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Access to Finance? An Analysis in a Context
of High Risk and Low Outreach**

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Does Competition for Novice Borrowers Hurt Access to Finance? An Analysis in a Context of High Risk and Low Outreach

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The lack of access to financial services and to credit in particular is an issue in many developing countries. This paper studies the channels through which new borrowers get access to consumer loans and the effect of repayment data distribution both on that access and on subsequent bank switching by borrowers. We represent such dynamics with a simple model that incorporates different types of lenders and heterogeneity among individuals. The model assumptions are validated against data from the Argentinean banking system. The model yields a set of results that are characteristic of emerging markets: a significant share of the population is excluded from credit, including those who self-exclude, and lender type determines different lending conditions. Additionally, the model shows that distributing loan repayment data, by boosting competition for novice borrowers, may increase the share of the population with no access to credit. Following these findings, we advise focusing on improving available information for unbanked individuals, rather than expanding such information for individuals with a loan payment track record.

1. Motivation

Experience has shown that financial depth contributes not only to economic growth but also to the reduction of poverty and income inequality¹. While in developed markets, ample financial depth has been achieved in the households segment, in emerging markets such as Argentina a significant portion of households is still deprived of access to credit. Against the backdrop of this scenario, we are concerned with the development of policies with a view to promoting households access to financial services, in general, and to credit in particular.

Upon credit risk assessment of individuals a lender faces two main hindrances derived from certain features inherent to the households segment: (i) information is opaque, i.e., lack of public disclosure or sufficiently documented information; and (ii) the amount of loans is relatively small, entailing excessively high costs for a case-to-case assessment. These obstacles become tougher in markets like Argentina and other emerging markets on two grounds. On the one hand, economic informality, macroeconomic volatility and a weaker information background aggravate the problem of asymmetric information; and on the other hand, the institutions that could reduce moral hazard are weak (weak contract enforcement). These drivers exacerbate adverse selection problems and make sub-optimal equilibria more likely to occur.

Given the crucial role played by information, the creation of bureaus which may enable to ease both loan application assessment and the development of automated credit scoring systems have been welcome by academics, policy makers and the financial institutions themselves. These mechanisms have been extensively studied, showing positive effects: higher level of debtors' discipline and lower assessment (process) costs, which in turn favor competition and improve loan conditions (in short, they reduce adverse selection). In this work we argue that these effects occur in a plethora of debtors on average. However, some negative effects may become apparent in certain debtor segments, especially individuals with no loan payment track record.

Regarding individuals without a loan payment track record, it can be observed that, in spite of the difficulties associated with the financial assessment of families, there is a group of financial intermediaries which are more inclined to granting credit to this group of applicants. The aim of this paper is to study the role of these institutions as vehicles of access to the financial system as well as debtors' performance since they step into the system and, in particular, the effect of information distribution on this dynamics. With a view to performing a more systematic analysis, we have represented that dynamics in a simple model and analysed the impact of information availability and creditworthiness assessment on equilibrium interest rates and access to credit. The model lies on certain assumptions and findings regarding lender characteristics, credit conditions and debtor dynamics, which are confronted to data from the Argentine banking system.

Our study proceeds as follows. Section 2 begins with an overview of household credit in Argentina. Section 3 provides a summary of the main studies conducted on the role of information and credit to households along with the effect of information availability. A theoretical model is introduced in Section 4 and it is solved by means of simulation in Section 5. This Section also confronts the model assumptions to data from clients of

¹ See Greenwood and Jovanovic (1990) King and Levine (1993), Levine, Loayza and Beck (2001).

regulated institutions in Argentina. The conclusions in Section 6 focus on policies that may contribute to favor access to banking services.

2. Household credit in Argentina

The domestic household credit market has seen important changes in the last decades, with a strong flow of new lenders, new products and new technologies. After the 2002 crisis, credit increased very quickly. Only in 2009 did the level of family credit show a plateau, in a context of economic contraction (see Graph 2.1)². However, if the nominal amount of credit is adjusted by the evolution of salaries, no take-off can really be observed³. Additionally, the increase in the amount of credit has been accompanied by a sustained incorporation of people accessing credit for the first time. The number of people with bank or financial company credit grew from 12% of the country population by the end of 2002 to almost 22% by the end of 2010⁴. Despite this remarkable increase in the number of people who have had access to credit, this type of funding is still around 5% of GDP⁵.

Like in other markets around the world, in Argentina the importance of the retail credit segment increased within the financial business, reaching 21% of the assets of regulated institutions by the end of 2010, up from 8% in 2005⁶.

² Figures include outstanding balances as informed by financial institutions in their financial statements and off-balance-sheet accounts, loans that have been transferred to SPVs and loans granted by credit card issuers. The source of the figures for the number of individuals is the information in the Argentine Credit Registry. One person can be counted more than once.

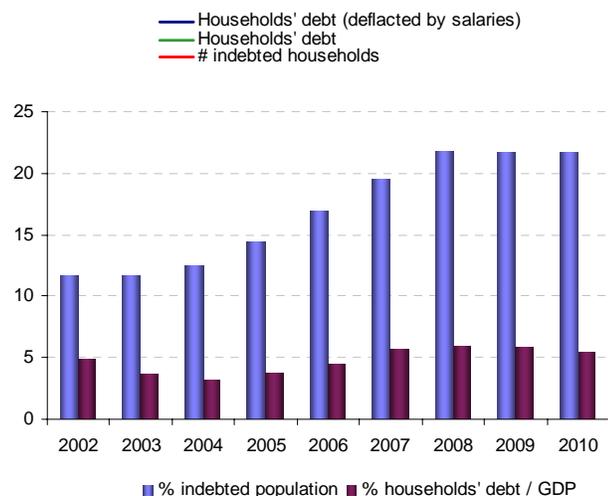
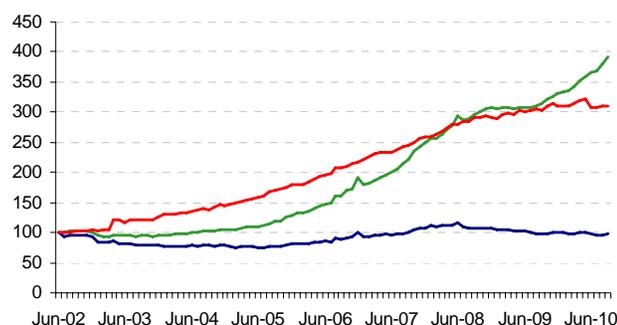
³ Household consumer credit time series has been deflated by wages (general level index) as released by INDEC National Institute of Statistics.

⁴ Including only data from the Argentine Credit Registry, i.e., from banks and regulated non-bank financial institutions.

⁵ According to surveys done by the Central Bank of Argentina, in 2009 only 17% of households had a loan (4 points of that percentage corresponding to informal creditors) and 29% had credit through installment purchases or by credit card financing (10% with the informal sector; there may be overlapping of households with loans and credit card financing). The figures on access to loans are at the same level as in 2007, while those on credit card financing went up from 19% to 29% in the period 2007-2009.

⁶ Data from financial institutions' financial statements.

Graph 2.1: Credit to households from regulated institutions



Base June 2002=100
Source: BCRA, Indec

There are different categories of lenders granting credit to households, as is also the case in most countries. These categories are the result of different regulatory obligations that different institutions must follow, the type of credit that they can grant, the sources of funding they can tap and the segment of clients they target (usually differentiating by income segment). Four categories can be identified: (i) institutions regulated by the Financial Institutions Law (in Argentina there are banks and other financial companies within this category), (ii) consumer credit companies that are not under that Law, (iii) cooperatives and mutual societies and (iv) retailer stores.

It is interesting to note that there are financial groups which comprise different types of lending businesses as subsidiaries, with different target populations. In fact, some of the most important private sector banks in Argentina have control over specialized consumer lending companies (such as credit card issuers, financial companies and micro-finance companies) and, according to their own notes to the financial statements, they tend to be identified by the income segments they target.

Unfortunately, there is no systematic database on specialized consumer lending companies, while there is data on regulated institutions, including regulated financial vehicles. Table 2.1 summarizes that information.

Table 2.1: consumer credit – outstanding by September 2010

Lender	Credit to households	
	mil. \$	in %
Banks (exclude mortgages)	66,828	70.4
Banks (mortgages)	12,714	13.4
Securitized		
banks' loans	4,829	5.1
retail stores	1,668	1.8
Nonbank credit cards issuers	8,841	9.3
Total	94,881	100.0

Source: BCRA and CNV (Argentine SEC)

Consumer lending activity requires certain level of proximity to customers. Thus the business is usually linked to investment in a network of offices or branches to provide customer services. In the period starting in 2003, this has been the case for banks and financial companies, which have opened new branches, and for specialized consumer lending companies, which have set up new companies (see Table 2.2).

