

Are Lenders Using Risk-Based Pricing in Consumer Loan Market? The effect of the crisis.*

Silvia Magri [†]

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Abstract

The aim of this paper is to verify whether in Italy the prices of consumer loans, such as loans to purchase cars, furniture or for other not specified purposes, are based on the *specific* risk of the borrower. This issue is important because mispricing could threaten financial stability through negative effects on lenders' profitability; discrimination in prices also leads to a more efficient allocation of credit through less rationing and lower prices for low-risk borrowers who are hence more able to smooth their consumption. By using data available in the biennial Survey of Household Income and Wealth since 2006, the evidence is that the price of consumer loans is more risk-based after the 2008 financial crisis. Household economic and financial conditions (wealth, number of income earners, education as a proxy of permanent income) become significant and economically important in influencing the interest rates during 2010-2012. These are also the most important drivers of the probability that a borrower is delinquent on consumer loans. As a consequence of the crisis, lenders have therefore paid more attention to the borrowers' credit risk not only in the selection process, but also in deciding the price of the loan. Another result, relevant for financial education, is that when households search for better terms of the contract, they indeed get lower interest rates. Finally, we find that in rejecting borrowers lenders are very careful on the same economic and financial conditions influencing the probability of delinquency, though the rationing rate is still very high for households with young head (<35) who, *ceteris paribus*, are not more delinquent.

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[†]Bank of Italy, Department for Financial Stability - Financial Structure and Intermediaries Division.
E-mail:silvia.magri@bancaditalia.it

1 Introduction

Risk-based pricing is the practice of lenders who charge each borrower, or each class of borrowers, an interest rate based on a measure of his specific credit risk. In principle, interest rates applied to borrowers should reflect their default risk (Geanakoplos, 2002; Chatterjee, Corbae, Nakajima and Rios-Rull, 2007); this has positive effects on lenders' profitability and access to credit market. However, there are limits in the application of this price strategy. If there is high asymmetric information and lenders cannot discriminate among borrowers, when they increase interest rates too much, they end up attracting the riskiest borrowers (adverse selection). In this case it is rational to fix an upper-bound for the interest rate and reject the applications of the borrowers who are *perceived* as the riskiest (Stiglitz and Weiss, 1981). Even when asymmetric information can be reduced with the use of credit scoring models, there are still some limits to the possible increases in interest rates related to borrowers' affordability and usury laws. Hence, the riskiest borrowers could be nevertheless left out of the market, though they are better identified thanks to more detailed information.¹

The aim of this paper is to evaluate the use of risk-based pricing in the market for consumer loans different from mortgages, such as loans to buy cars, furniture or to finance other expenditures. This is an important question because mispricing could threaten financial stability through negative effects on banks' profitability that have been vivid during the sub-prime loans' crisis. Better pricing also leads to a more efficient allocation of credit through less and more tailored rationing and lower prices for low-risk borrowers that can induce them to take up credit and smooth more their consumption. We focus on consumer loans different from mortgages because this is the segment of the credit market for which lenders have been less willing to adopt risk-based pricing strategy due to the high incidence of the costs of credit scoring on loans of small amount. Even in the US, Edelberg (2006) finds that risk-based pricing was increasingly adopted for mortgages, but less used on other consumer loans. Moreover, we have already uncovered that in Italy lenders have been increasingly using risk-based pricing for mortgages (Magri and Pico, 2011).

Our focus is also on understanding the impact of the crisis in the use of risk-based pricing for consumer loans. The negative effects of mispricing on financial stability have become clearer during the 2008 financial crisis and the natural consequence is that lenders have paid more attention to the borrowers' risk, even for loans of small amounts (Cristaudo, Magri, Pico and Zavallone, 2014)

Italy is an interesting case study. At the beginning of the last decade the size of the market for consumer loans was much smaller compared with other European countries.

¹Getter (2006) argues that these households are income constrained more than credit constrained.

Then this market increased sharply until 2008 thanks to positive economic conditions and reductions in interest rates, and is now comparable in size to those of the other main European countries (Figure 1). However, interest rates are still much higher than in other euro area countries: more than 1 percentage point on new loans before the crisis and more than 2 points after the crisis.² Do these higher interest rates depend on the borrowers' specific credit risk or on more general background risk, linked for example to the area of residence of the household? In the latter case, some good borrowers that could use credit to smooth consumption, with positive effects on the economy, would not due to the higher prices compared with their intrinsic level of risk; on the contrary, bad borrowers would benefit of lower rates with respect of those adjusted for their actual riskiness and this could be detrimental for banks' profitability. Hence, the analysis of this topic is particularly worth in Italy.

Italy also offers nice data for the analysis. In the biennial Survey of household income and wealth (SHIW) since 2006 households are asked about the interest rates charged by lenders to consumer loans. The set-up is very useful as the survey also collects a fair amount of data about household financial and economic conditions and other demographics. This allows us to model the interest rates as a function of different household characteristics that are considered as proxies of its specific credit risk, essentially the risk of being late in payment and ultimately the risk of default

We find that the pricing of consumer loans is more risk-based after the crisis. The model explaining the interest rates with household characteristics, proxies of credit risk, accounts for a much higher variance of the rates in 2010-2012 than in 2006-2008. Moreover, household economic and financial conditions (wealth, number of income earners, education as a proxy of permanent income) become significant and economically important in influencing the interest rates during 2010-2012; on the contrary, the residence in Southern regions is no longer relevant and hence this measure of background riskiness loses power. Wealth, number of income earners and education are also among the most important determinants of the probability of being delinquent on a consumer loan. All in all, it seems like after the crisis lenders are focusing more on the drivers of the specific credit risk of the borrower to decide the price of a loan. Searching for a better contract is also important in getting lower interest rates.

The results are confirmed with the Heckman model where selection is taken into account, i.e. the fact that interest rates are observed only for households who have a consumer loan. Finally, in the last part of the paper we also extend the analysis to the probability of having a consumer loan, which is widely influenced by many household

²On the contrary, the spread between interest rates on new mortgages in Italy and other euro area countries was on average nil between 2003 and 2014; negative before the crisis and around 0.5 points after the debt sovereign crisis.

characteristics. Some of this evidence depends on supply equation, i.e. on variables that matter in the rationing equation, and not in the demand side of the market. In rejecting borrowers, lenders pay great attention to the same household economic and financial conditions influencing the probability of delinquency and that matter for interest rates after the crisis. The rationing rate is nonetheless very high for households with young heads (<35) though young age is not important in determining the frequency of delinquency, after taking into account household economic and financial conditions. It seems like for young households there is still a fair amount of rationing in consumer loan market not justified by their credit risk.

In the theoretical literature most related with this paper there is consensus on the idea that interest rates applied to borrowers should reflect their default risk (Geanakoplos, 2002; Chatterjee et al., 2007; Einav, Jenkins and Levin, 2012; Livshits, MacGee and Tertilt, 2011). However, the empirical literature on household credit market has mainly focused on the rationing (Jappelli, 1990; Runkle, 1991; Duca and Rosenthal, 1993). The evidence on the risk-based pricing on consumer loans is still scant and almost confined to the United States. Even in the United States, as late as the early 1990s most providers of consumer credit simply offered one single interest rate for each type of loan and rejected most high-risk borrowers (Johnson, 1992; Edelberg, 2006). During the 1990s, following a drop in data storage costs and an improvement in the techniques of scoring (Bostic, 2002), lenders started to estimate the specific default risk of each borrower in order to better assess the price for consumer loans. Edelberg (2006) studies the spread between the price to the high- and low-risk households in the United States in the second half of the 1990s: she finds that the component of risk of the price has increased in the households' loans market, but only for collateralized credits such as mortgages and car loans; the results for unsecured loans are much less clear. Getter (2006) also finds evidence of risk-based pricing in the US credit card market.³ In this paper we turn our attention to Italy where the adoption of credit scoring model started much later than in the US and was for a long time confined to business loans.⁴⁵

This paper also contributes to the literature on the importance of financial education in avoiding errors or extra-costs (Disney and Gathergood, 2013; Agarwal, Chomsiseng-

³McCorkell (2002) shows that in the US the use of credit scoring has improved the evaluation of loan applications across the population and has increased the access of households traditionally under-served in the credit market. The high-risk applicants would indeed receive credit that they would not otherwise be given under the rule of a "single house rate", albeit at a higher price. The low-risk consumers would be charged a lower rate and not partially subsidize high-risk customers as in the "one house rate" case.

⁴Bofondi and Lotti (2006) show that at the beginning of the '90s, the diffusion of this technology was still at an early stage in Italy, mainly because of a heavy use of "soft", i.e. qualitative, information, which made the adoption of automated credit scoring techniques more difficult.

⁵As for business loans, Panetta, Schivardi and Shum (2009) find that in Italy, after a bank merger, which should increase the information about customers and the bank ability to screen borrowers (i.e. reduce adverse selection), the relation between the default probability of each firm and its loan rate becomes steeper.

phet, Liu and Souleles, 2006) as we find that a household searching for better financial terms of the contract can pay almost 40 basis point less, in line with the results found by Getter (2006) for the Us. Another stream of related literature has tried to measure the price elasticity of household demand for credit (Gross and Souleles, 2002; Alessie, Houchguertel and Weber, 2005). These papers find that the elasticity of demand to the price of credit is lower for constrained households or, more in general, for households facing financial difficulties. Hence, this is an evidence that, if lenders do not have enough information on their borrowers, when they increase interest rates they end up attracting the riskiest borrowers whose demand is less elastic to price.

The rest of the paper is organized as follows. Section 2 presents the data, while Section 3 focuses on the estimation strategy. Sections 4, 5 and 6 comment the results of the analysis, and Section 7 discusses them and concludes.

