

Italian Consumer Loan Market: Are Lenders Using Risk-Based Pricing? *

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Abstract

The aim of this paper is to verify whether in Italy the prices of consumer loans, such as the loans to purchase a motor vehicle, furniture or for other not specified purposes, are based on the *specific* risk of the borrower. By using data on the price of consumer loans, available in the 2006 Survey of Household Income and Wealth of Italian households, the evidence is that the price charged by Italian lenders is barely influenced by the traditional proxies of the specific risk of the borrower, such as income, net wealth, type of occupation, education, employment status, being a single parent or facing difficulties with the disposable income. It seems that most of these variables are important in determining whether or not a household has a consumer loan, but not its price. On the contrary, the most important factor influencing the price charged by lenders to consumer loans is the area where the household lives, with borrowers in Southern regions who pay, *ceteris paribus*, interest rates that are 1 point higher compared to households living in the North of the country. Overall, there appears to exist different prices for few categories of products, primarily differentiated according to the residence of the borrower (a sort of *background* risk), the borrower being married or not (a proxy of the household income variability) and the borrower having also a mortgage (a sort of information effect).

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1 Introduction

Risk-based pricing is the practice of lenders who charge each borrower a specific interest rate based on a measure of his credit risk, rather than charging one single rate and refusing to grant loans to the highest-risk borrowers. The theoretical and empirical literature has primarily focused on the last feature of the rationing in credit market. However, a few recent papers have also analyzed the risk content of the prices for consumer loans set by lenders, though this literature is scant and confined to the United States. Even in the United States, where the households' debt market is much more developed than in Italy, 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. Recent evidence for the US is that easily collateralized household loans, such as mortgages, are those that have been most affected by these changes in pricing techniques (Edelberg, 2006).

In Italy the market for consumer loans, such as loans for motor vehicles, loans for house equipments and loans for other purposes, excluding mortgages, is still in its infancy both if compared to the United States and to Europe. Consumer credit was less than 5 per cent of GDP in Italy, versus shares that were around 7-8 per cent in Spain and France and 10 per cent in Germany.¹ According to surveys, the percentage of households with consumer credit is around 13 per cent in Italy (2006), versus 20 per cent in Spain (2001), 30 per cent in France (2004) and more than 50 per cent in the United States (2004).²

However, in Italy this market has been growing at a rapid pace during this decade. Following a widespread decline in interest rates in the eve of the European Monetary Union, the price of consumer loans also decreased fast; however, in recent years it stayed roughly 1 percentage point above the corresponding rate in the euro-area. Nonetheless, this spread could reflect higher specific risk of Italian borrowers. It is therefore of interest to verify whether and to what extent the Italian lenders decide the price of consumer loans using a risk-based strategy. This is the question this paper wants to address.

The interest rates charged by lenders to consumer loans were asked for the first time in the 2006 wave of the Survey of Households' Income and Wealth (SHIW). Following Edelberg (2006), I

¹These data are collected by the European Credit Research Institute and refer to 2004.

²These data are taken from OECD, Economic Outlook, N. 80, 2006, *Has the Rise in Debt Made Households More Vulnerable?*

model this interest rate as a function of different household characteristics that can be considered as proxies of the specific household risk, essentially the risk of being late in payment and ultimately the risk of default. Unfortunately, in the SHIW households are not asked about these two events, but most of the variables used in this paper as a proxy of risk are found to be important in determining the probability of household delinquency or default in the United States.

The evidence in this paper is that the price of consumer loans charged by Italian lenders seems barely connected to the specific household risk. The market for consumer loans in Italy appears more similar to one single rate market or, more precisely, to a market with very few differentiated interest rates, mainly on the basis of the household area of residence (background risk), the head of household being married (income variability) and the household having a mortgage, where this latter variable could reflect more information available on the borrower, because holders of mortgages are more likely to be scrutinized in the main Italian Credit Bureau. Prices are also differentiated according to the amount of consumer loans: small loans are more expensive, though the economic impact is small.

The rest of the paper is organized as follows. Section 2 briefly sets the stage on what theory says and empirical studies have found about the price of credit. Section 3 presents the data and Section 4 the estimation strategy. Sections 5 and 6 comment the results and Section 7 concludes.

2 What do the theory and empirical evidence say about the price of credit to households?

In principle, interest rates applied to borrowers should reflect their default risk (Geanakoplos, 2002; Chatterjee, Corbae, Nakajima and Rios-Rull, 2007). In fact, methods based on credit scoring have been increasingly used by lenders not only to accept or reject an application, but also to price the loan. The process started from small loans granted to households and then extended to business loans to small firms.

However, if the degree of asymmetric information between lenders and borrowers is high, according to the Stiglitz and Weiss (1981) model, when lenders increase the interest rates too much, they end 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. The result is an equilibrium credit rationing. This result could be less frequent for those loans where collateral can be used to screen borrowers and to alleviate the asymmetric information problem (Bester, 1985; Bester, 1987). Therefore, as for consumer loans, when they are

collateralized, such as loans to purchase a car, higher interest rates for high-risk customers can be used to clear the market together with collateral requirements. When there is no collateral, such as for credit cards or other types of consumer loans, or when the time required to recover the collateral is very long, it may be optimal for lenders to use credit limits as a rationing device, rather than differentiate interest rates on the basis of the specific risk of the borrower.

The empirical literature has mainly focused on the topic of households rationed in credit market (Jappelli, 1990; Runkle, 1991; Duca and Rosenthal, 1993). However, more recently, some studies have specifically addressed the issue of the cost of credit and of its link with credit scoring. McCorkell (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 underserved 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. 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.³

There exists also a wide literature on credit scoring and its impact on the availability of credit and its price, more frequently for business loans (Berger, Frame and Miller, 2005; ?). In particular, ? find that US banks are still more likely to use credit scoring for automatic approval/rejection of business loans (42 per cent) than for setting loan terms (32 per cent). Distinctively for Italy, Bofondi and Lotti (2006) show that the adoption of credit scoring by banks started much later than in the US (in late eighties); at the beginning of the '90s, the diffusion of this technology was still at an early stage, mainly because of a lack of comprehensive Credit Bureaus and the heavy use of "soft", i.e. qualitative, information, which make the adoption of automated credit scoring techniques more difficult.

