructed as three

aggregate categories: incomes lower than the Swedish average of 22,000 SEK/month, incomes of wealthier consumers and incomes of very wealthy consumers.

The variable of education (EDU) is constructed as the respondents' answers to a question with five alternative answers, ranging from no fulfilled level of education to a master's degree or higher.

Age (AGE) is tested as a continuous variable, with a lowest reported age of 25 years and a highest of 79 years.

The respondents were asked to rate their level of agreement to a statement about their preference for making safe investments over taking risks with household finances (SAFEINVEST) on a 7-point Likert-scale (1 = "do not agree at all" to 7 = "agree totally"). Risk type was not specified in the material, and the respondents provided answers based on their own attitudes towards risk taking in general.

RESTRESOUR singles out individuals reporting that they would not be able to pay their mortgages given a sudden increase in mortgage costs. The variable is based on answers to a multiple-choice question on how an increase of five percentage units in the mortgage interest rate would influence the ability to continue paying the mortgage.

From the statements concerning perceived influence on mortgage choice included in the questionnaire, three selection variables were constructed. They are all bipolar measures coded on a 7-point Likert scale anchored with the end points "not very important" and "very important". The factors were the following: [1] IMPofOWNEXP, respondents' answers regarding the importance of their own experience in home buying on mortgage choice; [2], IMPofMEDIA, respondents' answers regarding the importance of the media on their mortgage choice; and [3], IMPofADVISOR, respondents' answers regarding the importance of bank advisors' ideas on their mortgage choice.

Results

The model contains 10 independent variables (LTV, INC, EDU, AGE, SAFEINVEST, RESTRESOUR, IMPofOWNEXP, IMPofMEDIA and IMPofADVISOR). This model, which contains all predictors, is statistically significant, χ^2 (9, $n = 498$) = 69.752, $p < 0.001$, indicating that the model as a whole distinguishes between the respondents who chose mostly FRMs and all others (See Table 3). The model as a whole explains between 13.1 per cent (Cox and Snell R^2) and 17.5 per cent (Nagelkerke R^2) of the variance between the groups and correctly predicted 54.2 per cent of cases.

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

	B	S.E.	p	Odds Ratio	95% C.I. for Odds Ratio	
					Lower	Upper
LTV	1.060	0.404	0.009**	2.887	1.307	6.378
INC	-0.369	0.153	0.015*	0.691	0.513	0.932
EDU	-0.216	0.104	0.038*	0.806	0.657	0.988
AGE	0.025	0.009	0.003**	1.026	1.009	1.043
SAFEINVEST	0.140	0.062	0.024*	1.151	1.019	1.300
RESTRESOUR	-1.326	0.510	0.009**	0.266	0.098	0.722
IMPofOWNEXP	-0.180	0.050	0.000**	0.835	0.757	0.922
IMPofMEDIA	-0.220	0.060	0.000**	0.802	0.713	0.903
IMPofADVISOR	0.209	0.060	0.000**	1.233	1.097	1.385
Constant	-0.224	0.847	0.072	0.799		

Note. The dependent variable is MChoice. The number of observations is 498. The Cox and Snell R^2 is .131; the Nagelkerke R^2 is .175. **=Statistically significant at the 0.01 level (2-tailed). *=Statistically significant at the 0.05 level (2-tailed).

As shown in Table 3, all the independent variables make a unique contribution (statistically significant estimated parameters) to the model (LTV, INC, EDU, AGE, SAFEINVEST, RESTRESOUR, IMPofOWNEXP, IMPofMEDIA, and IMPofADVISOR).

The strongest predictor of choosing mostly FRM is RESTRESOUR, with an odds ratio (OR) value of 0.266. The result indicates that respondents with restricted resources are almost 4 times less likely to choose FRMs than those stating that they would not have problems paying their mortgages if mortgage rates were to increase, controlling for all other factors in the model. The OR value of the predictor LTV is 2.887. This result indicates that respondents with higher LTV levels are almost 3 times more likely to choose FRMs than those with lower

LTV levels, controlling for all other factors in the model. The OR value of the predictor INC is 0.691, indicating that respondents with higher incomes are almost 1.5 times less likely to choose FRMs. The OR values of the predictors IMPofMEDIA and IMPofADVISOR are 0.802 and 1.233, respectively, indicating that respondents influenced by the media are less likely to choose FRMs, whereas those influenced by advisors are more inclined to choose FRMs.