2 Description of the data

The biennial Survey of Households' Income and Wealth (SHIW) contains information on consumer loans with the following breakdown: a) loans for the purchase of motor vehicles, b) loans for the purchase of furniture and appliances and c) loans for non-durable goods (holidays, education, other expenditures). Starting from 1989, households were asked about the outstanding amount of debt at the end of the year; since 2006 the questionnaire also recollects an indication of interest rates charged by lenders.⁶ We have therefore data on interest rates for four consecutive surveys (2006, 2008, 2010 and 2012) though the framing of the question changed overtime with an important impact on the number of missing answers.

In 2006 households were asked to declare either the specific level of interest rates charged or approximately a range in which the interest rate is included.⁷ In 2008 and 2010 households were asked to report only the level of interest rate allowing for a missing answer (i.e. not answering this question would allow the interviewer to go ahead with the questionnaire), while in 2012 the missing answer was not allowed, meaning that households need to look up in the papers when they cannot recollect the figure. The effect of the framing of the question is that we are able to match an interest rate to each

⁶If more than one debt has been contracted within one of the three categories, households are asked to refer to the largest loan. Some households have a loan in more than one of the three categories: to obtain one interest rate per household, we calculate a weighted average with weights equal to the amounts of each loan. The SHIW contains detailed information on income, consumption, wealth and social, demographic and economic characteristics of a sample of approximately 8,000 households; it is also rich in questions on households' debt. For a comparison between the SHIW, national accounts and financial accounts, see Brandolini and Cannari (1994).

⁷ The classes of interest rates, among which households who indicate a range can choose, are the following: 0-6 per cent, 6-9 per cent, 9-12 per cent, 12-15 per cent and more than 15 per cent. For the households who choose to declare a range, we recover a point indication of the price of the loan by using the probability of a uniform distribution inside each class of interest rates.

household with a consumer loan for the 2006 and 2012 surveys, while for the 2008 and 2010 surveys more than 50 per cent of the indebted households do not provide any rate. We tackle this problems repeating our estimations only for the years when there are no missing interest rates. Other methods of imputations for our main variable of interest, based on households' characteristics, would strongly bias the results in favour of finding a link between interest rates and household credit risk; hence, we prefer to work with raw data.

There is a further caveat in using survey data for this kind of analysis. The interest rates reported in the SHIW are those that households remember if they do not look them up in the documents. These data can therefore be affected by recollection problems and measurement errors. In order to have a more precise indication of the interest rate offered by lenders, we could have used administrative data gathered directly by credit institutions. However, these data are not easily available and, should they be available, their important drawback would be the lack of detailed information on many households' characteristics that are viceversa in the SHIW.

In order to evaluate the quality of the data, and hence the impact of missing data and measurement errors, we compare the average interest rates from the SHIW (excluding zero interest rates) with those reported by lenders in the supervisory reports in the same year of the survey. The evidence is reassuring: there are some differences, in the range of 0.5 percentage points, which are lower in the years when all households answer the question (Figure 2).⁸ All in all, we think the interest rates in the SHIW are a good representation of the cost of consumer loans in the different years of the analysis.

In table 1 (upper panel) we report descriptive statistics on interest rates in SHIW for each survey with the corresponding number of households declaring interest rates. The average interest rate on consumer loans shows a slight downward trend, from 6.4 per cent in 2006 to 6.1 per cent in 2012. The higher coefficient of variation in 2012 is an indication of greater dispersion of interest rates, which was nonetheless even higher in 2006. In this paper we are not interested in the dispersion of interest rates per se, while we want to understand if the dispersion of interest rates is explained by different level of borrower's specific credit risk. In the other panels of the table we report some descriptive statistics for the regressors used in the estimations, most of which are categorical variables

Given the question we want to address in this paper, we exclude from the analysis the households declaring zero interest rates as this level of rates is normally decided by dealers and not by lenders. When a household declares a zero interest rate, financial costs are indeed entirely borne by dealers. Bertola, Hochguertel and Koeniger (2005) argue that

⁸As a percentage of the average interest rate in SHIW, the difference between average rates reported by households in SHIW and average rates reported by lenders has an incidence of 6-7 per cent in 2006 and 2012 (the years with no missing rates), 12 per cent in 2010 and 16 per cent in 2008; the evidence with median value of interest rates is similar.

dealers can sometime have an incentive to bear these costs in order to discriminate their borrowers so as to offer different prices to cash-rich and liquidity constrained households. Zero interest rates on consumer loans are not a rare event for Italian households: the fraction declaring a zero rate was 9 per cent in 2006 and increased to 15 per cent in 2012. In order to have an understanding of this phenomenon, we analyse which borrowers are more likely to obtain a zero interest rate. In an unreported estimation, we find that the probability of zero rate is much lower for low-wealth households, when the head has an uncertain job or is an immigrant; it is also decreasing in the amount of the loan. Overall, it seems that the benefits of zero rates go primarily to more affluent households and for loans of small amount.

3 Estimation strategy

In estimating the impact of the specific borrower’s risk on the interest rate charged by lenders on consumer loans, we follow a setup similar to the one proposed by Edelberg (2006). Assume that a household demands a loan amount A_i with maturity M_i and offers collateral to ensure a recovery rate l_i . After considering these loan attributes, the borrower’s default risk d_i and his costs of funding c , the lender decides whether or not to accept the application and then offers an interest rate I_i to the household. The household signs the contract if the offered rate I_i is lower than his reservation interest rate R_i , based on his characteristics and on the loan attributes A_i , M_i and l_i .

In this case, we therefore observe the interest rate I_i charged by the lender to the household i

$$I_i(d_i, A_i, M_i, l_i, c) = X_i\gamma + \epsilon_i \quad (1)$$

where X_i is a vector of variables that are measures or proxies for d_i , A_i , M_i , l_i , c . The borrower’s default risk d_i is the focus of our estimation.

We follow the strategy of testing the explanatory power of all the variables that other studies find important in explaining the borrowers’ default risk (Edelberg, 2006; Magri, Rampazzi and Pico, 2011; Tudela and Young, 2003). In a following section of the paper we also verify if the same variables are relevant in influencing the probability of arrears on consumer loans in Italy, the only negative event measured in the SHIW. In detail, we start with a baseline and parsimonious specification with only household net wealth (quartiles) and the age of the household head (classes) as a measure of borrower’s credit risk. We also tried to include household income (quartiles), though the correlation with wealth is quite high (more than 0.3): this entails a change in the sign of coefficients and unexpected results when the two main variables capturing household economic conditions are included together. We hence decide to keep household wealth and capture the impact

of income through other controls that are less correlated with wealth.

In a richer specification we add more social, economic and demographic household characteristics as a proxy of credit risk, such as being married, being a self-employed, and the number of income earners, which proxy for income variability and level.⁹ We add dummies for being immigrant and having an uncertain job¹⁰, that also proxy for high uncertainty of income that can translate in higher credit risk, and different classes of education to control for expected income; as a final control, we include the sex of the household head. In all specifications, we also include a dummy for living in large municipalities (>500,000 inhabitants) and regional dummies; we sometime report in the tables, as memo items, the coefficients of the area dummies (Center and South): though the regressions with area dummies have a lower explained variance than those with regional dummies, the coefficients of area dummies are easily readable. In order to understand what are the local features influencing the pricing of loans, in some estimations we include indicators of the quantity of the loan recovered and the time for recovery in the case of borrowers' default (at regional level), the length of civil trials (at provincial level) and a variable capturing the incidence of bad on total loans (at provincial level). The first two variables are a proxy of l_i , the expected recovery rate of the loan.¹¹

We finally add in the specification some controls related to the contract or the relationship with the bank. Most of consumer loans are granted at a fixed interest rate;¹² it is hence important to verify the possible correlations of the fixed rate with the initial amount of the loan and the original maturity (A_i , M_i). However these variables are available only since the 2010 SHIW; in the more general specifications we just add the residual amount of the loan which is available in all surveys. We also include a dummy equal 1 for households who, in choosing the contract, search for lenders who offer better financial conditions.¹³ As a final proxy of credit risk, in this case related to the contract as well as to household characteristics, we add an indicator of high debt-income ratio

⁹The correlations of these variables with the dummy for the first quartile of net wealth are lower, between -0.10 and -0.14.

¹⁰For measuring uncertain job, we include a dummy equal to 1 for those employees that have fixed-term contracts and those self-employed that have non-standard contracts such as occasional collaborations, works on a single project, etc. For more details on the variables used in the estimations see the Appendix.

¹¹Due to the high correlation of these indicators with regional or area dummies, we need to drop the latter. Indicators related to the loan recovering process are measured using a Bank of Italy questionnaire answered by a representative sample of Italian banks. The indicators refer to the years 1992-93 and are measured at regional level (20 regions). The length of civil trials is provided by the Ministry of Justice and refers to the period 1995-1998. For these indicators of the enforcement of the contract we want to use predetermined values in order to reduce possible endogeneity problems. The incidence of bad to total loans is from supervisory reports and refer to the specific years under analysis.

¹²Around three quarters of the contracts are granted at fixed interest rates over the period under analysis.

¹³Since 2006 households are asked why they choose the bank that granted them the consumer loan. The possible answers are: 1) it is the unique bank that granted me the loan 2) it is the bank that offered better *financial* conditions compared to competitors 3) it is the bank that offered better *non financial* conditions (for example faster application) 4) it is the first bank I asked for the loan. More than 40 per cent of households choose the bank using the second criterion (Table 2).

(dummy equal 1 if debt-income is in the highest quartile of the distribution for each survey.).

As for the other variables used in the estimation, the cost of funding for the lenders c is assumed constant over a year and is captured by year dummies. As another variable measuring bank costs, and more in general the bank market power, we also include in some specifications an indicator of banking concentration in the local credit markets measured by the Herfindahl index, based on the number of bank branches in the 95 Italian provinces.