Another parallel stream of the literature has tried to measure the price elasticity of household demand to credit (Gross and Souleles, 2002; Alessie, Houchguertel and Weber, 2005), which is useful to improve our understanding of the stickiness of the interest rates charged on consumer loans (Mester, 1994). In fact, in general these papers find that the elasticity of demand to the price

³As for business loans, ? find that in Italy, after a bank merger that 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.

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 attracting the riskiest borrowers whose demand is less elastic to price.

3 Description of the data

For the first time, the 2006 wave of the Survey of Households' Income and Wealth (SHIW) contains an indication of the interest rates charged by lenders on consumer loans. The available breakdown is 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, other etc).⁴ Households are required to write the outstanding amounts for the three different types of loans at the end of 2006; they are also asked to declare either the specific level of interest rates charged or approximately a range in which the interest rate is included.⁵

There is a caveat in using survey data for this kind of analysis. The interest rates 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, I 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. It is nonetheless worth highlighting that in the following I try a comparison between the interest rates collected in the SHIW with those reported by Italian banks and the result is comforting.

In 2006 there are 891 households in the SHIW that have a loan for at least one of the above mentioned three categories of consumer loans (around 13 per cent of the total sample). Some households have a loan in more than one of the three categories: to obtain one interest rate per household, I calculate the average with weights equal to the amounts of loans. More than one third of the 891 households (334) declare a specific interest rate; the others indicate a range. For the

⁴The SHIW is carried out every two years by the Bank of Italy. The survey 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).

⁵ 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. If more than one debt has been contracted within one of the three categories, households are asked to refer to the largest loan.

households who choose to declare a range, I recover a point indication of the price of the loan by using the probability of a uniform distribution inside each class of interest rates.⁶

After the imputation, I compare the average interest rate obtained in the SHIW for the loans at the end of 2006 with the interest rate on outstanding consumer loans of a representative sample of Italian banks for the month of December 2006 collected in the Bank Supervisory Report. The mean interest rate from the SHIW is 6.4 per cent, when excluding the zero interest rates that some households indicate; the mean interest rates in the Bank Supervisory Report is 6.9 per cent.⁷

When a household is granted a zero interest rate, financial costs are entirely borne by the dealer. Bertola, Hochguertel and Koeniger (2005) argue that 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. When considering only those households who specify the level of interest rates (334 out of 891 households with consumer loans in 2006) roughly one fourth of the households declare a zero interest rates. In section 5, I present the results of estimations run on *all* households, those with *declared* interest rates and those with *imputed* interest rates from the range, though eventually I will focus on households who have a positive interest rate, excluding those who get zero interest rates that are decided by dealers and not by lenders. However, I have tried to understand which borrowers are more likely to obtain a zero interest rate: in an unreported estimation, based only on households declaring a specific level of rates (334 households), the probability of zero interest rate is higher for older and richer households and is decreasing in the amount of consumer loans.

⁶In section 6, I assess the sensitivity of the results using a different method to attribute one single interest rate to households who declare a range. I also present the results of an estimation based only on the ranges of interest rates, assigning the level to the range, which is simple.

⁷In the Bank Supervisory Report, interest rates are reported for loans of different maturities: I average them weighting by the corresponding outstanding amounts. It is important to keep in mind that the two data are not perfectly comparable because in the SHIW households are asked about an interest rate that should include all fees, while the interest rates on the outstanding amounts in the Supervisory Report are net of fees. However, it is likely that households tend to remember better the net interest rates, which are probably those emphasized by banks and points of sale given that they are lower; this idea is also supported by the large amount of households in the SHIW who indicate zero interest rates. When I use the different method of imputation of a single interest rate, which essentially differs because the minimum interest rate in the first category is not 0 and is equal to 4, which is the minimum interest rate reported by Italian banks for December 2006, the average interest rate in the SHIW is 6.9. This value is identical to that obtained using interest rates reported by lenders.

4 Estimation method

In estimating the impact of the specific borrower’s risk on the interest rate charged by lenders on consumer loans, I start by following a similar setup as the one proposed by Edelberg (2006). Assume that a household demands a loan amount A_i and offers collateral to ensure a recovery rate l . 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 to the household I_i . 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 and l .

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

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

where X_i is a vector of variables that are measures or proxies for A_i , l , d_i , c . Among the household variables (A_i and d_i), the borrower’s default risk d_i is the focus of the estimation. The SHIW does not contain data on actual household delinquencies or default that are commonly used as a proxy for the credit score. I therefore follow the strategy of testing the explanatory power of all the variables that Edelberg (2006) uses in her probability models for a declaration of bankruptcy and for being late in payment, based on the Survey of Consumer Finance for the US households. In detail, the variables that I test are the age of the borrower, his income, his net wealth, his education, his type of occupation (self-employed versus employee), whether he is unemployed, whether he is homeowner, whether he is a single parent, whether he has a checking account, the amount of consumer loans, having a debt/income ratio higher than a certain threshold (75 percentile). I also assess other variables such as a dummy equal to 1 for households who face difficulties (from some to great difficulties) with their disposable income, a dummy for being married, a dummy for households whose debt-service is higher than the 75 percentile of the distribution, the number of income recipients, the area where the household lives and a dummy for households who also have a mortgage. In the end, most of these variables have no explanatory power in the reduced form equation for the observed interest rate charged by lenders; I therefore decide to leave some of them out of the estimation. Finally, the variables that I include in the interest rate equations, reported in Tables 1 and 2, as a proxy for the specific borrower’s risk d_i are his age, whether is married or not, his income and net wealth, whether he is self-employed, the number of income recipients, the area of residence, the amount of consumer loan and a dummy for households who also have a

mortgage.