Table 2.2: Access point network

	Branches (1)	ATM	Credit card issuers (2)
2004	3,926	6,123	38
2005	3,985	6,506	58
2006	4,021	6,973	83
2007	4,092	7,674	92
2008	4,106	8,707	95
2009	4,145	9,340	104
2010	4,177	10,226	92
<i>Change</i>			
2010/2004	6.4%	67.0%	142.1%

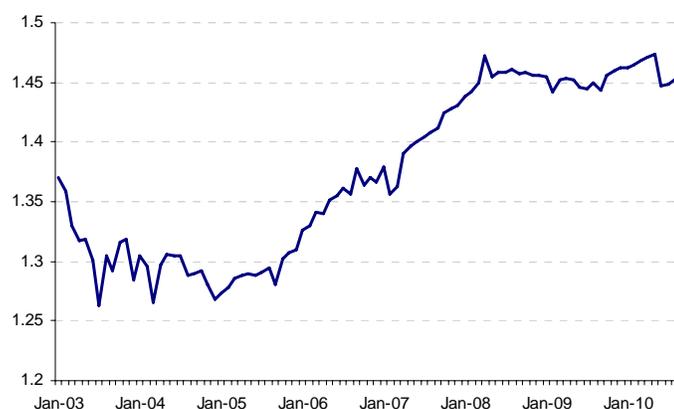
(1) Includes agencies, mobile branches, offices inside clients' enterprises

(2) Number of firms reporting to BCRA

Source: BCRA

In addition to the number of new debtors, the number of banks to which an individual is indebted has gone up (see Graph 2.2); this number would be higher if there was information on credit cards issued by banks and specialized companies.

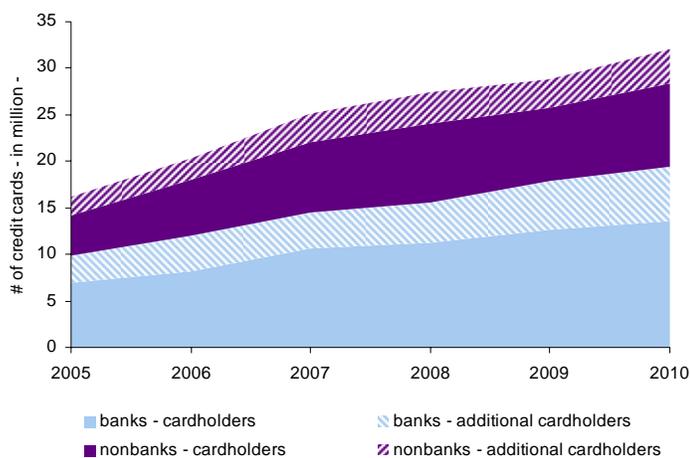
Graph 2.2: Average number of regulated credit institutions by debtor



Source: BCRA

As for credit breakdown, a very important development in Argentina and around the world has been the increasing use of open term financing, by means of credit cards. A cardholder can get financing with no certain maturity as long as he or she can decide the amount to pay back, and still avoid entering into arrears, provided the minimum payment is met as established by the card conditions. In Argentina, between 2005 and 2010 the number of credit card holders (principal cardholders and authorized users) has doubled, reaching 0.8 cards per person by the end of 2010 (see Graph 2.3). This development has been similar for cards issued by banks and by non-banks (in this document non-banks comprise financial companies and credit card issuers).

Graph 2.3: Number of credit cards



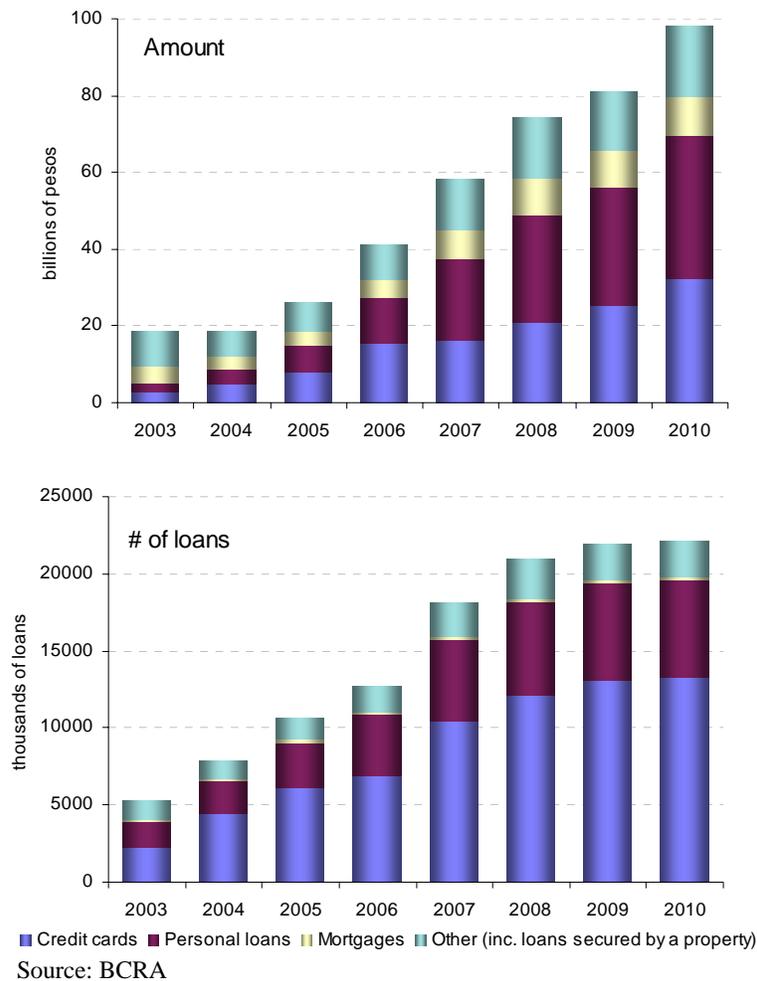
Source: BCRA

Note: According to 2010 census figures the population of Argentina is 40.1 millions, 27 millions of them above the age of 18.

As a result of the growth in this type of credit, by the end of 2010 almost 60% of credit to households was under the form of a credit card (see Graph 2.4). This growth is partially explained by the strategies developed by financial institutions to win new clients and promote customer loyalty, in some cases in association with retail stores, which seek to promote sales. Among these strategies, there have been discounts in stores, no-interest loans to buy durable goods and loyalty cards that accumulate points and provide different types of awards. In this regard, credit cards are used domestically mainly as charge cards –even if associated with an assessment of the borrower creditworthiness and credit limits–, as balances are mostly paid in full every month⁷.

⁷ Based on information provided by credit card issuers, in September 2010 credit card credit accounted for 31% of total charges in that month. The same indicator in the case of credit cards operating on national level goes down to 19%.

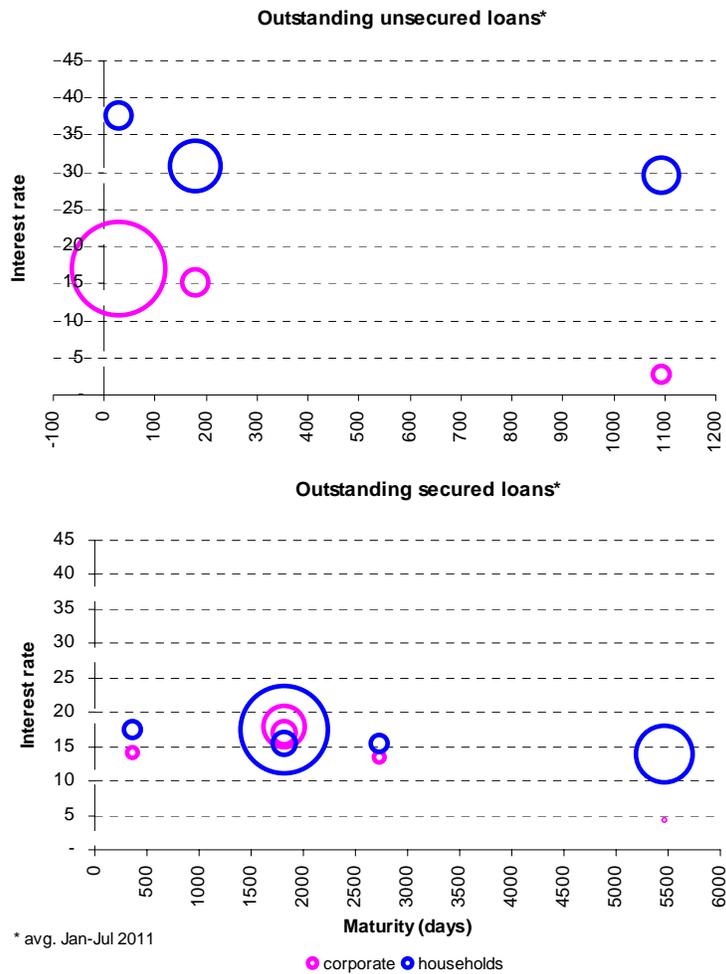
Graph 2.4: Composition of credit to households⁸



Such a remarkable growth in the retail credit card business has taken place in a context of high interest rates and low portfolio default rates. The following graphs show average interest rates (vertical axis) and granted amounts (depicted by the size of the circles) during the first half of 2011 for financial institutions regulated by the Central Bank of Argentina. As can be seen, as compared to wholesale loans, credit to individuals is associated to significantly higher interest rates and show a more significant component of long term loans. Regarding secured loans (mortgages and pledges), the difference between retail interest rates and wholesale interest rates is not so important, especially for the short term and middle term segments, but total credit amounts are much higher for individuals than for corporates.