However, the interest rates are observed only for households who have a consumer loan and this selection bias needs to be taken into account. Formally:

$$Prob(consumer - loan) = \Theta(Z_i\beta) \quad (2)$$

the probability of having a consumer loan is a function of a vector of variables Z that help predicting whether the interest rate I_i is observed, i.e. whether the household i has a consumer loan. This vector Z contains both factors influencing the demand attitude towards consumer loans and variables affecting the lenders' decision about the loan application made by the household. A household who has not a consumer loan could be either one who is not interested in having such a kind of loan (demand effect) or one who has asked for a consumer loan, but was turned down by the lender (supply effect, i.e. credit rationing).

In this framework, in order to verify the results we use a sample selection model for the estimation in (1). To identify the model we need to find at least one variable that is in Z_i and not in X_i . Edelberg (2006) uses some variables capturing the demand attitude towards debt, i.e. whether households consider borrowing to be good, bad or simply acceptable and whether they believe borrowing is acceptable in certain circumstances, such as to cover for a loss in income or to buy a house. We do not have such kind of variables in the SHIW. As an exclusion restriction, we hence use a dummy equal to 1 for households who face difficulties to have ends meet with their disposable income: this variable is significant in the probability model for having a consumer loan, though - as a private information of the household - it cannot be used by lenders in determining interest rate and, indeed, has no explanatory power in the price equation.

4 The price of the loan and the household credit risk

4.1 OLS estimations

In this section we comment the results concerning the pricing strategy of consumer loans. The baseline estimation reported in the first column of Table 2 for the whole period (2006-2012) shows the importance of household wealth in influencing the price

of the loan. Including more household characteristics, proxies of its credit risk, barely increases the explained variance of the model (the R^2 goes from 0.044 to 0.048 in the second column of the table).

More interestingly, the last two columns of the table show an important change in the pricing strategy after the crisis. The variance explained when modelling the price of a loan as a function of proxies of borrower credit risk is much higher in 2010-2012 than in 2006-2008 (R^2 is 0.11 versus 0.07). Moreover, net wealth becomes significant and economically important in influencing the price of a consumer loan only in 2010-2012: *ceteris paribus*, households in the first quartile of net wealth pay 1.2 p.p. more than households in the highest quartile (those in the second quartile pay 0.8 p.p. more). After the crisis other proxies of the household economic and financial conditions become significant and economically relevant: having a college degree, a proxy for higher expected income, reduces the price of loans by 0.5 p.p., while one more income earner reduces it by 0.2 p.p. In the period 2010-2012 it also appears that young households (<44) pay less on consumer loans (around 0.6-0.9 p.p.) than aged household (>65).

This is a totally different pricing strategy than that applied by lenders before the crisis, when the most important determinants of the interest rates were related to the household residence, and therefore to a sort of a *background* and not a *specific* credit risk of the borrower. During 2006-2008, households living in a Southern region pay 1 p.p. more on consumer loans; a similar result is true for households living in large municipalities. An evidence more correlated with the specific borrowers' credit risk is that the uncertain job of the head entails higher rates (by 0.8 p.p.), while when the head is married interest rates are lower (by 0.5 p.p.). On the contrary, after the crisis lenders have directly focused on the borrower's economic conditions, such as net wealth, creating the possibility of more tailored prices for those who have uncertain jobs, a working-status that has been spreading in Italy, but acceptable or even good economic conditions.¹⁴

In table 3 we add to the previous specification some controls related to the loan contract and the relationship with the bank. These variables slightly increase the explained variance of the model and do not alter the previous results. In this specification we also include the initial amount of the loan and the loan maturity (both available since 2010) that could be correlated with the interest rates, though they are not, at least after the crisis. In the period 2006-2008 we are able to just include the residual amount of the loan as a proxy of the initial amount: we find that interest rates tend to be lower for loans of larger amount. Smaller loans are indeed more costly for lenders, when considering the

¹⁴The most important results, specifically those concerning net wealth, are confirmed when the same estimations are run only for the surveys 2006 and 2012 with no missing interest rates. In 2006 almost no variables are significant in the price equation, but the head with an uncertain job (0,9 p.p.) and regional dummies for Southern regions (0.9 p.p.; in 2012 belonging to the first quartile of net wealth is still highly significant and important (0.9 p.p.); similarly for the result on income earners.

fixed cost of processing the papers as a percentage of the amount of the loan, and riskier given that they generally lack collateral that is normally available only for loans of large amount used to purchase a vehicle. This is a sign that before the crisis the pricing was more related to the characteristics of the product rather than to those of the customer.¹⁵

An important result from this estimation is that households who search for better economic terms of the contract end up getting lower interest rates (by 0.4 points); this evidence is true across all periods and is very telling about the importance of financial education in avoiding mistaken choices.¹⁶ This is an interesting result given that indications on searching attitude are not widespread in the surveys and are sometimes inferred from other answers (Disney and Gathergood, 2013).¹⁷ Finally, *ceteris paribus*, there is no increase in interest rates correlated with a higher debt-income ratio.

4.2 Heckman estimations

In Table 4 we report the results of Heckman estimations accounting for sample selection. As mentioned in Section 3, we use as an exclusion restriction an indication about difficulties that households face to have ends meet: as a private information of the household, this variable do not enter the interest rates equation applied by lenders and indeed has no explanatory power in the interest rates equation.¹⁸

In order to get the convergence of the maximum likelihood Heckman estimation we have to include net wealth in level (first and second degree of wealth) rather than through categorical variables (quartiles). A Wald test, reported at the bottom of the table, never rejects the hypothesis that the two equations, the interest rate and the probability model for having a consumer loan, are independent; hence they can be estimated per se.¹⁹

As a consequence of this independence, the results of the interest rate equation, after considering the selection problem, are very similar to those reported in Table 3. Specifically, we still find that net wealth becomes significant in influencing the interest rate only after the crisis: in the last column of Table 4, referring to 2010-2012, interest

¹⁵The economic impact of the residual amount of the loan is nonetheless small: increasing the amount by 1 standard deviation (12,000 euro) reduces the rate by a bit more than 0.1 p.p.

¹⁶We also interact the search dummy with different household characteristics so that to understand whether financial literacy is more important for some specific categories of households. No indirect effects of such types are detectable.

¹⁷Getter finds that a great deal of shopping for best terms in the US reduces interest rates for mortgages and credit card, but not for auto loans. Disney and Gathergood (2013) find that in the UK financial literacy strongly reduces interest rates on consumer loans and interpret this result as a purely demand-side effect representing the efficiency of *search* for credit product on the part of the households. This is on the basis that financial literacy is not observable to lenders and so does not enter lender credit supply functions.

¹⁸This indication is captured by a dummy equal to 1 when households declare to have from some to great difficulties to have ends meet; this dummy has no explanatory power in the interest rate equation even when included just in the baseline equation with net wealth and age and no other household controls.

¹⁹The selection equation in the Heckman model considers only those households that have a consumer loan and report an interest rate; these are all households with consumer loans in 2006 and 2012, though for the surveys 2008 and 2010 part of them are not included as they do not indicate any interest rates.

rates decline with net wealth at a decreasing rates; also the other proxies for economic and financial conditions, such as education and the number of income earners, are relevant only in 2010-2012.

From the selection equation we get the evidence that many social, economic and demographic household characteristics are highly significant and economically important in influencing the probability to have a consumer loan. We will deepen this topic in Section 6 when we will also try to single out whether these household characteristics are important for supply or demand reasons in order to have a more comprehensive picture of lenders' attitude.

4.3 Extensions and sensitivity analysis

In this section we analyse some extension of the previous estimations and we try the sensitivity of the main results when changing some features of the regressions.

As an extension of the analysis, we want to evaluate what are the most important local factors explaining the relevance of living in Southern regions for the level of interest rates applied in the period 2006-2008, before the crisis. We have different possible explanations: enforcement costs of the loan contracts, i.e. the time required to recover a loan in case of borrowers' default or the length of civil trials, the incidence of bad on total loans, or the banking concentration as a proxy of bank market power in deciding interest rates. All these variables are higher in Southern regions. In Table 5 we just report the coefficients of these local factors in some specifications where we need to drop the regional and even the area dummies due to the high correlation (around 0.5-0.7 with the dummy South). In the first panel of the table we focus on the recovery of the loan, in the intermediate panel on the incidence of bad loans and in the last panel on the length of civil trials; in all specifications we always include also the index of banking concentration (Herfindahl). The evidence is that in the period 2006-2008 the local factors that can explain the higher interest rates in the Southern regions are the longer time for the recovery of the loan, the likely associated longer length of civil trials and the larger incidence of bad loans. As for the economic impact, the incidence of bad loans appears to be the most important factor.²⁰ The bank market power is never significant. None of these local features are relevant after the crisis, when lenders focus more on the specific credit risk of the borrower.

We then first verify the sensitivity of the results by windsorizing the highest values of the interest rates to the 1st and 99th percentiles of their distribution in each survey. All

²⁰When increasing the incidence of bad loans by 1 standard deviation, rates are 0.36 p.p. higher (around 0.23 p.p. higher when moving the variables connected with the time to enforce the contract); when the incidence of bad loans increases from the 5th percentile to the 95th percentile of the distribution, interest rates rise by 1 p.p. (around 0.7 p.p. when changing variables connected with the time of loan recovery.)

the previous findings are almost unchanged, specifically those concerning the importance of household net wealth in influencing the interest rates in the period 2010-2012. After the crisis it is also clearer that the oldest age classes (>55) pay higher interest rates than all the other age classes. The evidence that households searching for better conditions get lower interest rates is also widely confirmed for the whole period (Table 6 first two columns). Among the local factors significant before the crisis, the most robust is the the time required to recover a loan in the case of borrowers' default. We also try an unreported windsorization at the 5th and 95th percentiles, which is even too strong: also in this case the main result concerning the strong correlation of net wealth and the interest rates after the crisis still holds.²¹

Lenders evaluate the potential borrowers at the moment of the loan application, while before we have used the household characteristics at the time of the survey when borrowers report the interest rates. Although for some important household characteristics the change could be small or even nil, to take into account this fact we decide to use the values of the household characteristics, when available, in the previous survey given that we do not have specific indication about the year when the loan was granted and consumer loans have normally short maturity (less than 5 years, Table 1). The number of observations consequently decreases almost by half, to 1147 for the whole period (from 2112 in previous estimation).²² The most important evidence is unchanged (Table 6, last two columns). Specifically, the result about the relevance of net wealth in the period after the crisis is strongly confirmed: from this estimation even households in the third quartile of net wealth pay higher rates (by 0.7 p.p.) than the richest quartile; the oldest age class (>65) pay more than 1 percentage point than all the other age classes. In the period before the crisis (2006-2008) the evidence about the importance of having an uncertain job is magnified: the coefficient is highly significant and the effect on the interest rates is stronger than in previous estimations; this is true also for the importance of dummy areas.²³ In this specification, net wealth is mildly relevant even before the crisis: households in the second quartile of net wealth pay 0.6 p.p. more than the richest households in 2006-2008; nonetheless, we find no evidence of higher interest rates for households in the lowest quartile of net wealth.