As for the other variables used in the estimation, the cost of funding for the lenders c is assumed constant over a year. As another variable measuring bank costs, and more in general the bank market power, I also include in the equation of the observed interest rates charged by lenders an indicator of banking concentration in the local credit markets: this is measured by the the Herfindahl index based on the number of bank branches in the 95 Italian provinces. As for the recovery rate l , it should be close to a constant for non-collateralized loans. For the loans to purchase a car, which are collateralized, I try a separate estimation in Section 6 to assess the importance of the collateral. I also include in some estimations reported in Tables 1 and 2 indicators of the quantity of the loan recovered and the time for recovery in the case of borrowers' default, measured at regional level, to verify their explanatory power in the interest rate equation.⁸

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:

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

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). As a limiting case, one can imagine that a loan application has been accepted, but then the price offered by lenders I_i is higher than the customer's reservation price R_i : hence, it could be that some high-risk borrowers have indeed been offered higher prices, but they have refused to sign the contract (a sort of rationing through the price). Therefore I do not observe these cases: however, in the SHIW there are no questions allowing to single them out.⁹ However, the bank decisional process is usually that first the loan application is accepted/rejected (and at this stage high-risk borrowers can be rejected) and then the contract, including the price, is offered to the customer.

⁸These indicators 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); only mortgage proceedings for insolvency are considered.

⁹In the SHIW there is a question to verify when a household has been turned down in the credit market, though it is not possible to distinguish between mortgage and consumer loan applications and the causes of rationing.

In this framework, in order to verify the results I use a sample selection model for the estimation in (1). To identify the model it is required 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 for a loss in income or to buy a house. These attitudinal variables are included in Z_i , but not in X_i . I do not have such kind of variables in the SHIW. As exclusion restrictions, I use the fact that having a checking account is an important determinant for the probability of having a consumer loan, while this variable has no explanatory power in determining the interest rate offered by the lender. Another variable that behaves in a similar way is the dummy equal to 1 for households who face some difficulties with their disposable income: this variable is significant in the probability model for having a consumer loan, though - as a private information for the household - it cannot be used by lenders in determining interest rate and indeed has no explanatory power in the price equation.¹⁰

5 The results of the analysis

In the first subsection I present the results of the OLS estimation on the interest rates on consumer loans. In the second subsection I contrast them with the results I get with a Heckman model that does take into account the selection problem. In the other two subsections, I study first the impact on the interest rates of searching for better financial conditions when demanding a consumer loan; then, I focus on the influence of having a mortgage.

5.1 The baseline estimation

In Table 1 second column, I first present the estimation on 891 households: this sample gathers together households with both declared and imputed interest rates and also includes those households who get a zero interest rate. In the third column I focus only on the households who have a consumer loan with a positive interest rate (815). Then I consider the households who report a specific level of interest rate only, without including in the estimation the imputed rates, and as in the third column, I exclude the zero rates: in this case, the number of households remarkably drops to 255. Finally, in the last column, I include indicators of the loan recovery in the case of

¹⁰It is also worth noting that variables such as income and wealth are quite important in the selection equation, though they are not significant in the equation for the interest rates. This also helps identifying the model.

borrowers' default to verify their explanatory power.¹¹

The results are not very different when comparing the first and the second estimations in Table 1. The only specific characteristics of the borrower that appear to be significant for the determination of the price of the loan are his age and whether is married or not. Specifically, in the estimation that excludes the zero interest rates (third column), which I focus on, the price of the loan is lower for married borrowers. Many other variables that in principle should play a role in determining the specific borrower's risk of default or delinquencies, such as income, net wealth, and the type of occupation, have no effect in the interest rate equation.

Further, the amount of consumer loan has a decreasing effect on the interest rate, as generally the loans for to purchase a vehicle are larger and charged with lower interest rates because they are collateralized; small loans for buying non-durable goods or for not specified purposes are more expensive. When a household has also a mortgage, the interest rates on consumer loans tend to be lower: this could be due to the fact that these households are likely to be monitored in the main Italian Credit Bureau (Centrale dei Rischi, where all the loans larger than 75,000 euros are reported) and therefore there is more information available on them.

Finally, the area where the household lives has a very important effect on the interest rates of consumer loans: *ceteris paribus*, households living in the South pay an interest rate that is 1 point higher than those living in the North. As explained in the previous section, I try to understand the importance of legal enforcement in determining this result: in the last column of Table 1, I report an estimation where I drop the dummy South and I include a measure of the quantity of the loan recovered in the case of customers' default and the time required. I need to drop the dummy South because of the high collinearity with the variable measuring the time required for loan recovery: indeed, the time required for legal enforcement of the loan contract in the case of borrowers' default has a significant and positive effect on the interest rate charged by lenders to consumer loans.¹² I also try with a measure of the background risk that banks face in each Italian province, i.e. the ratio between bad and total bank loans to households, which turns out to increase the interest rates charged by lenders to households (unreported).¹³

When I consider only those households with declared and positive interest rates (fourth column),

¹¹Robust standard errors are calculated in all estimations; they are also adjusted for clustering in the 95 provinces to allow some correlation between observations in the province of residence.

¹²Similar results have been found with another indicator, the average value of the length of civil trials for the period 1995-1998, measured at provincial levels.

¹³This indicator is also highly collinear with the area dummy for the Southern regions (0.66); they cannot therefore be used simultaneously.

the results are not too different from the baseline case reported in the third column, though the significance of some results vanishes due to the lower number of observations. Essentially, the interest rate is higher in the Southern regions and decreases with the amount of the consumer loan.

In order to verify the economic importance of the statistically significant variables in the regression, I perform the following exercise. I define two types of borrowers: a low-risk and a high-risk customer. I put some of the variables at the mean value in the sample: this is done for the type of occupation, the number of income recipients and the value of the Herfindahl index in the local credit market. Then I consider as a low-risk borrower a household whose head is married, has an age, net income and net wealth equal to the third quartile of their distribution, has a mortgage, lives in the North and has an amount of consumer loan equal to the third quartile of the distribution. On the contrary, the high-risk borrower is a household whose head is not married, has an age, net income and net wealth equal to the first quartile of their distribution, has no mortgage, lives in the South and has an amount of consumer loan equal to the first quartile of the distribution. The spread between the interest rates charged to the high and the low-risk borrowers is roughly 2 percentage points: 7.5 per cent is the rate for high-risk borrower, 5.4 per cent for the low-risk borrower.¹⁴ On the whole, this spread is wide, though the most important variable in determining it is living in the South, which accounts for by around 1 percentage point. However, the area of residence is not linked to the *specific* risk of the borrower, but rather reflects a sort of *background* risk. After the area of residence, the other variables affecting the spread are not being married, which could be a proxy of the household income variability¹⁵ and contributes by around 0.5 point, and not having a mortgage, which reflects the informational effect and has a similar impact.