⁸ Data from banks, financial institutions, financial trusts and credit card issuers. Mortgages figures do not include non-housing loans secured by mortgages, which are reflected in “other”.

Graph 2.5: Credit: Amounts and interest rates

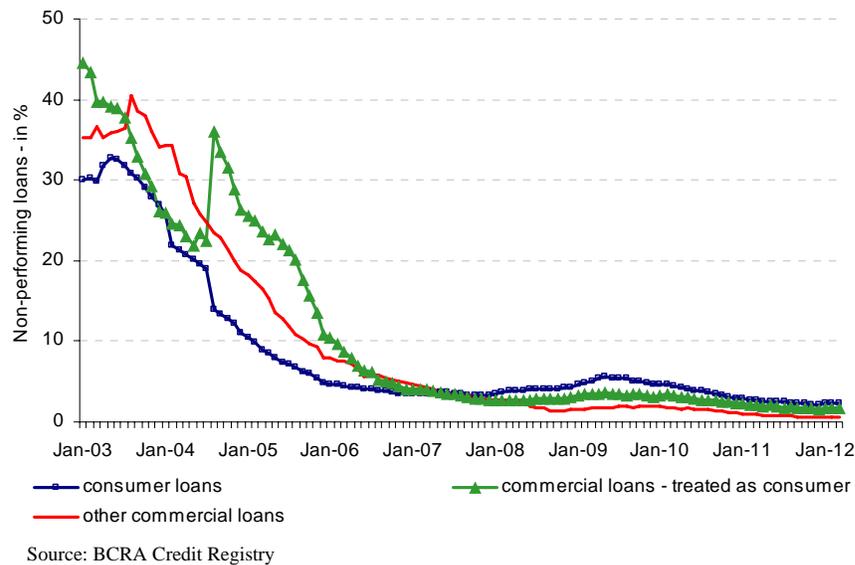


Source: SISSEN (BCRA)

Graph 2.6 shows that non-performing loans in the retail portfolio⁹ account for around 4% of the total, roughly twice the ratio of wholesale portfolio NPLs, and thus could not explain such significant differences in interest rates.

⁹ Non-performing loans ratio computes loans 90-day past due (loans classified as 3 to 6 according to domestic regulation) to total loans.

Graph 2.6: Non-performing rates



Additionally, as from 2005 approximately 15 billion pesos of retail loans have been securitized, what makes this type of credit more attractive for originating institutions.

Summarizing, the post-crisis period has shown a growing market in terms of the incorporations of new debtors and the number of credit sources each individual can have access to. Nevertheless, access to credit has still been limited to a very low percentage of the population (22% of the total) and expensive.

3. Background literature – the role of information and household credit

The credit worthiness assessment that financial institutions carry out is basically an estimation of a debtor's financial solvency. If there is a lack of information to assess debtors' insolvency risk (information is "opaque"), an asymmetric information problem arises and resource allocation is affected. Whenever possible, financial institutions will ask for collateral to supplement future solvency estimations or to replace them with the analysis of collateral risk.

The creation of data sharing systems, such as credit bureaus or credit information agencies, has been proposed to mitigate information problems. The focus of theoretical and empirical research has traditionally been on the average effects on the universe of debtors, of a symmetrical improvement in available information (i.e., information availability improves equally for all participants), deriving from this data sharing. The conclusion from this research is that the exchange of information among lenders can (i) improve financial institutions' knowledge of credit applicants and thus allow a better estimation of default probabilities; that is, reduce the adverse selection problem; (ii) strengthen willingness to pay on the part of borrowers, through credit reports, which in turn improves market discipline and tend to discourage debtors over-indebtedness; and (iii) reduce bank monopolistic power and, consequently, improve credit conditions.

Related literature goes back to the seminal contribution by Stiglitz and Weiss (1981) and has regained strength since around 20 years ago, when research papers have turned to study

the advantages of credit bureaus and the empirical evaluation of certain propositions (see in the Box a review of background literature). Going over these works, a first set of remarks can be made: the works refer to corporate debtors, the subject is approached from different angles and they arrive to different conclusions as a result of the diversity of bureau structures. In practice, bureaus are set up under the diverse legal frameworks of different jurisdictions and therefore they can be state-owned or private sector institutions¹⁰, they can carry negative or positive information¹¹, they can keep negative information available for different periods of time and they can allow, or not, the use of the information for activities other than credit granting.

Box: Credit bureaus - Literature

Pagano and Jappelli (1993) show that information sharing reduces the problem of adverse selection and thus default probabilities. In turn, Padilla and Pagano (1997) prove that exchanging information reduces banks' market power on their clients as well as financial institutions extraordinary income. According to Brown, Jappelli and Pagano (2007), exchanging information has improved credit conditions in Eastern Europe countries. Nonetheless, Doblaz-Madrid and Minetti (2009) conclude that while debtors performance tend to improve when lenders agree to exchange information, at the same time, financial institutions tend to grant smaller amount loans, with shorter maturities and require more collateral.

Regarding the evolution of total lending, Pagano and Japelli (1993) find that the increase in lending to safe borrowers may not fully compensate for the reduction in lending to the risky. However, other empirical studies, including Love and Mylenko (2003), Galindo and Miller (2001) and Powell et al. (2004) prove that there is more credit available when there is information sharing between lenders and borrowers.

Padilla and Pagano (2000) and Vercammen (1995) study developed markets and suggest that the strength of default as a negative signal is lessened when payment information and data on debtors' characteristics are shared.

A most recent line of research, also focused on corporate debtors, studies lenders' incentives to invest in collecting and sharing information voluntarily on their potential clientele. The cost of this investment is compensated by the reduction in the probability of granting a loan to a bad client, or to reject a good client, as well as by potentially re-using information and offering financial services to the same client in different occasions.

The option to re-use client data is affected by two developments which have started to be studied: herd behavior by banks and client capturing, or "poaching". Both developments can lead to different problems, such as intensifying banking business cyclicity or systemic risk and over-indebtedness.

In the first case, financial industry managers tend to copy the behavior of their competitors, either because they think that a shared mistake is not as bad as an individual mistake or because they assume that other people's decision contain information. This behavior

¹⁰ According to a survey by the World Bank between 1999 and 2000, 34 out of 61 respondent countries have credit bureaus run by their central bank or banking supervisor. ("World Bank Survey on Public Credit Registry for Central Banks")

¹¹ Negative information bureaus report past defaults on debt services as an indicator to predict future insolvencies. Positive information bureaus are based on the notion that good and bad performances are relevant to predict solvency.

becomes more probable when the costs of collecting and processing information increase or when accumulated information loses explicatory power, for example after a financial crisis.

Client capturing, or poaching, is basically the practice of offering better conditions to competitors' clients that are considered good. This shortens the time horizon of the relationship with the client and thus the relative value of the option to re-use information¹², what in turn discourages investment in information. Consequently, competition between financial institutions and price discrimination are affected¹³.

The incidence of these developments and other characteristics of the market will affect a lender's willingness to disclose proprietary information. The greater the information asymmetry, the more segmented credit markets will be, and the greater clients' mobility, there will be less willingness to share information on the part of lenders. Additionally, there is a branch of the literature that links information sharing incentives to the advantages derived from market discipline¹⁴ and the decisions on information disclosure made by other banks.

Microfinance is also related to these matters, but with a bias towards marginal social segments rather than corporate businesses. In microfinance, the goal is to compensate the lack of collateral with "solidarity groups". Studies on this market have found that credit bureaus may lead to reduced default rates by contributing, among other things, to spot multiple lending¹⁵. But other related studies have also shown concern about clients poaching in the sector: microfinance best clients are more easily seduced by formal lenders', who offer to grant loans faster and with more flexible conditions, thanks to information disclosure in credit bureaus. As a consequence, microfinance institutions provide a positive externality to formal lenders, which in turn puts microfinance business sustainability at risk¹⁶.

Turning to unsecured household lending, credit risk assessment of families is hindered because there is no public information on their solvency or, if there is any, it is incomplete. Given this opacity, the need for a database with inexpensive access and an efficient processing technique of the data is crucial. Additionally, families do not own traditional forms of collateral (other than housing, when they are owners), and therefore an individualized assessment of their solvency is required, the cost of which is too high in terms of the typical loan size. Furthermore, household loan portfolios are usually made up of small loans and many obligors and such an atomization provides an intrinsic diversification of risk, which also discourages individual assessment, while favouring the analysis of systemic factors.

As a consequence, the development of credit scoring techniques, which tend to make the loan decision more automatic, have progressed in parallel with the expansion of bureaus. These techniques are usually based on "hard" information on the individuals supplied by a bureau, principally their loan payment record. Yet bureaus fall short of a complete solution for informational problems. First, data hardly include information on a fundamental variable

¹² See Boot (2000).