In the previous estimations standard errors are clustered at a provincial level (95 provinces) to allow for possible correlations of the unobserved features at a local level. We try the sensitivity of the results when clustering standard errors at the household

²¹In the last specification, in the period 2010-2012 the other two proxies for household economic and financial conditions, education and the number of income earners, loose their significance in influencing the interest rates.

²²In the period 2006-2008 the number decreases to 648 from 1249; in the period 2010-2012 to 499 from 863. The search dummy available since the 2006 Survey has not been lagged.

²³The head with uncertain job pay 1.6 p.p. more versus 0.7 p.p. in estimations with contemporaneous values of the variables; the coefficient of the dummy South increases to 1.4 p.p. from 0.9 p.p.)

level to account for a possible correlation of the errors within the same household. In an unreported estimation the most important results are confirmed, specifically those concerning the relevance for the interest rates of the household net wealth after the crisis and of the household location before the crisis.

We also try an unreported estimation using median regressions to find out whether the lenders' decision about the interest rates on the typical (median) household is based on different features compared with those found before on the average interest rates. The main evidence about the importance of net wealth in influencing the interest rates after the crisis is unaffected; this is also true for the relevance of searching attitude in reducing interest rates over the entire period under analysis. Finally, we verify the results when considering only loans to buy vehicles to evaluate the importance of collateral (the vehicle)²⁴ and to narrow the analysis on loans with more similar characteristics. Overall, the main evidence is confirmed: the economic impact of net wealth on the interest rates after the crisis is similar to that estimated for all consumer loans.²⁵

5 The determinants of the probability of arrears

An important question that arises after this evidence is whether the variables we find important in influencing interest rates, specifically net wealth, are really affecting the probability of borrowers' default on consumer loans. We have focused on the household characteristics that the empirical literature has found important in capturing the household credit risk in consumer loans' markets, but it is crucial to find out their correlations with borrowers's default on consumer loans in Italy. In the SHIW, households are not asked about their default on loans, though there is a question on delinquencies longer than 90 days since the 2008 Survey.²⁶

In Table 7 we report the results of the estimation of the probability to be delinquent on a consumer loan as a function of the same household characteristics used in previous estimations. We also try the explanatory power of a variable measuring the difficulties the household faces to have ends meets in order to evaluate its impact on the credit risk; however, as this is a private information of the household, not available to lenders, we prefer to focus on the model without this variable (from second to fourth column in the

²⁴The parameter l_i , which measures the recovery rate in the model of section 3, could be different for these loans. As collateral helps in screening borrowers (Bester, 1985; Bester, 1987), there is less asymmetric information. On the basis of the Stiglitz and Weiss (1981) model, the interest rate could therefore be a more useful device to clear the market in this case, as it can be better tailored on the risk of the borrower.

²⁵Running another estimation on loans taken for other purchases different from vehicles, we also find that the impact of net wealth is higher: in 2010-2012 households in the two lowest quartiles of net wealth pay 1.7 p.p. more than households in the highest quartile.

²⁶Using data from Italian Credit Register on the households' status of credit, only one fourth of the loans for which borrowers were delinquent at the end of 2012 improved their status in 2013 and around half worsen it; considering the last group, more than one fourth were in default after one year.

table). We also include dummies for different values of debt-service income ratio, which is an important determinant of households' delinquencies.²⁷

In the first column of Table 7 we report the results of the probit estimation for the whole period (2008-2012). Belonging to the first quartile of net wealth and education are the most significant and economically important determinants of the probability that a household is delinquent on a consumer loan. For households in the lowest quartile of net wealth the probability of being delinquent is 5 percentage point higher than for the richest households, almost doubling the average probability of being delinquent; when the head has a college education this probability is reduced by almost the same percentage (4.8 p.p.) compared with the case of a head who has less than high school education. Some other household characteristics, such as the head being a self-employed, an immigrant, a worker with an uncertain job, are also important, though their impact on the probability is lower (a positive marginal effect of around 3-4 p.p.).

We also find that an incidence of debt-service on income higher than 40 per cent increases the probability of arrears by more than 4 p.p. with respect to households for which the incidence is less than 20 per cent. It is worth noticing that households who search for better financial conditions of the contract are also less likely to be delinquent (1.5 p.p. less): hence searching could also be a signal for lenders about the borrower's determination to pay back the loan. Households who face difficulties to have ends meet are by far more likely to be delinquent: their probability of being in arrears is 6.7 p.p. higher than those who have no difficulties. When in the second column of Table 7 we exclude this variable, the other results are almost unchanged, though the impact of net wealth and education is magnified due to the high correlation (0.3) among these proxies of household economic and financial conditions.

We then repeat the same estimation for the two sub-periods (2008 and 2010-2012, last two columns of the table). The evidence is that in 2008 the probability of arrears is affected almost exclusively by low net wealth, the number of income earners and college education; the last variable predicts perfectly the result of non being in arrears and is therefore excluded from the estimation. These are the same three variables that we find significant in influencing the interest rates on consumer loans after the crisis (Table 2). It seems therefore that, after the crisis, lenders decide their pricing strategy having in mind their credit score model with some lags; this is understandable given that they test their credit score models in periods preceding the one when they have to decide the price. In any case, net wealth and education are among the most important determinants of the probability of delinquency also after the crisis (2010-2012). In this period, other household characteristics become significant in influencing the delinquency

²⁷In the estimations, if a household is delinquent in one survey is then discarded from the following surveys to avoid to count it more than once; the number of these cases is very small.

attitude (self-employed and immigrant); moreover, the effect of searching for better financial conditions is very strong: the associated reduction in the probability of being delinquent is more than 3 p.p..²⁸

After controlling for other household characteristics, the young age of the household head does not matter in influencing the probability of arrears. This is to be kept in mind as we have seen the importance of age for the interest rates and, in the next section, we will uncover the relevance also for credit rationing. Finally, *ceteris paribus*, as for the household residence the evidence is mixed: in 2008, households living in Central regions have worse credit performance (3 p.p.), and this can explain why this feature has become relevant for lenders' pricing strategy in 2010-2012 (Table 2 last column). On the contrary, after the crisis is living in Southern regions that increases the probability of arrears (2 p.p), though the marginal effect is less than one third of the one associated with low net wealth (7.4 p.p.)

Overall, the answer to the question we start with at the beginning of this section is that Italian lenders in deciding the interest rates on consumer loans strictly focus on the household characteristics that matter most in influencing their credit risk in consumer loan market.

6 Lenders' selection in consumer loan market

In order to have a complete view of the consumer loan market in Italy, it is crucial to understand how lenders behave not only in pricing the loans, but also in the selection process of the borrowers. We start by looking at what household characteristics are correlated with the probability to have a consumer loan during the period 2006-2012; we then focus the attention on the demand and supply side of the market for which, unfortunately, we have detailed indications for consumer loans only in the last survey, referring to the year 2012.

The results of the probit estimations to have a consumer loan are reported in the first three columns of Table 8 (for the whole period, 31,847 observations, and in the two sub-periods). First we notice that, as mentioned in Section 4, many household characteristics are relevant; moreover, after the crisis there is a reduction in the frequency of consumer loans: the estimated probability decreases to 10.3 per cent in 2010-2012 from 12.3 per cent in 2006-2008).²⁹ Looking at the whole period, the probability to have a consumer loan is decreasing with the age of the household head: the marginal effects to have such

²⁸Although not reported in the table, the proxy capturing the difficulties to have ends meet significantly influences the probability of delinquencies only in the period after the crisis (2010-2012): this underlines the fact that in this period delinquencies are more strictly correlated with the difficult economic situation the household is facing.

²⁹We do not consider households that use revolving credit card or overdrafts for which we do not have information on the interest rates; statistics referring to the frequency of households with all consumer loans are slightly higher (Magri et al., 2011).

a loan are more than 10 p.p higher for the three age classes than for old households (> 65).³⁰ Interestingly, *ceteris paribus*, consumer loans are more used by households in the lowest quartile of net wealth and facing difficulties to have ends meet (the marginal effect is around 5 p.p.). Households that have more income earners, or with a head married, or more educated are also more likely to have a consumer loan (between 2 and 4 p.p.), while those whose head is an immigrant are much less likely (-5 p.p). The head having an uncertain job strongly reduces the probability to have a consumer loan after the crisis (-3 p.p.), while before the crisis it was the residence in Southern regions that was specifically relevant in decreasing the probability to have a consumer loan (-4 p.p.).³¹

Overall, consumer credit is mainly used by households that are in great need to smooth their consumption as they are facing difficulties to have ends meet with their income, while their better education possibly creates an expectation of an improved income in the future. This evidence is in line with what has been found for other European countries (Magri et al., 2011). After the crisis, it appears that low-wealth households are even more likely to have a consumer loan.³² The background credit risk linked to the household's residence also loses its significance. These are possible signs of an enlargement of the consumer loan market connected with a more widespread use of a risk-based pricing that we have detected in previous sections.