5.2 The Heckman estimation

In Table 2, I report the results of a Heckman estimation that accounts for sample selection. I consider only the households with declared and imputed interest rates, excluding the zero rates (815 households). On the basis of the identification conditions mentioned in the previous section, a Wald test, reported in the last row of the Table, does not reject the hypothesis that the two equations, the probability model of having a consumer loan and the interest rate equation, are

¹⁴The predicted average interest rate obtained at the mean values of all the variables in the estimation is equal to 6.2 per cent.

¹⁵In the sample used for the estimation, among households whose head is not married, the percentage of those who have just one income recipient is 62 per cent, while those who have two income recipients account for 27 per cent. Among households whose head is married the first percentage is halved (31 per cent) and the second increases to 52 per cent.

independent. Actually the results of the interest rate equation, after considering the selection problem, are very similar to those reported in the third column of Table 1.¹⁶

In the selection equation, many variables have the expected sign. The probability of having a consumer loan increases with the age of the borrower at a decreasing rate, is higher for married couple, increases in the number of income recipients and in income, decreases in net wealth (the latter is likely to be a demand effect), is higher when a household has a mortgage and for those with a checking account. However, there is also evidence that households having a consumer loan are potentially riskier: the probability is higher for households facing difficulties with their disposable income and for rationed households.¹⁷ Overall, most of the variables that are proxies of the specific household risk seem to be important in determining the access to the credit market for consumer loans, rather than the price of the contract once the application has been accepted. This points to the fact that in the consumer loan market, Italian lenders seem to work in a way that is similar to that depicted in the Stiglitz and Weiss (1981) model: they do not discriminate the price of the loan on the specific risk of the borrower, rather they fix an upper-bound for the interest rate and reject the applications of the borrowers who are perceived as the riskiest.

In the last two columns of Table 2, I report the results of an estimation similar to that in the last column of Table 1: I exclude the dummy South and include indicators of legal enforcement of the loan contract in both equation. As before, the interest rates on consumer loans are higher when the time for loan recovery is longer. In addition, the probability of having a consumer loan is higher when the quantity recovered is larger and when the time for recovery is shorter.

5.3 The effect of searching for better financial conditions

This subsection analyzes the impact of searching for better financial conditions when asking for a consumer loan. In the 2006 SHIW 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

¹⁶This is true also for the other specifications reported in Table 1.

¹⁷As mentioned before, in the SHIW you can single out those households who have been turned down, totally or partially, in the credit market, though it is not possible to distinguish between mortgage and consumer loan applications. However, among people holding a consumer loan, the dummy being rationed is more likely to refer to households who have been turned down when asking a mortgage, for example for renovating the house, and who have consequently tried to obtain some money through consumer loans (roughly 90 per cent of households who have a consumer loans and have been rationed do not have any mortgage). On the whole, around 2 per cent of the 891 households with a consumer loans have been rationed: the dummy rationing is significant only in the selection equation and hence helps the identification of the model. I have also tried an estimation without this dummy variable in the selection equation: the results are similar.

bank that offered better *non financial* conditions (for example faster application) 4) it is the first bank I asked for the loan. Roughly 44 per cent of households choose the bank using the second criterion.

Both the direct and the indirect effect of searching are considered. The direct effect is measured by including a dummy equal to 1 for households searching for better financial conditions. The indirect effect captures which variables are more important in the determination of the interest rates for those households who compare the financial conditions among competitors; it is measured through the interaction terms between some of the variables in the equation and the previous dummy.

In Table 3, I report the results of Heckman estimations only for the variables of interest. The other results are omitted as they are very similar to those reported in Table 2. The direct effect on the interest rate of the search dummy, equal to one for households who choose the bank on the basis of financial conditions, is negative though not significant. Then I report the results for the variables for which the interaction term is significant. The most interesting result is that an increase in household income reduces the interest rate charged by banks only for households who search for better financial conditions. Therefore, for the searching households the price of consumer loan seems to be connected to income with the expected sign and hence more risk-based. It is also interesting to note that households who are granted a larger consumer loan can obtain a reduction in interest rates only if they search. More difficult to explain, the dummy Center has a negative sign only for searching households.¹⁸

5.4 The effect of having a mortgage

Out of the 891 households with consumer loans in 2006, 19 per cent have also a mortgage. As already argued, on the one hand households with mortgage are more likely to be included in the Italian Credit Bureau. Therefore there is more information available on them and *ceteris paribus* this could reduce the interest rate charged on their loans. This is the direct effect I have stressed commenting the result in Tables 1 and 2 concerning this dummy. On the other hand, a household who has a mortgage and a consumer loan as well can be considered riskier by lenders, as this entails an increase in his total debt service.¹⁹

¹⁸When I include the direct effect, never significant alone, along with the interaction effects, the coefficients of interaction effects are no longer significant.

¹⁹In 2006, the median debt service ratio on disposable income for the group of households who have only consumer loans is equal to 6 per cent; for the group of households who have also a mortgage the median debt service is threefold, equal to 18 per cent.

In Table 4, I report the result of Heckman estimations with interaction terms between the dummy whether the household has a mortgage or not and the same variables as in Table 3. In this case, I keep the direct effect in the estimation because it is always negative and significant. On the contrary, none of the interactions terms in Table 4 are significant, excluding the one referring to the amount of consumer loan.²⁰ The results of this exercise is interesting as it somehow reflects the two possible opposing effects of having a mortgage: the direct, informational effect, which decreases the interest rates, and the indirect effect, measured by the coefficient of the interaction term with the amount of consumer loan, which is positive, significant and higher in absolute value than the negative coefficient of the amount of consumer loan. The latter result therefore says that as long as the amount of consumer loan increases, the interest rate charged by the bank decreases. However, for households who also hold a mortgage the opposite is true, probably because they are considered riskier by the lender due to their higher debt service.

6 Sensitivity and extension analysis

6.1 Sensitivity exercises

In the previous estimations I include both the households who declare a specific interest rate and those who specify a range, for whom I impute a point interest rate. In Table 1, I verify the results when I just consider the households who declare a specific interest rates: however, in this case, the number of observations sharply declines to 255 households. I therefore start this section by assessing the results commented in the previous section by using only the classes of interest rates, rather than specific levels of rates. I easily classify the point interest rates in classes. After that, I run the following estimation: I check what variables determine the probability for the household of being in the three highest categories of interest rates, i.e. being charged an interest rate for consumer loans higher than 9 per cent. Around 14 per cent of households are in these high categories: 9 per cent in the 9-12 per cent category and 5 per cent in the categories with interest rates higher than 12 per cent.