¹³ See Gehrig and Stenbacka (2007).

¹⁴ See Van Tassel (2011).

¹⁵ McIntosh and Wydick 2005 develop a theoretical study and Luoto et al. 2007 an empirical work.

¹⁶ Frisancho Robles (2011) studies, for example, how default rates in a microfinance institution in Peru have gone up especially after the introduction of a unilateral information sharing policy whose goal is to reduce multiple loans but indeed has had the opposite effect.

such as income. Additionally, data may not include total debtors' debt, as long as information from certain lenders is not considered, such as stores, supermarkets or even medical centers that finance families. Sometimes, the lack of data is concentrated in geographical areas where a lender has become established and enjoys a degree of monopolistic power on its clients' information.

Following a different research line, the links between financial stability and household indebtedness have gained consideration over the past few years, as a result of the lessons from the latest international financial crisis. This approach contrasts with the traditional point of view, which has viewed families basically as fund providers¹⁷. In this regard, a number of works on unsecured credit to households in the United States can be found in the literature. Their goal is to explain the increase in indebtedness and in the rate of default as from the 80s. These works put forward that certain changes to bankruptcy laws and information technology efficiency could explain those behaviors, and they find that those hypothesis are in general consistent with empirical observations, rather than other hypothesis that put forward a change in the reputational cost of default.

Given that this line of research is closely related to our work, we will summarize the most important elements of these models. To begin with, there are a number of common assumptions: families are originally identical and get an income that is subject to shocks (alternatively, their productivity is subject to shocks), yielding a new level of income which is generally persistent. Then, families' preferences are determined by the expected value of the sum of the discounted utility of consumption. To get this value, models use a unique discount factor and a strictly increasing and concave utility function.

Financial intermediaries offering credit determine loan conditions according to the risk of each debt. Applicants, in turn, can chose only one loan. In equilibrium, competition between intermediaries leads to zero expected profit.

Families may decide to default. Defaulting imposes a "flag" that excludes the family from access to credit for a known or stochastic (depending on the case) period of time and it inflicts on the debtor, as a minimum, a "stigma" cost under the form of a utility loss.

In some aspects these works differ from ours. Just to mention some of them, in general the works cited here assume a unique type of lender, with the exception of Sánchez (2009), who includes two. In some cases, families have assets in which they can save (Sánchez, 2009 and Chatterjee et al., 2007). Narajabad (2012) Livshits et al. (2007) and Athreya (2004) have heterogeneity of defaulting costs, not as an intrinsic feature of the families but rather deriving from the fact that defaulting costs are a fraction of the family's income or the family's future consumption. In Dozd and Nosal (2008) debtors default only if they reach their credit limits, while in other works the debtor can chose default as a strategy, when he or she maximizes utility.

Chatterjee (2007) introduces other idiosyncratic shocks that affect family preferences and family asset holdings (such as divorces or unexpected medical expenses).

Finally, there are models of two periods and models with infinite horizon and there are those of partial equilibrium and those of general equilibrium. When models work with general

¹⁷ For example, BIS (2009).

equilibrium, there is an industry producing a composite good, which uses labour. When models work with medical expenses shocks, there is a healthcare industry.

4. The Model

Our work addresses the subject with an approach that is closer to the last reviewed line of research, since we focus on household credit, but it also takes elements from those works that have studied client poaching and the effects of information reusability. In doing this, we reflect on some typical issues in emerging markets, like low access to banking services. Hence, we deviate from the literature by changing some typical elements, with two goals: (i) allowing the study of clients' entry to the system and the evolution that follows and (ii) allowing the assessment of information sharing on those dynamics, all in a context of credit markets whose characteristics are more representative of less developed jurisdictions.

a) Individuals

Individuals live two periods, from t_0 - the start of the first period - till t_2 , the end of the second period. Following the literature, an individual's income is stochastic in the second period and the new level is persistent. That is, income y is the same for all individuals in $t=0$ (y_0) while y_1 is a stochastic variable that can take on values from a Normal distribution. For individuals, y_1 and y_2 are the same (persistence) but they are not publicly observable.

An individual's consumption is determined by disposable income. If an individual applies for a loan and gets it, their current level of income is increased (reduced) by the funds coming from obtaining (paying back) the loan. The model rules out multiple, concurrent loans¹⁸.

The preferences of an individual are determined, following the usual approach, by the expected value of the sum of discounted utility, using a utility function U that depends basically on consumption with $U' > 0$ and $U'' < 0$. According to these preferences, the individual assesses the advantages from applying for a loan by comparing expected utility under different alternatives.

The model allows for two types of default: the first one is strategic and the second is a result of financial stress. In the first case, an individual decides, in t_1 and in t_2 , whether to default according to their preferences (that is, maximizing the expected value of utility). In the second case, the model assumes that every debtor needs at least 70% of their original income (y_0) to afford current expenses. Hence, if, as a result, the selected strategy, realized income, and payments of principal and interest in the following periods lead to a disposable income below that level, the debtor will default. On this point we coincide with authors such as Chatterjee (2007) in the consideration of a voluntary default (when it is the "best" option) and an unintended default (when it is unavoidable). We also agree with the literature on the assumption that a debtor is excluded from credit after defaulting.

Individuals differ in that they have different valuations of the utility loss deriving from default (the cost of not honoring the debt). We have called this cost b . The time discount factor on consumption (impatience) is also idiosyncratic, and is called β . Both variables (b

¹⁸ Literature, as already mentioned, usually focuses exclusively on loan contracts. According to our model, a loan may only be applied for and obtained at a specific moment in time.

and β) are given for each individual and their values in the population follow a Normal distribution.

It is in the aspects just mentioned that our model diverts from the literature, by introducing certain features that are needed to explain the developments we would like to analyze -that is, the dynamics of debtors' entry to the system and subsequent institution migrations- and to characterize the market in a way that resembles less developed markets more closely. In the first place, families are heterogeneous from the beginning because they have different time discount factors. This feature will allow an explanation for the existence of a portion of individuals that refrains from applying for a loan, that is, they exclude themselves. Second, the cost of default is different among individuals. This heterogeneity is measured by a screening technology and it is, in fact, the strongest argument for the use of such an information technology. In other models, in which families are identical and they only differ in their income as a function of a stochastic shock, information technology has much weaker grounds, as has the punishment following a debtor's default, given that default is a consequence of pure bad luck and therefore does not contain any information on the "type" of individual in question.

b) Financial institutions

There are two types of institutions called, for simplicity, "financial companies" and "banks"¹⁹. Each type offers a unique loan contract, characterized by its amount and interest rate. This contract is announced in t_0 . We call the amount and interest rate offered by financial companies q^f and r^f and the amount and interest rate offered by banks q^b and r^b . In this regard, the model diverts from a standard assumption in the literature, according to which a lender discriminates each debtor by using credit limits and interest rate consistent with each debtor's risk. In contrast, here clients are treated as a pool and they get offered the same loan conditions, thus reflecting more closely the way emerging markets work. Additionally, in our model financial intermediaries do not actively look for new debtors, though they can tempt them to migrate once individuals have payment records. In the literature on US markets, rather, banks are modeled as active searchers for new clients while families, for example, decide whether to take a loan as a result of the offers the households gets, stochastically, by mail.

Financial companies grant loans to every applicant, with the only exception of those individuals who have previously defaulted. Individuals who apply for a loan in t_0 with a financial company get a loan for two periods, amortizing 50% of principal in each installment (i.e., the debtor must pay amortizing principal and interest in t_1 and in t_2). There is no penalty for early amortization of a loan, but this can only take place in t_1 . Individuals can also apply for a loan with a financial company in t_1 and they will get it, unless they have defaulted previously, with maturity of one period, for the same amount q^f and interest rate r^f .

Banks offer a one period loan. They use a screening technology to estimate each debtor's default probability, which has a cost c for each applicant. Using this technology requires that the debtor have a loan paying record. As a result, only those applicants who have had a loan may be approved, and that can only happen in t_1 . Banks will approve a loan application when the estimated default probability is below a cap, as established in their credit policies.

¹⁹ Some cases in literature that consider two types of debtors were mentioned; such debtors are taken exogenously as granted. This paper includes argumentative explanations; however, the model is a given fact.

In the same fashion as financial companies, banks will not grant credit to a debtor who has not honored a payment in the system.

Financial institutions get funding from deposits and capital, at a cost r^d and r^k , respectively. Given that the model is one of partial equilibrium, these rates are exogenous. The level of capital is determined to cover unexpected losses from the portfolio²⁰. Institutions find enough funding to finance approved applications.

c) Individuals' problem

The exercise contemplates six possible strategies; the individual will choose in t_0 , t_1 and t_2 the strategy that maximizes their expected utility.

- 1) *NC*: the individual does not apply for/obtain a loan in any period.
- 2) *FBC*: the individual gets a loan in t_0 from a financial company; in t_1 they get a loan from a bank and with that money they prepay (cancel) their debt with the financial company.
- 3) *FBK*: in t_0 the individual gets a loan from a financial company; in t_1 they get a loan from a bank and keep both loans.
- 4) *FF*: the individual gets loans, in t_0 and in t_1 , both from the financial company.
- 5) *F*: in t_0 , the individual gets a loan from the financial company; in t_1 , they do not apply for/obtain a new loan.
- 6) *NF*: in t_0 , the individual does not apply for a loan; in t_1 , they get a loan from the financial company.