In these estimations we look at the equilibrium results in the market: some variables could hence be important for supply reasons, others for demand reasons. In order to disentangle these effects and have a clearer indication of what matters for lenders in the selection process, in the last two columns of Table 8 we analyse the probability that a household demand a consumer loan and the probability that is turned down by lenders, conditional on demand; this information is available with the detail for consumer loans only in the 2012 SHIW.³³

From the demand equation (column four, 8,151 observations), the most important evidence is that households with difficulties to have ends meet demand consumer loans more frequently (2 p.p. more than households with no difficulties, almost twice as much

³⁰The marginal effects are indeed similar for the first three age classes and lower, around 9 p.p. for households whose head is between 55 and 64.

³¹In all the estimations we also try to include income quartiles, despite the high correlation between income and wealth (almost 0.35 for example for the first quartiles of income and wealth). In the probability model for consumer loans, income alone has a negative effect; this effect is strongly magnified when we also include wealth due to the high correlation. We hence prefer to control for income including the number of income earners and education as a proxy for the expected income. In the demand and supply equation income included alone is never significant.

³²In 2006-2008 the probability that low-wealth households have a consumer loan is 4 p.p. more than the richest households, one third of the average estimated probability; in 2010-2012 the marginal effect for low-wealth households is 5 p.p, one half of the average estimated probability.

³³In previous surveys, we have indications for demand and supply referring to all loans requested by households, including mortgages and loans for business purposes demanded by households with business activity.

as the average probability of demanding a loan). When in an unreported estimation we exclude this proxy, this effect is captured by low-wealth households that are more likely to demand a loan, while the negative coefficients for the households in the second quartile of net wealth disappears.³⁴ Demand of consumer loans is, as expected, much less frequent among old households (head >65).

The supply equation (column five, 158 observations)³⁵, referring to the year 2012, shows that lenders in selecting applications pay great attention to the household economic and financial conditions that are also important in determining their credit risk (Table 7). When the head is better educated, the rationing is less likely: the marginal effect is -13 p.p. for households whose heads have a high school diploma compared with households with a head who did not complete the high school (the estimated probability of rationing is pretty high after the crisis, equal to 35 per cent).³⁶ Similarly, we find evidence that one more income earner reduces the probability of rationing by more than 10 p.p.. It is also true that lenders prefer to grant credit to households in the second quartile of net wealth: their rationing rate is 22 p.p. lower than for the richest households and the coefficient is statistically different from the one referring to low-wealth households as well.

We are not able to evaluate the change in the importance of these variables with respect to the period 2006-2008, though we have seen that consumer loans are more widespread among low-wealth households during 2010-2012. We could hence infer that household wealth has become less important in the selection process, while it has acquired relevance for the pricing strategy. This is consistent with a framework where lenders know better the credit risk of their applicants, through a larger use of credit scoring models, are accepting slightly riskier borrowers, but use the information about the borrower's credit risk also to apply a more tailored price of the loan.

It is nonetheless true that there are still some household features that are strongly important in the selection of borrowers while their power in explaining loans' delinquencies is very small or nil. *Ceteris paribus*, households whose head has an uncertain job are much more frequently turned down by lenders (29 p.p.), though their probability of being delinquent is only marginally significantly higher than for the other categories of workers on the whole period of the analysis and this effect vanishes in the two sub-periods (Table 7). This is even more noticeable for young households (head <35): their probability of being rejected by a lender is almost 30 p.p. higher than for old households, though, *ceteris paribus*, they are never more delinquent.³⁷

³⁴The correlation between the dummy capturing difficulties to have ends meet and the first quartile of net wealth is more than 0.2.

³⁵We consider only those households that have asked for a consumer loan.

³⁶The college education dummy is dropped as it predicts perfectly that the household is not rationed.

³⁷Another similar evidence concerns sex: male heads are much less likely to be turned down (-12 p.p.)

7 Discussion and conclusions

In a recent paper Zinman reviews theories and empirical evidence on inefficient consumer credit supply (Zinman, 2013). He argues that many policy questions regarding consumer credit begin with a presumption about whether, and to what extent, markets fail to supply an efficient quantity of credit. Theories abound for both over- and under-supply. He concludes his survey by saying that there is indeed a lack of convincing evidence on whether consumer credit markets err, and in which directions, much less why.

We could add that even less has been discovered or even studied about the pricing of consumer loans, specifically loans different from mortgages. And the price of the loan is crucial for evaluating the supply of loans as well. When this price is far apart from the intrinsic credit risk of the borrower, many potential borrowers can be induced to shun consumer credit market when they need to smooth consumption or improve their social mobility, for example by obtaining loans to increase their education.³⁸ This paper brings some evidence on this topic in a country like Italy where interest rates on new consumer loans have been on average much higher than in other euro area countries.

The consumer loan market in Italy is certainly changing, specifically after the 2008 financial crisis. In this paper we have uncovered that in the period 2010-2012 the pricing of consumer loans is correlated mainly with household economic and financial conditions, primarily net wealth, but also the number of income earners and the education of the household head, proxy of his future income. Before the crisis (2006-2008) interest rates were based more on the household residence, a sort of background risk explained mainly by the wider incidence of bad loans and the higher enforcement costs in Southern regions; these correlations disappear after the 2008 crisis. Or they were correlated to the uncertain job of the household head, without a more specific attention to household economic and financial conditions.

Lenders have therefore paid much more attention to the specific credit risk of the borrower after the 2008 crisis. We uncover that net wealth, education and the number of income earners are actually the most important factors in determining the delinquent attitude of the borrowers in consumer loan market. In 2010-2012 low-wealth households are, *ceteris paribus*, more likely to be in arrears by a factor that is more than three times as high as the one referring to households living in Southern regions.³⁹ Overall, it seems like, after the crisis, the consumer loan market in Italy is a world different

than female heads, while sex is not a determinant of the probability to be delinquent after controlling for household economic and financial conditions.

³⁸These are also borrowers that care about the interest rates to pay: they are hence determined to pay the loan back and do not think about strategic default.

³⁹in 2010-2012 the probability of being delinquent increases by 7.4 p.p. for low-wealth households and by 2.3 p.p. for households located in Southern regions; the average probability of being delinquent in the period is 6.2 per cent.

from the one drawn in Stiglitz and Weiss (1981): banks are more willing to evaluate the specific borrower's credit risk, even for these loans of small amount, and more able to discriminate among customers in deciding prices as well. This has also consequences for access to the credit market.

In the final part of the paper we hence look at the lenders' selection process and the probability to have a consumer loan. After the crisis, low-wealth households are relatively more likely to have a consumer loan and those living in Southern regions are no longer less likely, consistently with a more widespread use of risk based pricing and less rationing on the perceived riskiest borrowers. We also find that the lenders' selection process is connected with the same household characteristics that are important in determining borrowers' credit risk and that matter in deciding the prices of loans (wealth, education, income earners). However, there is evidence that some credit rationing in the consumer loan market is difficult to explain.

Young households (head < 35) seem peculiarly badly evaluated. Their applications are much more likely to be turned down by lenders, while when they get credit they pay lower interest rates. This happens in a framework where credit scoring models signal that the young age of the household head is not significant in explaining the delinquent attitude, at least for consumer loans and after controlling for other household characteristics. The indication lenders should get from credit scoring models is hence that potential borrowers should not be evaluated in the access to consumer loan market on the basis of the age of the household head. Lenders should, on the contrary, keep focusing their attention on the household economic and financial conditions that are so crucial in influencing loans' default. Granting loans to young households at a correct price is particularly important as they are at the initial stage of their life cycle, when credit plays a crucial role in supporting consumption and in sustaining social mobility.

A final result of this paper is that households can also do more to get better prices and hence more credit. We have uncovered that households searching for better financial conditions get interest rates that are 0.4 p.p. lower than those paid by non searching households. When considering the average amount of consumer loans (8,576 euro at current prices), the average maturity (around 5 years), and the average interest rate (6.3 per cent) over the period under analysis, this implies a saving of around 100 euro (6.6 per cent of total interest rates paid in the worst case). Better products are hence available to customers who need to search for them. All in all, more efficient credit markets could arise from different attitudes on both sides of the market.

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Appendix

Detailed description of the variables used in the estimation

Interest rates: Interest rates reported by households in the Survey. Source: SHIW.

Age classes: Dummy equal 1 when the age of the head of the household is in the class; residual class age ≥ 65 . Source: SHIW.

Net wealth quartiles: Dummy equal 1 when the household net wealth is in the quartile; residual class is 4 quartile. Belonging to the net wealth quartiles are measured in each survey. Source: SHIW.

Married: Dummy equal 1 when the head of the household is married. Source: SHIW.

Self-employed: Dummy equal 1 when the head of the household is self-employed. Source: SHIW.

No. income earners: Number of people earning an income inside the households. Source: SHIW.

Immigrant: Dummy equal 1 when the head of the household is an immigrant from a country outside the European Union. Source: SHIW.

Uncertain job: Dummy equal 1 when the head of the household is an employee who has a fixed-term contracts or a self-employed who has non-standard contracts such as occasional collaborations, works on a single project. Source: SHIW.

High school or college: Dummy equal 1 when the head of the household has completed the high school or is graduate; residual category is made of households whose head has less than high school education. Source: SHIW.

Large municipality: Dummy equal 1 when the household lives in a municipality with more than 500,000 inhabitants. Source: SHIW.

Man: Dummy equal 1 when the household head is a man. Source: SHIW.

Loan amount: The household's residual amount of consumer loans, expressed in 000 of euro and at 1995 prices. Source: SHIW.

Search: Dummy equal 1 when the household searches for better financial term of the contract in choosing the lender who granted the loan. Source: SHIW.

High debt-income: Dummy equal 1 when the household is in the highest quartile of the total debt-income distribution among the households with consumer loans and for each survey. Source: SHIW.

Center or South: Dummy equal 1 when the household is resident in Central or Southern regions; residual class are households resident in Northern regions. Source: SHIW.