I run a censored Probit estimation that does take into account the selection problem. The results are presented in Table 5.²¹ Overall, they are very similar to those reported in Table 2. The probability of being charged a very high interest rate is lower for married couple and for households having a mortgage; it decreases with the amount of consumer loan and, *ceteris paribus*, is far

²⁰I have tried also some other variables interacted, but the coefficients are always not significant.

²¹Similarly to the Heckman estimations, a Wald test does not reject the hypothesis that the two equations are independent.

higher for households living in the Southern regions. The only difference is that with this kind of estimation there is also evidence that the probability of a higher interest rate is increasing in the household net wealth.²² As for the interaction terms with a dummy equal to 1 for the households who search for better financial conditions, the signs of the coefficients (unreported) are similar to those in Table 3, though they are less precisely estimated.

In all household surveys net wealth is affected by under-reporting, which is usually increasing with the level of wealth. This is true also in the SHIW, particularly for the financial component of the household net wealth. To assess the impact of this under-reporting on the earlier results, I try similar estimations as those reported in Tables 1 and 2 excluding household net wealth: the evidence is unchanged (unreported).

I have also run a test of robustness of the results which consists in verifying what happens when I change the method to impute a specific interest rate to households who specify a range for them. This new method essentially differs from the one previously used because the minimum interest rate in the first category is not 0, but equal to 4, which is the minimum interest rate reported by Italian banks in the Supervisory Report for December 2006. Unreported estimations show that the results are very similar to those previously commented. In particular, when I try to evaluate the economic impact of different variables that matter in the interest rate equation, I still find that there is a spread of 2 percentage points between the rate charged to high-risk and low-risk borrowers: as in the baseline case, half point is explained by the fact of not being married, another half point by the fact of not having a mortgage and 1 percentage point by the fact that the household lives in Southern regions.

6.2 Extensions

An extension of the analysis consists in assessing the results considering only consumer loans for the purchase of a motor vehicle, mainly a car. I am interested in these loans because they are easily collateralized; the parameter l , which measures the recovery rate in the model of section 4, could therefore 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)

²²I try to understand better this unexpected result and I discover that when I include the interaction terms with the dummy having a mortgage (unreported), the positive sign of net wealth appears only for households who have a mortgage. Therefore, it could be that net wealth, which is mainly made of the value of the house of residence, just represents a proxy of the amount of the mortgage carried on by the household. As said before, for households who have a mortgage, an increase in the amount of debt seems to entail a higher interest rate charged by lenders on consumer loans, probably because these households are perceived as riskier for their higher debt service.

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. The results of this estimation are in Table 6. They are very similar to those reported for the baseline estimation (Table 2): very few typical proxies of the specific household risk are significant. Essentially, the interest rates charged on the loans to buy a car decrease with the amount of the loan. The area where the household lives is again the most important determinant of the price of the loan: as before, it explains half of the spread (2.4 points) between the high-risk and low-risk borrowers. Similar results are also obtained for the interaction terms with a dummy equal to one for households who search for better financial conditions and with a dummy equal to one for households who also have a mortgage. In conclusion, like for all consumer loans, even in the presence of collateral lenders do not seem to decide prices on the basis of the specific risk characteristics of the borrowers. The background risk of the area where the household lives is still the main important driver of the price.

Another exercise, albeit far from the focus of the paper, consists in assessing the pricing for mortgages. This exercise is interesting because mortgages are typically collateralized loans and, besides, more information is available for them. Interest rates on mortgages for the house of residence have been asked in the SHIW since 1995 and they are split between fixed and variable interest rates. I therefore run two separate Heckman estimations, one for the pricing of mortgages granted at variable rate (2 and 3 columns, Table 7) and the other for the pricing of mortgages granted at fixed rates (4 and 5 columns, Table 7). I partially change the identification conditions for the sample selection model: in the selection equation I cannot include a dummy for households facing difficulties with disposable income, as this variable is available only since 2002. Compared to the previous estimations, I also include dummies for being a single parent, for living in small municipalities and for being homeowner, which are significant in the selection equation, while they are not in the interest rate equation. The evidence is that there seems to be a link between the price of mortgages at variable rates and some of the traditional proxies of the specific household risk, such as households income (negative sign), education (negative sign), which can be seen as a measure of lifetime income, and being unemployed (positive sign). The variable interest rates also decrease with the amount of mortgage.²³ Unlike for consumer loans, the area where the household lives turns out to be not significant in the estimation of the prices charged by lenders, though people living in the Center or South Italy are less likely to have a mortgage. As for the fixed interest rates

²³Interest rates apparently increase with net wealth. When I drop this variable, the self-employment dummy has a positive sign and is almost significant. It is therefore likely that higher wealth captures the type of occupation, given that average net wealth is far higher for self-employed.

on mortgages the evidence is entirely different. The price of this type of loans seems to be totally unrelated to any proxy of the specific household risk. The price only decreases with the amount of mortgages. The area where the household lives has still no explanatory power in this estimation, neither in the selection equation.²⁴ Overall, at least for the price of mortgages granted at variable rates, it seems true that the presence of collateral and more information obtained through the Credit Bureau, which helps screening among borrowers, give the lenders some incentives to differentiate more the prices of loans on the basis of the specific borrower risk.

7 Discussion and conclusion

The evidence in this paper shows that in Italy the price of consumer loans seems barely connected to the specific household risk of delinquency or default. However, unlike for the price, many proxies of the specific household risk are in fact significant in determining the probability of having a consumer loan: this probability increases with the age of the household head, with the household income and with the number of income recipients.

Overall, the Italian market for consumer loans seems to be a world not too different from the one drawn in Stiglitz and Weiss (1981), where banks are unable to observe the specific borrower's risk, they cannot discriminate among customers and hence they prefer to offer the same standard contract and exclude from the market the riskiest households. More precisely, this seems to be a market with very few differentiated interest rates, mainly on the basis of the area where the household lives (background risk), on the fact that the household head is married or not (variability of the income) and on the household having a mortgage, where this latter variable could reflect more information available on the borrower in the main Italian Credit Bureau. In addition, there are different interest rates according to the amount of the loan: for very small loans the price tends to increase, although after controlling for other variables the economic impact of the amount of the loan is very small.