A test of the relationship between the independent variables showed no violation of the multicollinearity assumption. To check the robustness of the results, we controlled for the impact of the following factors on mortgage choice: average housing prices in the respondents' residential areas and the time since the loan was originally granted and whether or not the household amortised its loan. We also tested for the possible effects of gender, number of children and financial literacy factors. None of these factors significantly influenced the results. It can be noted that 62 per cent of the respondents were able to correctly answer all four questions testing for financial literacy in the specific area of mortgages.

Table 4 summarises the results of the present study and the correspondence with the proposed hypotheses (the null hypothesis being no impact on the dependent variable).

Table 4. Summary of results.

	Hypothesis	Supported/Rejected
H1	Respondents with a loan-to-value ratio higher than 0.5 will be more inclined to choose mostly FRM.	Supported
H2	Respondents with lower incomes are more likely to choose mostly FRM.	Supported
H3	Respondents with lower education are more likely to choose mostly FRM.	Supported
H4	Older respondents are less likely to choose mostly FRM.	Rejected
H5	Respondents that express a high level of risk aversion are more likely to choose mostly FRM.	Supported
H6	Respondents in households with low risk tolerance are more likely to choose mostly FRM.	Rejected
H7	Mortgage choice is affected by respondents own experience of earlier home purchases.	Supported (less FRM)
H8	Mortgage choice of respondents is influenced from media.	Supported (less FRM)
H9	Mortgage choice of respondents is affected by bank advisors.	Supported (more FRM)

Analysis and conclusions

The data presented here are derived from a national survey distributed in 2012 to a representative sample of the Swedish population. The aims of the survey were to investigate driving forces behind borrowers' mortgage choice and to compare the findings from this Swedish case with those reported in other countries. In the present study, we also set out to explore other factors that, to our knowledge, had not been previously well examined: the influence of bank advisors and the media on borrowers' mortgage choice.

This empirical study investigates the effects of a number of contract factors and consumer characteristics and other factors on consumers' mortgage choice. In 2012, the mortgage rate gap was almost negligible in Sweden, thus giving us an opportunity to examine a number of other factors. We hypothesised that being older and having a high LTV ratio, low income, low level of education, high risk aversion and low financial risk tolerance would influence Swedish home loan borrowers to choose mostly FRMs. The effects of the rated

importance of previous mortgage experiences, the media and bank advisors perceived by the homebuyers as influencing the mortgage choice are all hypothesised as non-directional.

This study gives support to the hypotheses (thereby rejecting the null hypotheses) that being older and having a high LTV ratio, lower income, lower level of education and high risk aversion positively affect the choice of FRMs. These findings are in line with those of Sa-Aadu and Megbolugbe (1995), Leece (2000), Duffy and Roche (2005) and Fortowsky *et al*. (2009). In these aspects, the Swedish mortgage market seems to be driven by the same factors as other mortgage markets.

Two variables have an inverted relationship with the dependent variable compared to what was hypothesised: Higher age predicts more FRMs, which is in line with studies by Sa-Aadu and Megbolugbe (1995) and Paiella and Pozzolo (2007) but contrary to findings from the UK (Leece, 2000). In a Swedish context an explanation can be that the risk premium paid for an FRM is considered low by the baby-boomers, in light of the fact that they have experienced much higher mortgage rates during earlier decades. The reporting of households with low financial risk tolerance has a negative effect on the dominance of FRMs. One explanation could be that ARMs were marginally less expensive than FRMs during the investigated time period and that households were not prepared to pay the risk premium inherent in FRMs.

Our findings also show that the following factors are drivers of mortgage choice: consumers' personal experiences in home buying, the influence of the media and the influence of bank advisors. The first two factors have a negative effect on the choice of FRM dominance, whereas the last factor is a driver for FRMs. Hullgren (2012) showed in a Swedish setting that bank advisors assist their mortgage customers by recommending that they split their loans, and the results of the present study support that finding. Interestingly, both the media and bank advisors have the potential to play influential roles in a broader

policymaking perspective. Therefore, it is important to follow up more extensively the impact of these factors on consumers' banking choices.

The most vulnerable Swedish consumers seem to choose FRMs to a greater extent than those who are less vulnerable and, in so doing, avoid obvious liquidity risks and risks on an aggregate level. The market seems to function fairly well in Sweden, perhaps partly owing to recourse mortgages and the absence of a subprime market. Thus, there seems to be no need for further legislation at present. However, it should be of interest to policymakers and the industry to explore in greater depth how consumers perceive themselves as being influenced in their mortgage choice. In particular, the roles of the media and financial advisors need to be further studied because they have the potential to impact economic stability.

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