Hs difficulties: Dummy equal 1 when the household has from many to some difficulties to make ends meet. Source: SHIW.

Initial loan amount: The original amount of consumer loans, expressed in 000 of euro. This variable is available since the 2010 Survey and cannot be expressed at the price of a reference year as we do not know in what year the loan was granted. Source: SHIW.

Original loan maturity: The original maturity of consumer loans, expressed in months. This variable is available since the 2010 Survey. Source: SHIW.

Quantity recovered: Time, expressed in months, to recover a loan after borrowers' default. Only mortgage proceedings for insolvency are considered; data are measured at regional level. Source: Bank of Italy, questionnaire to a representative sample of banks referring to the years 1992-3.

Time for recovery: The share of the loan that is recovered at the end of mortgage proceedings for insolvency; data are measured at regional level. Source: Bank of Italy, questionnaire to a representative sample of banks referring to the years 1992-3.

Incidence of bad loans: The share of bad on total household loans, measured at provincial level and for the period of the analysis. Source: Bank of Italy, supervisory reports.

Length of civil trials: The length of civil trials in Italy in the period 1995-1998; data are at provincial level and expressed in years. Source: Ministry of Justice.

Herfindahl: The index is the of the squares of the shares of each bank, measured with the number of branches at provincial level. The index varies between 0 (perfect competition) and 1 (monopoly). The index is measured for the period under analysis. Source: Bank of Italy, supervisory reports.

Being in arrears: Frequency of being delinquent for more than 90 days on consumer loans; data are available since the 2008 SHIW and refer only to households with a consumer loan. Source: SHIW.

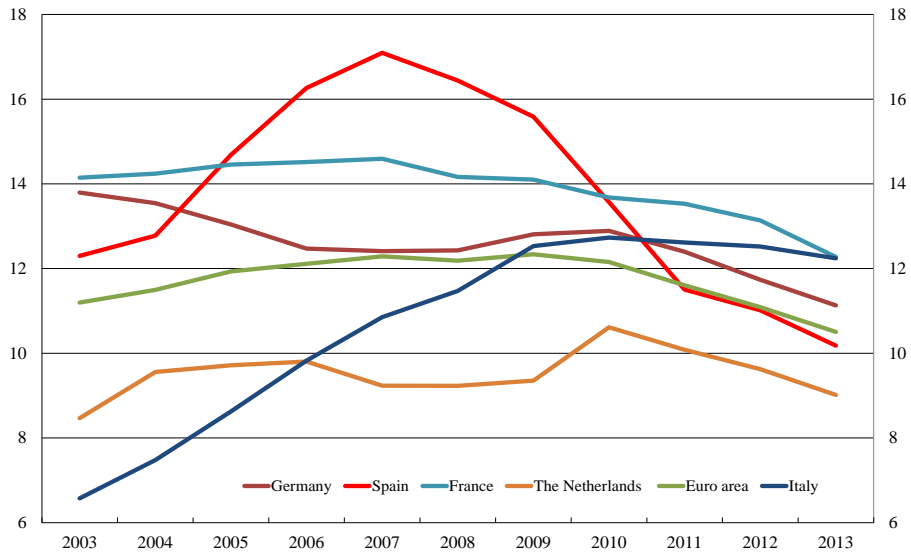
Have a consumer loan: Frequency of households with a consumer loans; revolving credit cards and overdrafts are excluded because they are not considered when households are asked about interest rates. Source: SHIW.

Ask for a consumer loan: Frequency of households who ask for a consumer loans; available only for the 2012 Survey. Source: SHIW.

Turned down (among those who ask): Frequency of households asking for a loan who have been turned down by lenders, totally or partially; available only for the 2012 Survey. Source: SHIW.

Tables and figures

Figure 1: Consumer loans as a percentage of households' consumption



Source: supervisory reports and Eurostat

Figure 2: Comparison between interest rates in SHIW and in the supervisory reports

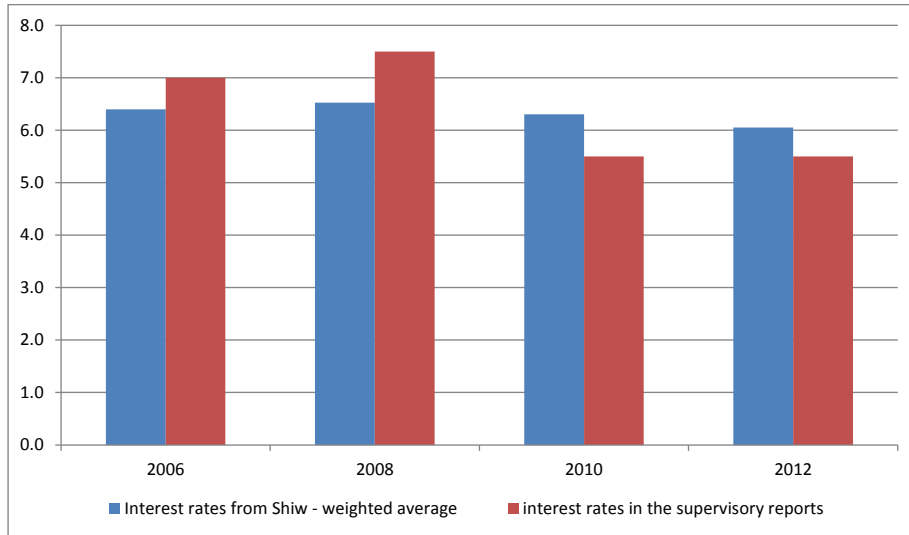


Table 1: Descriptive statistics of the variables used in estimations
(over the period 2006-2012)

Variables	mean	median	std. dev	no. obs.	coef. variation
<i>Statistics on interest rates</i>					
2006	6.4	6.5	3.5	815	54.3
2008	6.5	6.1	2.4	434	36.9
2010	6.3	6.1	2.4	226	37.7
2012	6.1	5.8	3.0	637	48.8
Variables	mean	median	std. dev	25 pct	75 pct
<i>Continuous variables</i>					
Interest rate	6.3	6.1	3.0	4.5	7.9
No. income earners	1.8	0.8	2	1	2
Loan amount (000 euro, 1995 prices)	6.3	4.1	12.3	1.7	8.1
Initial loan amount (000 euro)	13.3	10.0	13.2	5.4	16
Original loan maturity (months)	57.3	56.0	20.4	44	67
Quantity recovered (per cent of loan)	63.8	60.3	7.7	60.0	70.1
Time for recovery (months)	62.7	60.0	13.3	55.8	65.6
Incidence of bad loans (per cent)	3.8	3.3	2.1	2.1	5.2
Length of civil trials (years)	3.4	3.2	0.7	3.0	3.6
Herfindahl	0.11	0.10	0.05	0.08	0.12
<i>Dummy variables</i>					
Age <35	15.7				
Age 35-44	31.8				
Age 45-54	26.0				
Age 55-64	16.7				
Net wealth 1q	33.0				
Net wealth 2q	26.0				
Net wealth 3q	22.6				
Married	70.8				
Self-employed	17.9				
Immigrant	5.6				
Uncertain job	7.2				
High school	36.5				
College	11.4				
Large municipality	13.5				
Man	76.8				
Search	42.8				
High debt-income	24.0				
Center	21.3				
South	26.4				
Hs difficulties	72.2				
<i>Dependent variables in the other estimations</i>					
Being in arrears	6.1				
Have a consumer loan	12.0				
Ask for a consumer loan	1.9				
Turned down (among those who ask)	38.5				

Statistics are weighted with sample weights and refer to the sample for which estimations have been run. Households declaring zero interest rates are excluded from the analysis. The average value of net wealth, expressed at 1995 prices, is 1,278 in the first quartile of net wealth, 87,451 in the second quartile, 189,819 in the third quartile, and 593,847 in the fourth quartile.

Table 2: The impact of borrowers' risk on consumer loans interest rates
(OLS estimations)

Variables	A baseline		B with hs controls		B 2006-08		B 2010-12	
Age <35	-0.334 (0.291)		-0.463 (0.302)		-0.249 (0.406)		-0.847 (0.392)	**
Age 35-44	-0.405 (0.254)		-0.444 (0.249)		-0.347 (0.353)		-0.615 (0.310)	*
Age 45-54	-0.450 (0.279)		-0.472 (0.277)		-0.413 (0.365)		-0.611 (0.374)	
Age 55-64	-0.387 (0.272)		-0.389 (0.268)		-0.305 (0.376)		-0.490 (0.318)	
Net wealth 1q	0.852 (0.186)	***	0.817 (0.218)	***	0.493 (0.347)		1.201 (0.303)	***
Net wealth 2q	0.558 (0.183)	***	0.567 (0.208)	***	0.493 (0.321)		0.755 (0.265)	***
Net wealth 3q	0.325 (0.182)	*	0.330 (0.194)	*	0.424 (0.297)		0.270 (0.225)	
Married			-0.224 (0.198)		-0.583 (0.261)	**	0.269 (0.214)	
Self-employed			0.170 (0.199)		0.177 (0.234)		0.087 (0.274)	
No. income earners			-0.008 (0.091)		0.101 (0.131)		-0.203 (0.116)	*
Immigrant			0.022 (0.278)		-0.375 (0.399)		0.565 (0.396)	
Uncertain job			0.582 (0.254)	**	0.812 (0.426)	*	0.231 (0.334)	
High school			0.010 (0.137)		0.049 (0.208)		-0.031 (0.194)	
College			-0.295 (0.167)	*	-0.100 (0.283)		-0.448 (0.257)	*
Large municipality			0.246 (0.417)	*	0.845 (0.458)	*	-0.468 (0.378)	
Man			0.209 (0.154)		0.352 (0.182)	*	0.003 (0.257)	
Constant	5.969 (0.308)	***	5.950 (0.390)	***	5.663 (0.561)	***	5.904 (0.471)	***
Center (memo)	0.073 (0.215)		0.107 (0.196)		-0.317 (0.229)		0.776 (0.236)	***
South (memo)	0.650 (0.308)	**	0.652 (0.264)	**	0.944 (0.423)	**	0.408 (0.307)	
No. observations	2112		2112		1249		863	
R ²	0.044		0.048		0.068		0.112	
Period	2006-2012		2006-2012		2006-2008		2010-2012	

Region and year dummies are included in all estimations. Coefficients of area dummies are reported, as memo accounts, from other estimations as they are easier to read. Robust standard errors, adjusted for 95 clusters in provinces, are in brackets. * significant at 10%, ** at 5% and *** at 1%. Households declaring zero interest rates are excluded. For the definition of the other variables see the Appendix.