Additionally, those individuals who have got a loan will decide in t_1 and t_2 whether they pay their installments. The following scheme summarizes their decision process:

t_0	t_1	t_2
<ul style="list-style-type: none"> • r^d, r^k, q^f, q^b, r^f and r^b are announced • Individuals get y_0 • Individuals decide whether to take a loan from the financial company • All applicants get a loan from the financial company 	<ul style="list-style-type: none"> • Individuals get y_1 • Debtors decide on their credit strategy, including whether to default Those applying for a second loan with the financial company get it; those applying for a loan from the bank may get it, depending on their score • Payments between debtors and institutions take place 	<ul style="list-style-type: none"> • Individuals get y_2 • Debtors decide whether to default • Payments between debtors and institutions take place

The following table shows the flow of payments, called $z(e)$, from the point of view of the individual and providing there is no default. The + sign indicates an inflow and e represents the strategy:

²⁰ Given that income volatility, together with parameter b , determines default, unexpected losses are estimated as losses recorded over the period when debtors obtain income that is equal to the lowest 5° percentile of the distribution.

Strategy	Table 4.1 Cash flow $z(e)$		
	t_0	t_1	t_2
F	q^f	$-\frac{q^f}{2} - q^f r^f$	$-\frac{q^f}{2}(1+r^f)$
FBC	q^f	$-q^f(1+r^f) + q^b$	$-q^b(1+r^b)$
FBK	q^f	$-\frac{q^f}{2} - q^f r^f + q^b$	$-\frac{q^f}{2}(1+r^f) - q^b(1+r^b)$
FF	q^f	$+\frac{q^f}{2} - q^f r^f$	$-\frac{3}{2}q^f(1+r^f)$
NF		q^f	$-q^f(1+r^f)$

If I_t is an indicator of default that takes the value 1 when the debtor does not pay and the value 0 otherwise, the rule for strategic default in t_1 and t_2 is the following:

$$I_1 = \begin{cases} 1 & \text{if } u(y_1) - b + \frac{Eu(y_2)}{\beta} > u(y_1 + z_1(e^*)) + \frac{Eu(y_2 + z_2(e^*))}{\beta} \\ 0 & \text{otherwise} \end{cases}$$

$$I_2 = \begin{cases} 1 & \text{if } u(y_2) - b > u(y_2 + z_2(e^*)) \\ 0 & \text{otherwise} \end{cases}$$

where $z_t(e^*)$ represents cash flows from the debtor's point of view and is a function of the selected strategy. The asterisk indicates that it is the optimal strategy.

There is a level of income for the selected strategy — $y^*(e)$ — such that the debtor is indifferent between defaulting or not in I_2 . The probability of default is estimated as the probability that the debtor's income is lower than such level of indifference.

Hence, in t_0 individuals make their credit decision by solving:

$$\max_e U = u_0(y_0 + z_0(e)) + \frac{E[u_1(y_1 + z_1(e) - I_1 b)]}{\beta} + E\left[\frac{u_2(y_2 + z_2(e) - I_2 b)}{\beta^2}\right]$$

And in t_1 :

$$\max_e U = u_1(y_1 + z_1(e) - I_1 b) + u_2(y_2 + z_2(e) - I_2 b)$$

$$\text{Subject to } pd(e) < \overline{pd}$$

where

$$pd(e) = \int_{-\infty}^{y^*(e)} f(y)dy$$

and where \overline{pd} is the threshold that the bank uses to approve a loan.

d) The problem of financial institutions

Financial institutions will grant loans as long as their portfolios have a return that covers funding costs (plus screening costs in the case of banks). As in the background literature, the model assumes competition, thus there are no extraordinary profits in equilibrium. There is no difference between the interest rate paid on deposits²¹ by banks and that paid by financial companies, nor in the cost of capital.

Capital is determined so that it covers portfolio losses under a stressed situation. Given that the stochastic factor governing default is the level of income, that extreme loss is estimated as that of a period when debtors get an income equal to the lowest 5% of the distribution of that variable. Capital being determined endogenously and affecting lending rates is new to this type of literature.

- *Financial company:*

The credit portfolio of a financial company has n “new” debtors (those who have just entered the market) and m “old” debtors (those who entered in the previous period). Some debtors in the m group will have defaulted on their debts in t_1 and other debtors, from both the n and the m groups, will default in t_2 .

Debtor i has a probability $pd_1^i(e)$ of defaulting in t_1 , which depends on the idiosyncratic characteristics of the individual, their income and the selected strategy. In the second period, default probability $pd_2^i(e)$ is applied on outstanding loans which are still performing.

A financial company’s inflows are a function of the “age” of the debtors and the strategies debtors have chosen. In each period, inflows from “new” debtors who have chosen strategies *FBK*, *F* or *FF* are the following:

$$\sum_i (1 - pd_1) \left(\frac{q^f}{2} + q^f r^f \right)$$

If the strategy is *FBC*, then the financial company will get:

$$\sum_i (1 - pd_1) q^f (1 + r^f)$$

In each period, inflows from “old” debtors that have chosen strategies *FBK* or *F* are:

$$\sum_i (1 - pd_1)(1 - pd_2) \left(\frac{q^f}{2} + q^f r^f \right)$$

²¹ Due to the existence of deposit insurance.

For the strategy *NF*:

$$\sum_i (1 - pd_2) q^f (1 + r^f)$$

And for the strategy *FF*:

$$\sum_i (1 - pd_1)(1 - pd_2) \left(\frac{3}{2} q^f + q^f r^f \right)$$

The cost of funding the loan portfolio is:

$$(1 - k_f) Q_f r^d + k_f Q_f r^k$$

where Q is the performing part of the portfolio (subscript f indicates financial company) and k is the capital ratio.

- *Bank*

In each period, the bank's inflows are:

$$\sum_i (1 - pd_2^i(e)) H^b r^b$$

The bank's total costs include funding costs plus screening costs c :

$$(1 - k_b) Q_b r^d + k_b Q_b r^k + c$$

5. a. Model solution

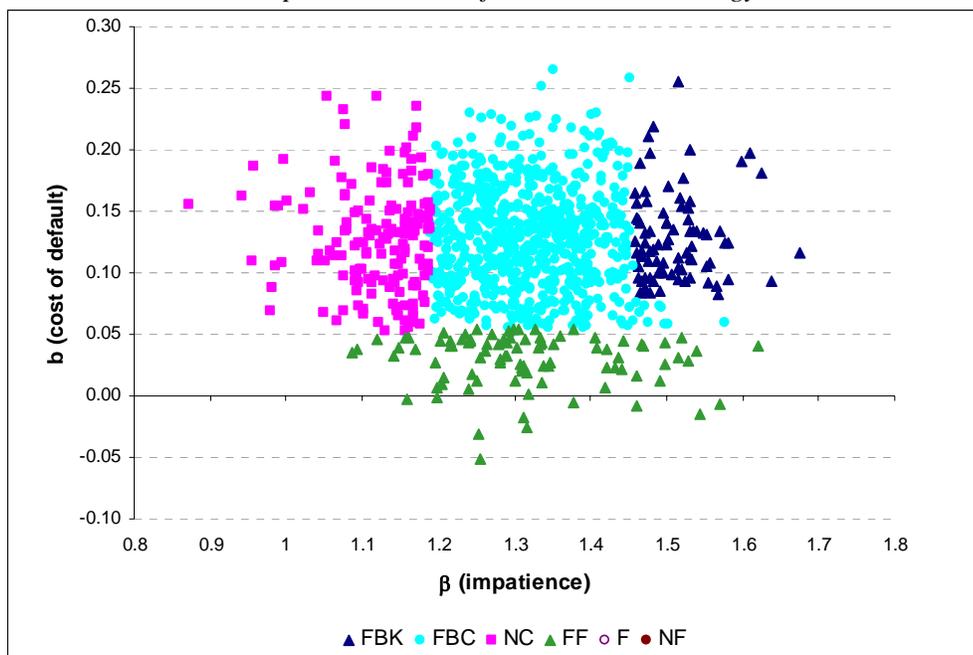
The model is solved using a simulation. A population has been outlined with an average b of 0.12 with volatility (“ σ ”) of 0.05, an average β of 0.30 with a volatility of 0.12 and an initial income of 100 units with a volatility of 5 units. Interest rate on deposits has been set at 3% and required return on capital stands at 10%. Initial values for contract amounts offered by the two types of lenders have been set at 5 units for the financial company and 7.5 units for the bank (this higher value reflects a minimum scale that justifies the monitoring cost faced by the bank). Equilibrium values for the corresponding lending rates are worked out iteratively: 20% for the financial company versus 5% charged by the bank.