Another evidence of this paper concerns households who choose the bank granting the consumer loan on the basis of financial conditions. For these "searching people", when household income increases, the interest rate decreases. Therefore one important proxy of the specific household risk, like the income, matters in determining the price of the loan set by the lender. This is an indication

²⁴When I run the same estimations only for the years since 2000, in order to verify whether prices for mortgages have become more risk-based in the current decade, the result for variable interest rates are roughly similar, though the education loses significance. On the contrary, the price of loans granted at fixed rate is more connected to some proxy of the specific household risk: it is negatively related to household net wealth and is higher for self-employed.

that better products are available to customers who need to search for them.

A possible further extension of the analysis is based on using directly in the estimation the probability of being late in the repayment of debt as a proxy for the specific household risk. As mentioned, there are no questions on this topic in the SHIW. However, this variable is measured in an Istat survey about the ways of living of Italian households (EU-SILC). It is therefore possible to calculate a probability model based on this survey and then use the coefficients to predict the probability of delinquencies in the SHIW.

References

- Alessie, R., Houchguertel, S. and Weber, G. (2005). Consumer credit: Evidence from italian micro data, *Journal of European Economic Association* **3**(1): 144–178.
- Berger, A., Frame, W. and Miller, N. (2005). Credit scoring and the availability, price and risk of small business credit, *Journal of Money, Credit and Banking* **37**(2): 191–222.
- Bertola, G., Hochguertel, S. and Koeniger, W. (2005). Dealer pricing of consumer credit, *International Economic Review* **46**(4): 1103–1142.
- Bester, H. (1985). Screening vs. rationing in credit markets with imperfect information, *The American Economic Review* **75**(4): 850–855.
- Bester, H. (1987). The role of collateral in credit markets with imperfect information, *European Economic Review* **31**: 887–99.
- Bofondi, M. and Lotti, F. (2006). Innovation in the retail banking industry: The diffusion of credit scoring, *Review of Industrial Organization* **28**: 343–358.
- Bostic, R. (2002). Trends in equal access to credit products, in T. Durkin and M. Staten (eds), *The Impact of Public Policy on Consumer Credit*, Kluwer Academic Publishers, Massachusetts.
- Brandolini, A. and Cannari, L. (1994). The Bank of Italy’s Survey of Households Income and Wealth, in A. Ando, L. Guiso and I. Visco (eds), *Saving and the Accumulation of Wealth*, Cambridge University Press, Cambridge, pp. 369–86.
- Chatterjee, S., Corbae, D., Nakajima, M. and Rios-Rull, J. (2007). A quantitative theory of unsecured credit with risk of default, *Econometrica* **75**(6): 1525–1589.
- Duca, J. and Rosenthal, S. (1993). Borrowing constraints, household debt and racial discrimination, *Journal of Financial Intermediation* **3**: 77–103.
- Edelberg, W. (2006). Risk-based pricing of interest rates for consumer loans, *Journal of Monetary Economics* **53**: 2283–2298.
- Geanakoplos, J. (2002). Liquidity, default and crashes: Endogenous contracts in general equilibrium. Discussion Paper 1316RR, Cowles Foundation.

- Gross, D. and Souleles, N. (2002). Do liquidity constraints and interest rates matter for consumer behavior? evidence from credit card data, *The Quarterly Journal of Economics* **117**(1): 149–185.
- Jappelli, T. (1990). Who is credit constrained in the U.S. economy, *Quarterly Journal of Economics* **105**(1): 219–34.
- Johnson, R. (1992). Legal, social and economic issues in implementing scoring in the United States, in J. Crook, D. Edelman and L. Thomas (eds), *Credit Scoring and Credit Control*, Oxford University Press, New York.
- McCorkell, P. (2002). The impact of credit scoring and automated underwriting on credit availability, in T. Durking and M. Staten (eds), *The Impact of Public Policy on Consumer Credit*, Kluwer Academic Publishers, Massachussets, pp. 209–219.
- Mester, L. (1994). Why are credit card rates sticky?, *Economic Theory* **4**: 505–30.
- Runkle, D. (1991). Liquidity constraints and the permanent-income hypothesis: Evidence from panel data, *Journal of Monetary Economics* **27**(1): 73–98.
- Stiglitz, J. and Weiss, A. (1981). Credit rationing in markets with imperfect information, *American Economic Review* **71**: 393–409.

Tables and figures

Table 1: The impact of borrower's risk on consumer loans interest rates
(OLS estimations)

Variables	All households		Excluding zero interest rates		Only declared interest rates		With legal enforcement	
Age	-0.122 (0.068)	*	-0.061 (0.063)		-0.140 (0.117)		-0.058 (0.063)	
Age sq	0.001 (0.001)	*	0.001 (0.001)		0.002 (0.001)		0.001 (0.001)	
Married	-0.392 (0.315)		-0.466 (0.277)	*	-0.072 (0.437)		-0.386 (0.275)	
Income (000 euros)	-0.016 (0.022)		-0.002 (0.022)		-0.004 (0.039)		-0.005 (0.023)	
Income (000 euros) sq.	0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.000)	
Net wealth (000 euros)	- 0.000 (0.001)		0.000 (0.001)		0.001 (0.002)		0.000 (0.001)	
Net wealth (000 euros) sq.	0.000 (0.000)		0.000 (0.000)		0.000 (0.000)		0.000 (0.002)	
Self-employed	0.388 (0.364)		0.181 (0.286)		-0.292 (0.410)		0.143 (0.291)	
No. income recipients	0.161 (0.223)		0.083 (0.226)		-0.042 (0.309)		0.109 (0.226)	
Center	-0.320 (0.391)		-0.434 (0.331)		-0.551 (0.470)		-0.598 (0.324)	*
South	0.972 (0.489)	**	1.038 (0.454)	**	1.287 (0.705)	*		
Amount of loan (000 euros)	-0.009 (0.005)	*	-0.013 (0.003)	***	-0.009 (0.003)	***	-0.013 (0.003)	***
Has a mortgage	-0.508 (0.276)	*	-0.480 (0.281)	*	-0.228 (0.499)		-0.479 (0.287)	*
Herfindahl (province)	0.412 (3.569)		-0.959 (3.613)		-7.097 (6.666)		0.262 (3.594)	
Quantity recovered							0.028 (0.025)	
Time for recovery							0.021 (0.010)	**
Constant	8.795 (1.553)	***	7.915 (1.374)	***	10.228 (2.500)	***	4.888 (2.349)	**
No. observations	891		815		255		815	
R ²	0.039		0.037		0.089		0.033	
Period	2006		2006		2006		2006	