Table 3: The impact of borrowers' risk on consumer loans interest rates
(OLS estimations)

Variables	C bank variables		C 2006-08		C 2010-12		C 2010-12	
Age <35	-0.449 (0.303)		-0.220 (0.415)		-0.864 (0.415)	**	-0.835 (0.414)	**
Age 35-44	-0.422 (0.250)	*	-0.305 (0.360)		-0.613 (0.340)	**	-0.601 (0.335)	*
Age 45-54	-0.362 (0.281)		-0.472 (0.381)		-0.629 (0.384)		-0.628 (0.386)	
Age 55-64	-0.381 (0.269)		-0.289 (0.377)		-0.482 (0.317)		-0.483 (0.322)	
Net wealth 1q	0.775 (0.218)	***	0.449 (0.344)		1.158 (0.305)	***	1.177 (0.303)	***
Net wealth 2q	0.518 (0.206)	**	0.424 (0.325)		0.714 (0.263)	***	0.729 (0.258)	***
Net wealth 3q	0.302 (0.196)	*	0.393 (0.299)		0.240 (0.222)		0.254 (0.219)	
Married	-0.212 (0.196)		-0.547 (0.258)	**	0.233 (0.218)		0.220 (0.213)	
Self-employed	0.184 (0.201)		0.208 (0.238)		0.095 (0.272)		0.088 (0.278)	
No. income earners	0.013 (0.088)		0.127 (0.130)		-0.184 (0.111)	*	-0.201 (0.109)	*
Immigrant	-0.050 (0.282)		-0.432 (0.399)		0.478 (0.378)		0.494 (0.389)	
Uncertain job	0.545 (0.262)	**	0.751 (0.440)	*	0.228 (0.340)		0.230 (0.338)	
High school	0.029 (0.135)		0.077 (0.203)		-0.030 (0.193)		-0.037 (0.193)	
College	-0.263 (0.167)		-0.050 (0.285)		-0.447 (0.256)	*	-0.458 (0.258)	*
Large municipality	0.224 (0.410)	*	0.834 (0.440)	*	-0.513 (0.374)		-0.520 (0.375)	
Man	0.228 (0.154)		0.376 (0.183)	**	0.016 (0.255)		0.013 (0.254)	
Loan amount	-0.006 (0.005)		-0.010 (0.004)	**	-0.002 (0.012)			
Search	-0.438 (0.157)	***	-0.435 (0.188)	**	-0.423 (0.202)	**	-0.419 (0.205)	**
High debt-income	0.053 (0.160)		0.084 (0.212)		0.047 (0.286)		0.035 (0.282)	
Initial loan amount							1.548 (6.068)	
Original loan maturity							0.003 (0.005)	
Constant	6.097 (0.418)	***	5.762 (0.570)	***	5.663 (0.561)	***	5.936 (0.584)	***
No. observations	2112		1249		863		863	
R ²	0.054		0.075		0.117		0.118	
Period	2006-2012		2006-2008		2010-2012		2010-2012	

Specifications including variables connected with the bank relationship. Regional and year dummies are included in all estimations. Robust standard errors, adjusted for 95 clusters in provinces, are in brackets. * significant at 10%, ** at 5% and *** at 1%. See other footnotes at Table 2.

Table 4: The impact of borrowers' risk on consumer loans interest rates
(Heckman estimations)

Variables	interest rate		selection marginal effects		interest rate		interest rate	
Age <35	-0.364 (0.374)		0.113 (0.010)	***	0.086 (3.550)		-0.911 (0.481)	*
Age 35-44	-0.399 (0.322)		0.114 (0.009)	***	-0.034 (3.437)		-0.755 (0.446)	*
Age 45-54	-0.468 (0.344)		0.102 (0.008)	***	-0.139 (3.004)		-0.791 (0.482)	
Age 55-64	-0.416 (0.307)		0.077 (0.008)	***	0.134 (2.505)		-0.581 (0.367)	
Net wealth	-0.000 (0.000)		-0.000 (0.000)	***	-0.000 (0.001)		-0.002 (0.000)	***
Net wealth sq	0.000 (0.000)	*	0.000 (0.000)	***	0.000 (0.000)		0.000 (0.000)	***
Married	-0.213 (0.200)		0.032 (0.005)	***	-0.478 (0.846)		0.222 (0.224)	
Self-employed	0.117 (0.197)		-0.005 (0.007)		0.138 (0.212)		0.167 (0.268)	
No. income earners	-0.005 (0.090)		0.025 (0.003)	***	0.162 (0.620)		-0.226 (0.123)	*
Immigrant	0.105 (0.284)		-0.039 (0.012)	***	-0.430 (0.894)		0.709 (0.377)	*
Uncertain job	0.587 (0.265)	**	-0.015 (0.010)		0.763 (0.460)	*	0.288 (0.338)	
High school	-0.059 (0.133)		0.016 (0.006)	***	0.018 (0.265)		-0.070 (0.192)	
College	-0.373 (0.164)	**	0.017 (0.007)	***	-0.152 (0.281)		-0.474 (0.245)	*
Large municipality	0.217 (0.394)		-0.004 (0.010)		0.793 (0.473)	*	-0.522 (0.321)	
Man	0.210 (0.159)		0.022 (0.005)	**	0.401 (0.414)		-0.025 (0.248)	
Loan amount	-0.007 (0.005)				-0.010 (0.004)	***	0.004 (0.012)	
Search	-0.458 (0.157)	***			-0.443 (0.194)	**	-0.435 (0.204)	**
High debt-income	0.041 (0.157)				0.114 (0.276)		0.003 (0.262)	
Hs difficulties			0.045 (0.005)	***				
Constant	6.961 (0.888)	***			5.399 (12.751)		7.916 (1.108)	***
No. observations	31,553		31,553		15,606		15,947	
No. uncensored obs.	2112		2112		1249		863	
Wald test (pvalue)	0.610				0.957		0.182	
Estimated prob.			0.101					
Period	2006-2012		2006-2012		2006-2008		2010-2012	

Specifications including variables connected with the bank relationship. Regional and year dummies are included in all estimations. Robust standard errors, adjusted for 95 clusters in provinces, are in brackets. * significant at 10%, ** at 5% and *** at 1%. The Wald test tests the null hypothesis that the two equations, interest rate and selection, are independent. See other footnotes at Table 2

Table 5: The impact of geographical variables on consumer loans interest rates
(OLS estimations)

Variables	C	C	C
	2006-12	2006-08	2010-12
Quantity recovered (region)	0.013 (0.019)	0.032 (0.026)	-0.018 (0.020)
Time for recovery (region)	0.008 (0.006)	0.017 (0.010)	* -0.004 (0.008)
Herfindahl (province)	1.356 (1.662)	1.111 (2.894)	2.245 (3.597)
No. observations	2112	1249	863
R ²	0.034	0.045	0.066
Period	2006-2012	2006-2008	2010-2012
Incidence of bad loans (province)	8.853 (7.508)	17.128 (10.274)	* -0.660 (8.658)
Herfindahl (province)	1.500 (1.565)	0.947 (3.104)	2.017 (3.782)
No. observations	2112	1249	863
R ²	0.034	0.039	0.0634
Period	2006-2012	2006-2008	2010-2012
Lenght of civil trials (province)	0.171 (0.167)	0.392 (0.208)	* -0.087 (0.198)
Herfindahl (province)	1.415 (1.590)	0.947 (3.104)	2.184 (3.687)
No. observations	2112	1249	863
R ²	0.033	0.039	0.0634
Period	2006-2012	2006-2008	2010-2012

Specifications including variables connected with the bank relationship. Year dummies are included in all estimations; area and regional dummies need to be excluded due to high collinearity with the other geographical indicators analyzed in the table. Robust standard errors, adjusted for 95 clusters in provinces, are in brackets. * significant at 10%, ** at 5% and *** at 1%. See other footnotes at Table 2

Table 6: The impact of borrowers' risk on consumer loans interest rates: robustness
(OLS estimation)