Graph 5.1 summarizes the most important results. It can be observed that strategy selection depends on the individual's combination of b and β . On one hand, the individual's β defines the level of debt chosen; when the discount factor β is low (low impatience) the individual tends to avoid debt (self-exclusion) given that earlier consumption will not offset the utility reduction resulting from the following period repayment of the loan (principal and interest). Similarly, for an individual to choose strategy *FBK*, i.e. the option with the highest level of debt, they must have a very high β , given that consumption reduction in t_2 to afford total debt service is significant.

On the other hand, the cost of default generates a threshold beyond which an individual may become a bank client. All the individuals with debt would prefer to cancel with the financial

company and migrate to the bank²², as the bank's interest rate is lower and therefore they would achieve a higher level of consumption with the same level of debt. In that sense, the bank determines who gets a loan. The loan approval process by the bank considers each individual's loan payment record (as reflected by honoring the financial company loan at the end of the first period) as well as the probability of default, which is a function of the potential client's cost of default (their b level). Low levels of b mean that in case of default, the individual's utility would not be much affected; thus this utility loss would tend to be more than offset by the increase in consumption resulting from a loan. In consequence, the bank rejects individual with low levels of b , leaving the financial company as the only choice for these people.

Graph 5.1: Choice of indebtedness strategy



Amounts and interest rates prove to be equilibrium levels as neither banks nor financial companies get extraordinary profits (income covers funding costs, including capital). Financial companies charge a higher interest rate as a reflection of the higher risk of their portfolios, which affects the business through two channels: first, financial companies will only collect funds on the performing part of their portfolio, and second, financial companies have to pay for a funding that is more expensive on average, because they must work with a higher proportion of capital to cover higher unexpected losses. Moreover, financial companies have to consider the potential loss of good clients, who may migrate to banks in t_1 . We turn now to analyze the impact of the latter.

In fact, it is a goal of this work to analyze what happens when the possibility to offer better credit conditions to other institutions' debtors is made easier. Within the exercise, this possibility is introduced by shortening the time period between t_1 and t_0 . Table 5.1 summarizes the changes in the main variables of the exercise, in equilibrium, when the point of time when the debtor can decide a change of creditor is altered.

²² There might be other cases if the difference in contract amounts of both types of institution were higher. That is to say, there might be cases in which the fixed amount of the loan granted by the bank is higher than the amount intended by the individual.

Table 5.1: Effect of early debtor “poaching”

Time to migrate (as % of t_i)	% indebted population	Strategy options (% by # of borrowers)					Interest rate		Population w/o credit	
		F	FF	NF	FBK	FBC	Nonbank	Bank	self-excluded	rejected
100%	75.6%	0.0%	10.3%	0.0%	6.6%	83.1%	20.0%	5.0%	7.6%	16.8%
90%	73.6%	0.0%	10.6%	0.0%	6.5%	82.9%	22.5%	5.0%	9.4%	17.0%
70%	71.6%	0.0%	10.6%	0.0%	3.6%	85.8%	28.5%	5.0%	11.2%	17.2%
50%	68.8%	0.0%	10.5%	0.0%	0.6%	89.0%	39.5%	5.0%	13.4%	17.8%

Early debtor capturing changes financial companies’ cash flows and their balance sheets. First, financial companies lose income as good debtors migrate in the second period; hence, these companies will try to offset such expected loss of income with higher initial interest rates on their loans. Given that financial companies are the entry door to the credit system, debtor poaching raises the cost to enter the system and, consequently, tends to increase the overall default rate. Second, when clients make early payments on their loans, the business of financial companies is downsized (assets fall as well as liabilities).

As for banks, their interest rate is hardly changed if they do not change the cut-off level associated to the estimated probability of default used for loan approval, given that lending interest rates are linked to that threshold. However, as long as the cost of entry to the system goes up, the portfolio risk rises, and therefore, a higher number of applicants will be turned down by banks. Such applicants’ only choice to obtain a second loan –provided they want such a loan to increase their expected utility- is through a financial company.

Regarding individuals, the number of those being granted a loan will be reduced as a result of an increase in the cost of entry (self-exclusion goes up) and a rise in the proportion of applicants turned down by banks’ (which curtails the possibility of exchanging more expensive debt for cheaper debt). On the other hand, the possibility of migrating earlier to a loan with better conditions encourages entry, especially for those individuals who would refrain from applying for a loan in the previous situation²³.

Comparison of final loan costs, with and without early migration, is uncertain for individuals who have access to bank credit. In cases of *early migration*, individuals must pay a higher interest rate to financial companies, but they will do so for a shorter period of time as compared to the original situation. Besides, the fact that financial companies charge higher interest rates renders the use of *FBK* strategy (which brings out the highest level of individual indebtedness) more unlikely to be used, as the interest rate gap between banks and financial companies is applied for a longer period and thus incentives to cancel the first loan are stronger.

Conclusions up to this point are interesting: the results challenge the broadly accepted notion that sharing information on debtors’ willingness/ability to pay reduces the problem of adverse selection and thus has a positive effect on credit markets. The problem of client poaching — which increases the costs of entering the credit market — may offset, at least partially, gains obtained from better information.

A further issue may be analyzed within the model, concerning the effects of the financial company carrying out some sort of screening on applicants. Of course, this could not be

²³ A utility analysis for individuals would imply a more in-depth study of parameters included in this function and that fall outside the scope of this paper..

based on loan payment records, but rather on other variables that could be used as proxies of willingness/ability to repay²⁴.

To develop this idea, the exercise has been modified to consider financial companies' carrying out a simple screening (less sophisticated than that of banks), which allows them to reject the riskiest 5% of applicants at a negligible cost. Under the original assumptions, when creditor migration can take place at the original t_l , financial companies' applying a simple screening significantly reduces the cost of entry to the credit market and raises the percentage of individuals having access to credit (see Table 5.2). Moreover, within the segment of the population that does not get a loan, applicants who were turned down represent a higher portion while the portion of self-excluded individuals goes down significantly.

Table 5.2: Effect of financial company's "screening"

Time to migrate (as % of t_l)	Screening by Nonbank	% indebted population	Strategy options (% by # of borrowers)					Interest rate		Population w/o credit	
			F	FF	NF	FBK	FBC	Nonbank	Bank	self-excluded	rejected
100%	No	75.6%	0.0%	10.3%	0.0%	6.6%	83.1%	20.0%	5.0%	7.6%	16.8%
100%	Yes	84.0%	0.0%	4.3%	0.0%	27.6%	68.1%	10.0%	5.3%	5.8%	10.2%

On the other hand, in this modified version of the exercise, there is an increase in the number of debtors choosing *FBK* strategy (this strategy grows from representing around 7% of total debtors to 28%), i.e. there are more debtors who get a loan from the financial company and the bank and keep both. This means that the average level of indebtedness is going up, which in turn increases the probability of default of the bank's portfolio. In these circumstances, banks' lending rate goes up slightly (see Table 5.2)²⁵.

Additionally, the model shows that the amount of credit and the portion of the population with credit depend on the distribution of b and β (positively on their respective medias and negatively on their respective standard deviations), on the probability distribution of income (same as before) and on the amount of the loans (negatively). They also depend positively on the quality of the screening technology, while uncertainty prevails with respect to the risk threshold set by the bank.

b. Empirical contrast in Argentina

We have worked with a database containing the history of non-financial private sector consumer debtors as informed by financial institutions to the credit registry run by the Central Bank of Argentina, during the July 2002 - September 2010 period (reporting institutions include banks, financial companies, credit card issuing companies and financial trusts)²⁶. Our goal is to contrast the data against the model's pre-requisites of Section 4,

²⁴ In some countries, credit assessments take into account potential debtors' payment record in terms of rent, and utilities payments as well as expenses pattern, etc.

²⁵ Changes to the migration period do not significantly modify the portfolio's non-performance of a bank or a financial company with the parameter values used to solve the model. In these cases, the financial companies' interest rate increases due to the loss of good debtors rather than a rise in bad debtors

²⁶ The Credit Registry is a public database created in 1991. It provides detailed information on each debtor for every reporting financial institution (financial institutions governed by the Law on Financial Institutions, credit card issuing companies, and financial trusts). Current consumer loans are classified into five specific categories based on the number of days in arrears according to the BCRA's regulations. The BCRA informs, on its website, data corresponding to the last month. Records may be consulted individually and data are updated monthly with 3-month delay.

such as the existence of different types of financial intermediaries according to their inclination to welcome new clients and the existence of debtors' poaching. We have not been able to contrast the effects of making debtor poaching easier, because there has not been a policy change, or event, so as to isolate that effect. Unfortunately, we have not been able to assess self-exclusion or rejects, either, because there is no information on those.

The number of clients and the amount of loans were calculated on a monthly basis and for every institution for the following segments:

- a. *New debtors in the institution*: Those debtors registered with an institution, who have no record with the same creditor in the previous 12 months²⁷. This group, in turn, has been sub-divided into:
 - a) *Debtors with a short record in the system*: Including debtors who are reported as having a loan with another institution in 6 or less months out of the last 12 months.
 - b) *Debtors with a long record*: Including debtors who are reported as having a loan with another institution in at least 7 months out of the previous 12.
 - c) *Debtors who are new in the system*: Those debtors who have had no loan record in any institution for the previous 12 months.
- b. *Debtors with a record in the institution*.