Robust standard errors, adjusted for 95 clusters in provinces, are in brackets.* significant at 10%, ** at 5% and *** at 1%. In column 2 are included all households both with declared and with imputed interest rates. In column 3 households with zero interest rates are excluded. In column 4 are included only households who declare a specific level of interest rates (not a range); households with zero interest rates are excluded. In column 5 I consider the same sample as in column 3 and I include indicators of legal enforcement of loan contracts.

Table 2: The impact of borrower's risk on consumer loans interest rates
(Heckman estimations)

Variables	Interest rates		Selection equation		Interest rates		Selection equation	
Age	-0.068		0.022	**	-0.066		0.024	**
	(0.062)		(0.010)		(0.061)		(0.010)	
Age sq	0.001		-0.000	***	0.001		-0.000	***
	(0.001)		(0.000)		(0.001)		(0.000)	
Married	-0.509	*	0.155	***	-0.424		0.150	***
	(0.286)		(0.039)		(0.284)		(0.039)	
Income (000 euros)	-0.004		0.016	***	-0.008		0.018	***
	(0.022)		(0.004)		(0.023)		(0.004)	
Income (000 euros) sq.	0.000		-0.000	***	0.000		-0.000	***
	(0.000)		(0.000)		(0.000)		(0.000)	
Net wealth (000 euros)	0.000		-0.001	***	0.000		-0.001	***
	(0.001)		(0.000)		(0.001)		(0.000)	
Net wealth (000 euros) sq.	-0.000		0.000	***	-0.000		0.000	***
	(0.000)		(0.000)		(0.000)		(0.000)	
Self-employed	0.171		0.088		0.134		0.084	
	(0.278)		(0.076)		(0.283)		(0.077)	
No. income recipients	0.058		0.070	**	0.087		0.062	*
	(0.231)		(0.035)		(0.232)		(0.036)	
Center	-0.450		0.080		-0.646	*	0.213	***
	(0.325)		(0.077)		(0.324)		(0.062)	
South	1.075	**	-0.074					
	(0.441)		(0.084)					
Amount of loan (000 euros)	-0.013	***			-0.013	***		
	(0.003)				(0.003)			
Has a mortgage	-0.525	*	0.141	**	-0.520	*	0.136	**
	(0.282)		(0.065)		(0.286)		(0.064)	
Herfindahl (province)	-1.020		0.347		0.233		0.322	
	(3.549)		(0.691)		(3.535)		(0.682)	
Being rationed			0.801	***			0.801	***
			(0.181)				(0.183)	
Having a checking account			0.299	***			0.280	***
			(0.060)				(0.062)	
Having difficulties			0.311	***			0.329	***
			(0.052)				(0.051)	
Quantity recovered					0.025		0.014	***
					(0.025)		(0.003)	
Time for recovery					0.022	**	-0.004	*
					(0.010)		(0.002)	
Constant	8.611	***	-2.370	***	5.656	***	-3.072	**
	(1.505)		(0.249)		(2.514)		(0.366)	
No. observations	815		7,692		815		7,692	
Period	2006				2006			
Wald test indep. eqns.	0.4340				0.4814			

Robust standard errors, adjusted for 95 clusters in provinces, are in brackets.* significant at 10%, ** at 5% and *** at 1%. Being rationed is a dummy equal to 1 for households who have asked for a loan and have been turned down totally or partially. The dummy having difficulties identifies households who have from some to great difficulties with their disposable income.

Table 3: The importance of searching for better financial condition
(Heckman estimations)

Variables	Direct effect	Interaction with income	Interaction with Center	Interaction with loan	
Search dummy	-0.418 (0.286)				
Income (000 euros)		0.008 (0.008)			
Income*Search dummy		-0.011 (0.065)	*		
Center			-0.038 (0.421)		
Center*Search dummy			-1.026 (0.460)	**	
Amount of loan (000 euros)				0.024 (0.021)	
Amount*Search dummy				-0.039 (0.021)	*
No. observations	815	815	815	815	
Period	2006	2006	2006	2006	

Robust standard errors, adjusted for 95 clusters in provinces, are in brackets.* significant at 10%, ** at 5% and *** at 1%. Search is a dummy equal to 1 for households who choose the bank that offers better financial conditions compared to other competitors. Other possible choices were: chosen because it is the unique bank that gave me credit, because it offers better *non financial* conditions (for example faster application), because it is the first bank I ask the loan.

Table 4: The importance of having a mortgage
(Heckman estimations)

Variables	Direct effect	Interaction with income	Interaction with Center	Interaction with loan	
Has a mortgage	-0.525 *	-1.034 *	-0.625 *	-0.837 ***	
	(0.282)	(0.546)	(0.336)	(0.321)	
Income (000 euros)		0.001			
		(0.009)			
Income*Has a mortgage		0.012			
		(0.010)			
Center			-0.524		
			(0.335)		
Center*Has a mortgage			0.380		
			(0.567)		
Amount of loan (000 euros)				-0.015 ***	
				(0.003)	
Amount*Has a mortgage				0.035 **	
				(0.017)	
No. observations	815	815	815	815	
Period	2006	2006	2006	2006	

Robust standard errors, adjusted for 95 clusters in provinces, are in brackets.* significant at 10%, ** at 5% and *** at 1%.