Variables	winsorization 2006-2008	windsorization 2010-2012		lags 2006-2008		lags 2010-12	
Age <35	-0.185 (0.366)	-0.712 (0.348)	**	-0.056 (0.486)		-1.373 (0.611)	**
Age 35-44	-0.226 (0.309)	-0.494 (0.288)	*	0.170 (0.485)		-0.920 (0.450)	**
Age 45-54	-0.284 (0.330)	-0.542 (0.323)	*	0.306 (0.413)		-1.179 (0.454)	**
Age 55-64	-0.234 (0.327)	-0.439 (0.274)		0.053 (0.490)		-1.239 (0.398)	***
Net wealth 1q	0.463 (0.333)	1.073 (0.292)	***	0.327 (0.356)		1.045 (0.450)	**
Net wealth 2q	0.477 (0.303)	0.661 (0.264)	**	0.603 (0.332)	*	0.757 (0.447)	*
Net wealth 3q	0.389 (0.282)	0.199 (0.208)		0.442 (0.342)		0.707 (0.378)	*
Married	-0.508 (0.246)	** 0.303 (0.208)		-0.271 (0.285)		-0.268 (0.415)	
Self-employed	0.205 (0.235)	0.082 (0.266)		-0.606 (0.359)		0.403 (0.551)	
No. income earners	0.130 (0.125)	-0.165 (0.108)		-0.157 (0.173)		0.122 (0.139)	
Immigrant	-0.484 (0.375)	0.499 (0.375)		-0.964 (0.622)		1.038 (0.609)	*
Uncertain job	0.706 (0.407)	* 0.253 (0.359)		1.597 (0.495)	***	-0.115 (0.395)	
High school	0.094 (0.192)	0.002 (0.189)		0.002 (0.265)		-0.125 (0.255)	
College	-0.016 (0.279)	-0.430 (0.251)	*	0.010 (0.307)		-0.306 (0.355)	
Large municipality	0.863 (0.410)	** -0.507 (0.367)		0.398 (0.742)		-0.715 (0.394)	*
Man	0.345 (0.172)	** 0.027 (0.227)		-0.214 (0.273)		-0.059 (0.280)	
Loan amount	-0.009 (0.004)	** 0.003 (0.011)		0.034 (0.027)		-0.027 (0.027)	
Search	-0.476 (0.165)	*** -0.391 (0.193)	**	-0.399 (0.227)	*	-0.436 (0.255)	*
High debt-income	0.100 (0.204)	0.014 (0.270)		-0.408 (0.639)		0.180 (0.445)	
Center (memo)	-0.335 (0.209)	0.680 (0.233)	***	-0.688 (0.229)	***	0.960 (0.215)	
South (memo)	0.831 (0.431)	* 0.361 (0.284)		1.378 (0.365)	***	0.582 (0.376)	
Constant	5.683 (0.532)	*** 5.961 (0.477)	***	6.072 (0.637)	***	6.320 (0.725)	***
No. observations	1249	863		648		499	
R ²	0.082	0.114		0.136		0.138	
Period	2006-2008	2010-2012		2006-2008		2010-2012	

Specifications including variables connected with the bank relationship. In columns 1 and 2 interest rates are winsorized at 1st and 99th percentile; in columns 3 and 4 we include 2-year lags of the regressors. Region and year dummies are included in all estimations. Coefficients of area dummies are reported, as memo accounts, from other estimations as they are easier to read. Robust standard errors, adjusted for 95 clusters in provinces, are in brackets. * significant at 10%, ** at 5% and *** at 1%. See other footnotes at Table 2.

Table 7: The probability of delinquency on consumer loans

(Probit estimation - marginal effects)

Variables	2008-2012	2008-2012	2008	2010-12
Age <35	-0.001 (0.019)	-0.007 (0.019)	-0.006 (0.027)	-0.003 (0.024)
Age 35-44	-0.007 (0.012)	-0.008 (0.012)	-0.016 (0.017)	0.000 (0.018)
Age 45-54	-0.006 (0.013)	-0.007 (0.014)	-0.040 (0.020)	** 0.008 (0.017)
Age 55-64	-0.023 (0.014)	* -0.022 (0.014)	-0.011 (0.017)	-0.032 (0.024)
Net wealth 1q	0.049 (0.017)	*** 0.064 (0.017)	*** 0.055 (0.023)	*** 0.074 (0.018)
Net wealth 2q	0.013 (0.018)	0.024 (0.017)	0.016 (0.026)	0.031 (0.019)
Net wealth 3q	0.017 (0.020)	0.022 (0.019)	0.021 (0.027)	0.020 (0.024)
Married	0.000 (0.012)	-0.002 (0.012)	-0.006 (0.015)	0.001 (0.016)
Self-employed	0.034 (0.013)	** 0.032 (0.013)	** 0.029 (0.020)	0.041 (0.018)
No. income earners	-0.005 (0.005)	-0.007 (0.006)	-0.019 (0.009)	** -0.001 (0.008)
Immigrant	0.037 (0.015)	** 0.039 (0.015)	** 0.023 (0.021)	0.053 (0.021)
Uncertain job	0.026 (0.015)	* 0.028 (0.015)	* 0.029 (0.024)	0.028 (0.020)
High school	-0.025 (0.009)	*** -0.029 (0.009)	*** -0.020 (0.014)	*** -0.037 (0.014)
College	-0.048 (0.021)	** -0.061 (0.021)	***	-0.053 (0.025)
Large municipality	0.010 (0.018)	0.008 (0.017)	0.019 (0.027)	0.006 (0.011)
Man	-0.004 (0.011)	-0.007 (0.011)	-0.009 (0.014)	-0.007 (0.014)
Loan amount	0.001 (0.001)	0.001 (0.001)	0.002 (0.002)	0.001 (0.001)
Search	-0.015 (0.009)	* -0.017 (0.009)	* -0.011 (0.014)	-0.033 (0.010)
High debt-income	0.004 (0.012)	0.004 (0.013)	-0.062 (0.029)	** 0.026 (0.016)
Sevdeb 20-30	0.015 (0.011)	0.016 (0.012)	-0.024 (0.024)	0.028 (0.016)
Sevdeb 30-40	0.019 (0.018)	0.024 (0.019)	-0.002 (0.046)	0.035 (0.022)
Sevdeb >=40	0.043 (0.020)	** 0.048 (0.019)	** 0.076 (0.039)	** 0.047 (0.023)
Center	0.010 (0.012)	0.013 (0.012)	0.032 (0.019)	* 0.004 (0.016)
South	0.009 (0.013)	-0.014 (0.013)	0.004 (0.021)	0.023 (0.015)
Hs difficulties	0.067 (0.019)	***		
No. observations	2708	2708	943	1656
R ²	0.136	0.117	0.130	0.147
Predicted probability	0.053	0.053	0.043	0.062
Period	2008-2012	2008-2012	2008	2010-2012

Area and year dummies are included in all estimations. Robust standard errors, adjusted for 95 clusters in provinces, are in brackets. * significant at 10%, ** at 5% and *** at 1%. In the second column and the following we drop the information concerning difficulties to have ends meet, which is private information of the household, not available to banks. In the other cases, when the coefficient is not reported this is due to the drop of the variable that predicts results perfectly.

Table 8: The probability of having, demanding and be rationed on consumer loans
(Probit estimation - marginal effects)

Variables	loan		loan		loan		demand		rationing	
Age <35	0.129	***	0.145	***	0.111	***	0.023	***	0.290	**
	(0.009)		(0.012)		(0.010)		(0.008)		(0.129)	
Age 35-44	0.126	***	0.137	***	0.115	***	0.016	***	-0.029	
	(0.008)		(0.010)		(0.010)		(0.005)		(0.091)	
Age 45-54	0.120	***	0.125	***	0.115	***	0.023	***	0.138	
	(0.007)		(0.010)		(0.008)		(0.005)		(0.098)	
Age 55-64	0.089	***	0.103	***	0.075	***	0.022	***	0.029	
	(0.006)		(0.010)		(0.008)		(0.004)		(0.095)	
Net wealth 1q	0.047	***	0.043	***	0.052	***	0.006		-0.065	
	(0.007)		(0.009)		(0.008)		(0.004)		(0.089)	
Net wealth 2q	0.015	**	0.008		0.020	**	-0.011	**	-0.217	*
	(0.006)		(0.008)		(0.008)		(0.005)		(0.123)	
Net wealth 3q	0.001		-0.008		0.009		-0.003		-0.155	
	(0.005)		(0.007)		(0.007)		(0.004)		(0.100)	
Married	0.039	***	0.045	***	0.032	***	0.006		-0.086	
	(0.004)		(0.006)		(0.006)		(0.004)		(0.069)	
Self-employed	-0.006		0.007		-0.020	**	-0.013	**	-0.084	
	(0.007)		(0.009)		(0.009)		(0.007)		(0.114)	
No. income earners	0.029	***	0.030	***	0.028	***	0.002		-0.110	**
	(0.003)		(0.004)		(0.004)		(0.002)		(0.050)	
Immigrant	-0.052	***	-0.054	***	-0.050	***	-0.000		0.170	
	(0.012)		(0.013)		(0.014)		(0.008)		(0.115)	
Uncertain job	-0.025	***	-0.012		-0.034	***	0.001		0.289	***
	(0.009)		(0.013)		(0.012)		(0.008)		(0.110)	
High school	0.015	**	0.017	**	0.012		-0.000		-0.131	*
	(0.006)		(0.007)		(0.008)		(0.000)		(0.074)	
College	0.012	*	0.014	**	-0.009		-0.004			
	(0.007)		(0.008)		(0.010)		(0.006)			
Large municipality	-0.001		-0.001		0.000		-0.074		0.006	
	(0.012)		(0.010)		(0.018)		(0.008)		(0.184)	
Man	0.018	***	0.016	**	0.019	***	-0.005		-0.119	*
	(0.005)		(0.006)		(0.006)		(0.005)		(0.067)	
Hs difficulties	0.050	***	0.057	***	0.042	***	0.021	***		
	(0.005)		(0.008)		(0.006)		(0.005)			
Center (memo)	0.017		-0.004		0.036		0.010	**	-0.145	
	(0.014)		(0.016)		(0.014)		(0.004)		(0.129)	
South (memo)	-0.025	*	-0.042	***	-0.007		0.008		0.199	**
	(0.013)		(0.015)		(0.014)		(0.005)		(0.092)	
No. observations	31,847		15,745		16,102		8,151		158	
Pseudo R ²	0.099		0.100		0.106		0.070		0.312	
Estimated prob.	0.113		0.123		0.103		0.021		0.354	
Period	2006-2012		2006-2008		2010-2012		2012		2012	

Regional (area dummies for the last two columns) and year dummies are included in all estimations. Robust standard errors, adjusted for 95 clusters in provinces, are in brackets. * significant at 10%, ** at 5% and *** at 1%. The number of observations is slightly larger than those in Table 4 because in that case the selection equation was on those households with consumer loans and declaring an interest rates. The variable hs difficulties is excluded from rationing equation as is a private information of the household. In the other cases, when the coefficient is not reported this is due to the drop of the variable that predicts results perfectly. For the first three estimations we report the coefficients of area dummies from another estimation as memo items.