Data were also collected regarding the institutions that had been previously granting credit to debtors in the group of *New debtors in the institution with a short record in the system*.

It is worth pointing out that people under the definition of *New debtors in the system* do not necessarily imply individuals who do not use banking services; it simply refers to the fact that they did not have any loan with an institution reporting to the Central Bank Credit Registry but who may have deposits with institutions supervised by the BCRA or loans from a non-regulated creditor.

The break-down of the group *New debtors in the institution* aims at allowing the study of debtor migration, or poaching, especially of those debtors who entered the system only a short time before. A period of 6 months has been reckoned reasonable to infer the debtor's "willingness to pay", considering that terms for domestic loans are very short.

During the period 2005-2010²⁸, lending institutions reporting to the Credit Registry granted loans to around 350 thousand people a month who were new debtors in the institution. Around 40% of them corresponded to new debtors in the system, with a decreasing trend along the period. The percentage of debtors who were new in the institutions and had a long record in another institution went from 45% at the beginning of the period to around 60% by the end of 2010. The rest is accounted for new debtors in the institution with a short record in another institution (see Graph 5.2).

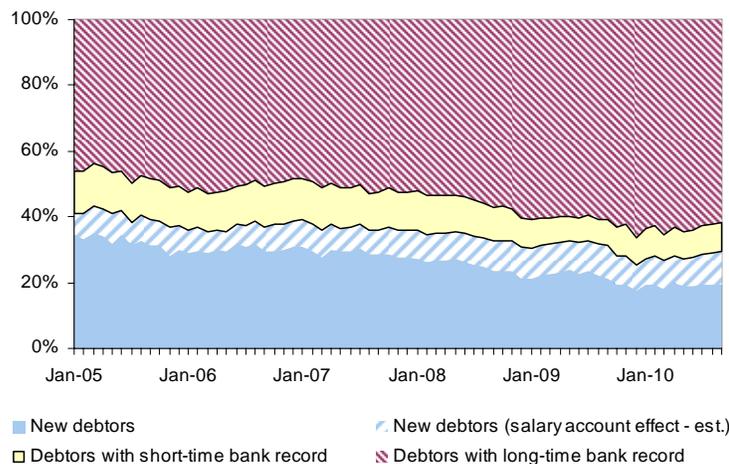
The high percentage of inclusions to the system may be explained by considering two factors: (i) As from 2004, a process of recovery of aggregate credit and incorporation of new debtors took place, following the 2002 debacle; in this context, a subsequent deceleration in the rate of inclusions of new debtors into the system is also to be expected,

²⁷ The Argentine Credit Registry records good and bad information. Having a record in this context does not necessarily mean having a record of arrears or default but rather having a loan.

²⁸ Previous data were discarded for being highly affected by the aftermath of the 2001-2002 crisis.

which went down to 29% by September 2010. (ii) Within the percentage of new debtors in an institution, there is a group of people who have a “passive” link with the lending institution (e.g. by holding an account or having salaries deposited therein) so that the bank has some information on them and can apply mechanisms to control risk. We have estimated that more than 8% of clients being granted a loan (10% by September 2010)^{29 30} had this type of relationship.

Graph 5.2: Breakdown of new debtors in regulated institutions

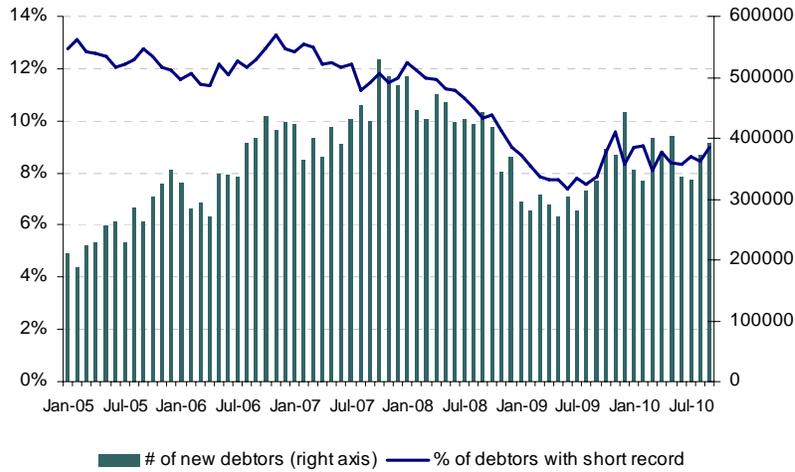


As regards new debtors in regulated institutions with a short record, the group accounted for a high percentage of the total when the amount of individuals with consumer loans is going up, while both variables tended to go down in tandem (Graph 5.3).

²⁹ This estimate is explained further below.

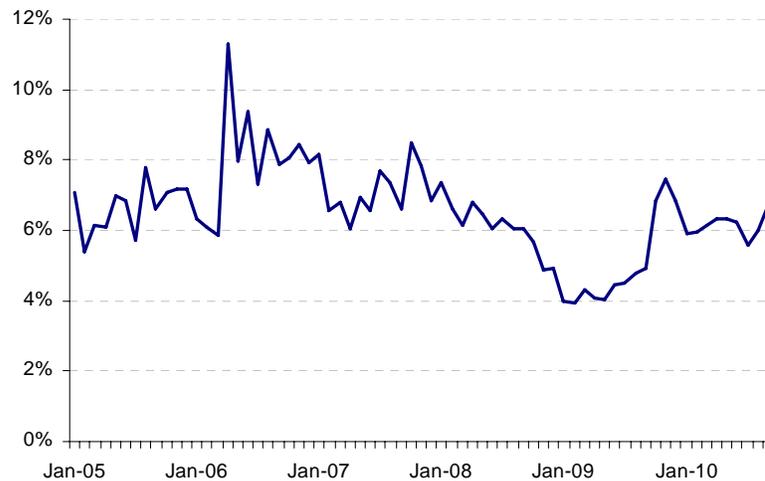
³⁰ In Argentina, the “salary account” and the “discount code” systems provide banks and other financial institutions with privileged information to estimate total income and the financial situation of their holders, turning into a platform to issue new loans. In addition, the credit method with automatic debit clause of installments in bank accounts is widespread. The first system dates back to, 1997 and makes reference to the obligation affecting all companies (since 2001; before 2001, it affected companies with over 100 workers) whereby salaries were to be deposited in bank accounts. The discount code system is a program dating back to 1995 for mutuals and to 2006 for some banks; with this code, institutions are allowed to grant loans to beneficiaries of the pension system with automatic debiting of installments from their accounts.

Graph 5.3: Evolution of clients with a short record



Finally, figures are consistent with a significant level of debtor “poaching” as, on average, 6.5% of debtors having entered the system in the previous 6 months quickly got a loan in a second institution. This percentage shows variability along the period and, in particular, it shows a fall around the end of 2008 and the beginning of 2009 (see Graph 5.4), when there was an abrupt drop in aggregate economic activity.

Graph 5.4: Evolution of clients that swiftly obtained a loan in another institution



The fact that some debtors got a second loan shortly after they had got their first loan in the system can have two drivers, according to who is the active part, applicants or creditors. This process may be an indicator of the existence of independent phenomena or not. In the first case, an applicant searches for a loan from several institutions and gets it almost simultaneously in at least two of them. The second institution granting a loan will know about the existence of the first loan only if there has been enough time for the information to be reflected on the databases. In the second case, the second institution actively offers a loan to this type of clients, i.e., to those who have recently entered the system and show regular payments.

Whichever the case, the first institution is negatively affected by the second loan given that either the debtor becomes more indebted than they were when the first loan was granted, or the debtor pays off the first loan as they now have one with better conditions, imposing an opportunity cost on the first institution in terms of the interest payments it will not collect (strategies FBK or FBC respectively). Only when both institutions are part of a financial group and the first creditor is passing information to the second one, there might be no losses for the first institution if a consolidated approach to profitability for the group is adopted.

c. Groups of financial institutions

Turning to the types of creditors, and in particular those lending to households, an interesting issue is the widespread existence of specialized retail institutions that are more inclined to accept debtors with weaker track records. Strangely, when looking into the reasons for these developments, there is hardly any academic literature to be found, but rather some anecdotic explanations referring to regulatory, reputation and business incentives. In effect, while there is extensive literature on the especial role of banks in dealing with debtors with information problems, it refers in general to commercial credit³¹ and only exceptionally to household credit.

A basic explanation for the existence of specialized retail institutions brings up psychological factors that may make an applicant with a weaker or no track record approach institutions with less imposing structures or more informal style. This can be the case with financial companies, as they usually set up less solemn access points in locations with lower income populations.

As far as regulatory factors are concerned, the stress is on the fact that some financial companies are frequently unregulated as a result of their not accepting deposits (although some of them are legally allowed to). While some financial companies may not be subject to solvency and liquidity prudential regulations (among others, such as premises safety standards), regulated banks must comply with a series of norms, such as non performing loans allowance rules, that impact on their capital and profitability. Additionally, labor laws and union agreement conditions for companies' employees may be different from those for banks' employees.