Table 5: The impact of borrower's risk on consumer loans interest rates
(Probit censored estimations)

Variables	Interest rates equation		Selection equation	
Age	0.000 (0.024)		0.022 (0.010)	**
Age sq	0.000 (0.000)		-0.000 (0.000)	***
Married	-0.266 (0.111)	**	0.155 (0.038)	***
Income (000 euros)	-0.008 (0.010)		0.016 (0.004)	***
Income (000 euros) sq.	0.000 (0.000)		-0.000 (0.000)	***
Net wealth (000 euros)	0.000 (0.000)	**	-0.001 (0.000)	***
Net wealth (000 euros) sq.	-0.000 (0.000)	**	0.000 (0.000)	***
Self-employed	0.053 (0.192)		0.088 (0.076)	
No. income recipients	-0.032 (0.096)		0.069 (0.035)	**
Center	-0.245 (0.158)		0.080 (0.077)	
South	0.517 (0.178)	***	-0.076 (0.084)	
Amount of loan (000 euros)	-0.019 (0.010)	*		
Has a mortgage	-0.250 (0.149)	*	0.142 (0.065)	**
Herfindahl (province)	-2.097 (1.435)		0.347 (0.690)	
Being rationed			0.838 (0.179)	***
Having a checking account			0.287 (0.066)	***
Having difficulties			0.307 (0.054)	***
Constant	0.081 (0.938)		-2.363 (0.251)	***
No. observations	815		7,692	
Period	2006			
Wald test indep. eqns.	0.1786			

Robust standard errors, adjusted for 95 clusters in provinces, are in brackets.* significant at 10%, ** at 5% and *** at 1%. The dependent variable is a dummy equal to 1 for households who are charged an interest rates in the highest three classes, i.e. an interest rate higher than 9 per cent. Being rationed is a dummy equal to 1 for households who have asked for a loan and have been turned down totally or partially. The dummy having difficulties identify households whose income is sufficient to see through to the end of the month only with difficulties (from some to great difficulties).

Table 6: The impact of borrower's risk on interest rates for loans to purchase of a car
(Heckman estimations)

Variables	Interest rates equation		Selection equation	
Age	-0.095 (0.076)		0.023 (0.011)	**
Age sq	0.001 (0.001)		-0.000 (0.000)	***
Married	-0.623 (0.388)		0.173 (0.044)	***
Income (000 euros)	-0.000 (0.027)		0.019 (0.004)	***
Income (000 euros) sq.	0.000 (0.000)		-0.000 (0.000)	***
Net wealth (000 euros)	0.000 (0.001)		-0.000 (0.000)	***
Net wealth (000 euros) sq.	-0.000 (0.000)		0.000 (0.000)	***
Self-employed	0.306 (0.354)		0.161 (0.067)	**
No. income recipients	0.146 (0.264)		0.080 (0.034)	**
Center	-0.477 (0.321)		0.106 (0.079)	
South	1.327 (0.448)	***	0.012 (0.092)	
Amount of loan (000 euros)	-0.032 (0.018)	*		
Has a mortgage	-0.317 (0.363)		0.115 (0.063)	*
Herfindahl (province)	0.547 (3.311)		-0.007 (0.807)	
Being rationed			0.610 (0.183)	***
Having a checking account			0.265 (0.069)	***
Having difficulties			0.273 (0.054)	***
Constant	8.849 (1.820)	***	-2.665 (0.286)	***
No. observations	578		7,725	
Period	2006			
Wald test indep. eqns.	0.4948			

Robust standard errors, adjusted for 95 clusters in provinces, are in brackets.* significant at 10%, ** at 5% and *** at 1%. In this table I only consider consumer loans for the purchase of a car. Being rationed is a dummy equal to 1 for households who have asked for a loan and have been turned down totally or partially. The dummy having difficulties identify households whose income is sufficient to see through to the end of the month only with difficulties (from some to great difficulties).

Table 7: The impact of borrower's risk on mortgage interest rates
(Heckman estimations)

Variables	Variable interest rates		Selection equation		Fixed interest rates		Selection equation	
Degree	-0.401 (0.127)	***	0.143 (0.036)	***	-0.055 (0.218)		0.138 (0.033)	***
College	-0.482 (0.214)	**	0.181 (0.047)	***	0.547 (0.313)	*	0.142 (0.056)	**
Age	0.027 (0.032)		0.024 (0.008)	***	-0.016 (0.064)		0.029 (0.007)	***
Age sq	-0.000 (0.000)		-0.001 (0.000)	***	0.000 (0.001)		-0.000 (0.000)	***
Married	-0.106 (0.181)		0.472 (0.042)	***	0.046 (0.233)		0.317 (0.043)	***
Income (000 euros)	-0.018 (0.006)	***	0.002 (0.001)		-0.005 (0.010)		0.002 (0.002)	
Income (000 euros) sq.	0.000 (0.000)	**	0.000 (0.000)		0.000 (0.000)		0.000 (0.000)	
Net wealth (000 euros)	0.001 (0.001)	*	-0.001 (0.000)	***	-0.000 (0.001)		-0.000 (0.000)	***
Net wealth (000 euros) sq.	-0.000 (0.000)	*	0.000 (0.000)	***	0.000 (0.000)		0.000 (0.000)	***
Self-employed	0.178 (0.177)		0.040 (0.043)		0.189 (0.233)		-0.112 (0.050)	**
No. income recipients	0.110 (0.102)		-0.063 (0.025)	*	-0.143 (0.145)		-0.017 (0.022)	
Center	0.133 (0.267)		-0.262 (0.055)	***	-0.158 (0.292)		0.064 (0.041)	
South	-0.105 (0.230)		-0.519 (0.066)	***	0.196 (0.296)		-0.046 (0.056)	
Amount of mortgage (000 euros)	-0.003 (0.002)	**			-0.012 (0.003)	***		
Herfindahl (province)	-0.145 (1.258)		-0.587 (0.383)		0.190 (2.441)		0.380 (0.277)	
Being unemployed	1.483 (0.451)	***	-0.018 (0.143)		0.228 (0.884)		-0.282 (0.162)	*
High Debt/income	-0.610 (0.162)	***			0.064 (0.187)			
Having a checking account			0.517 (0.059)	***			0.417 (0.053)	***
Being a single parent			0.207 (0.081)	**			0.122 (0.080)	
Living in a small town			-0.165 (0.050)	***			-0.140 (0.044)	***
Having a house			1.825 (0.131)	***			1.405 (0.087)	***
No. observations	1,705		47,701		1,602		47,064	
Period	1995-2006				1995-2006			
Wald test indep. eqns.	0.4739				0.0564			