Other explanations point to the links between the name of a financial institution and its ability to keep a reputation of patience and sympathy towards its clients who are going through difficulties. These arguments suggest that banks are perceived as more tolerant than financial companies, so it is in their interest to take care that this reputation is maintained. This line of argument has not been systemically proved, but rather supported by some anecdotic backing³².

Apparently, some of these reasons must be valid, as it is normal to see legal institutions specializing in the retail business, that are subsidiaries of banking groups but keep an independent commercial image, while the activities of these retail institutions are not banned for the commercial bank. Similarly, sometimes a retail specialized financial institution becomes part of a financial group as a result of its acquisition by a bank and it retains a separate commercial identity, also as a way to keep its reputation in the market as a

³¹ See Fama (1985), James (1987) or Nakamura (1991).

³² See Carey, Post and Sharpe (1998).

specialist in certain businesses, such as leasing or car loans. There are other financial companies which are controlled by non-financial corporations, such as car groups. In these cases, profitability goals may be defined at a group level; building the relationship with the client is relativized as it is related to the possibility of cross-selling products offered by other members of the group.

The model assumes there are two types of institutions: banks and financial institutions. Each of them is characterized by the mechanism to select clients: financial institutions grant loans to clients with higher risks given that they do not require specific information; banks, in contrast, assess the applicant's risk and set a ceiling on accepted risk. The higher expected risk in terms of financial institutions is covered by the lending interest rate, while the unexpected risk is covered by capital, which also impacts on the lending interest rate due to the fact that funding with capital is more expensive than funding with deposits. The following section contrasts these assumptions with the data.

Our database includes data from institutions reporting to the Argentine Credit Registry, namely banks, regulated financial companies, credit card issuers and financial trusts. This universe does not include the most stereotypical first resort lenders such as mutuals, informal companies and retailers. Thus, if the assumptions of the model regarding different types of lenders can be verified with this data, it will be a good result considering that we will be working with a universe of institutions comprehending a set of companies that are more homogeneous, *a priori*, than desirable.

In particular, we will check if there are institutions which are systematically more inclined to grant loans to clients with no credit record ("*open institutions*"), if there is a set of institutions which systematically capture new clients from other institutions ("*poachers*") and if there is another group whose "new" clients are systematically captured by other institutions ("*institutions who lose clients*"). These categories are not mutually exclusive, as there may be institutions that meet the conditions to be included in more than one group. Additionally, for an institution to be classified in one of those sets, it must meet the conditions corresponding to the category consistently along the period (some institutions show what seem to be strategy migrations in one or more occasions between 2005 and 2010, or during the time they remained in business).

In order to assess the inclination to incorporate new clients, an indicator has been defined as the ratio *New debtors in the institution who are new in the system / New debtors in the institution*. The ratio is then modified according to two factors: (i) portfolio growth during the period; i.e., if two institutions have the same ratio but one of them shows a 100% portfolio growth and the second institution shows a 10% growth, then the first is more inclined to incorporate new clients as incremental risk is higher in terms of its original portfolio, and (ii) the portion of new clients' loans that may arise from the client's having a deposit with the institution (which has been estimated using a panel data technique on deposits accounts, in particular those in which salaries are deposited).

To assess "poachers" the ratio *New debtors in the institution with short record in the system / New debtors in the institution* has been used. This ratio was compared to the one arising from the system average in each month. If it is verified that the former is greater than the latter with a 95% statistical confidence limit, then the institution is considered a poacher.

For institutions to be classified as "institutions who lose clients", the portion of its recently incorporated debtors who get a second loan is compared to the portion that would be

obtained completely at random (considering the number of new clients that are getting a second credit in the whole system). The observed portion must be greater than the theoretical one (at random) with a 95% confidence.

Table 5.3 shows that out of 142 creditors analyzed, 35% of them have come out as poachers and 31% are highly inclined to grant credit to clients who are new in the system. Additionally, nearly 50% of the institutions have emerged as “institutions who lose clients”, i.e., the portion of their clients that have received a second loan in the six months following their first loan is higher than the portion that would emerge randomly. It is noteworthy that all classifications (poachers, institutions who lose clients and open institutions) have a higher share within the group of non-bank financial institutions (NBFIs) (i.e. financial companies and credit card issuers).

The sub-group of credit card issuers shows the highest number of open institutions, while state owned banks emerge as the least prone to incorporate new clients. Financial companies’ clients come out as the most poached ones, followed by those of credit card issuers and foreign banks. State owned banks’ clients are the least likely to get a second loan shortly after the first one. Financial companies and credit card issuers are the groups that poach more clients, generally belonging to such institutions. Among banks, foreign banks are those who poach the most (see Table 5.3).

Table 5.3: Classification of institutions

	# entities	Type of credit institution					
		Poacher		Loser		Open	
		#	in %	#	in %	#	in %
Lender	142	49	34.5	69	48.6	44	31.0
Banks	50	8	16.0	13	26.0	10	20.0
State-owner	13	1	7.7	0	0.0	1	7.7
Domestic private	25	4	16.0	8	32.0	5	20.0
Foreign	12	3	25.0	5	41.7	4	33.3
Nonbanks	92	41	44.6	56	60.9	34	37.0
Financial companies	11	6	54.5	8	72.7	4	36.4
Credit cards issuers	81	35	43.2	48	59.3	30	37.0

At this point, it is interesting to turn to analyze the existence of relationships between institutions that belong to financial groups. Institutions have been classified into (i) parents (institutions that own a controlling stake in another – retail- institution), (ii) subsidiaries / related firms (institutions whose stock is owned, at least partially, by another financial or non-financial institution, including credit cards issued by cooperatives, mutuals, or local companies that have their brand but who have access to a national network), and (iii) the rest. If an institution may classify as “parent” and “subsidiary / related”, then it has been classified into the second sub-group.

It can be seen, as the figures in Table 5.4 show, that (i) in general, poachers are also institutions who lose clients (44 institutions) and (ii) those institutions that are subsidiaries of, or related to a financial retail group, are more prone to poach and lose clients with a short loan record. Specifically, out of 63 institutions in this group, 32 are poachers and 41 are institutions who lose clients, and they account for 28% and 31% of the household credit market, respectively, as measured by the number of clients in the segment.

Open institutions account for only 17.6% of the number of clients, while they make up 31% of the number of institutions (0.4% of share in total clients in the case of open institutions on average), indicating that these entities have an average size that is below the average.

Nonetheless, this group shows the highest growth rate in the period as for the number of clients.

Around 50% of open institutions are also institutions who lose clients. There are 3 open banks which are related to an economic group and they are all institutions who lose clients and out of 21 open, related, NBFIs, 13 are institutions who lose clients. These figures are consistent with the strategy followed by some economic groups, which comprise a specialized retail firm that offers loans to people with no credit record so as to attract them as clients of other firms of the group, once the individuals start to show good ability and willingness to pay.

Table 5.4: Classification according to institutions' relationships

	# entities	# entities			Participation (by # of debtors)			Annual change (average)		
		parent bank	controlled/ associated	others	parent bank	controlled/ associated	others	parent bank	controlled/ associated	others
Lender	142	11	63	68	27.7	37.6	34.7	25.2	25.9	19.5
Bank	50	11	11	28	27.7	9.1	30.0	25.2	18.6	19.9
Nonbank	92	0	52	40	0.0	28.4	4.7	0.0	28.3	16.6
Poacher	49	0	32	17	0.0	27.5	6.6	0.0	20.4	10.7
Bank	8	0	5	3	0.0	4.1	3.7	0.0	20.6	10.8
Nonbank	41	0	27	14	0.0	23.4	2.8	0.0	20.4	10.7
Loser	69	3	41	25	8.3	31.0	5.3	13.2	20.5	10.2
Bank	13	3	6	4	8.3	5.5	2.0	13.2	20.6	4.6
Nonbank	56	0	35	21	0.0	25.5	3.3	0.0	20.4	13.6
Open	44	1	24	19	1.4	13.4	2.8	88.2	37.6	22.4
Bank	10	1	3	6	1.4	3.8	1.5	88.2	20.9	31.8
Nonbank	34	0	21	13	0.0	9.6	1.3	0.0	44.2	11.7
Poacher and Loser	44	0	29	15	0.0	27.4	4.3	0.0	20.5	7.6
Bank	6	0	4	2	0.0	3.9	1.8	0.0	20.9	4.1
Nonbank	38	0	25	13	0.0	23.4	2.5	0.0	20.4	10.1
Open and Loser	22	0	16	6	0.0	11.9	1.0	0.0	24.3	21.1
Bank	4	0	3	1	0.0	3.8	0.1	0.0	20.9	9.6
Nonbank	18	0	13	5	0.0	8.1	0.9	0.0	25.8	22.9

d. Strategies and loan conditions

The model introduced in Section 4 assumes that the different strategies to take on new clients followed by the two types of credit institutions are associated with different loan conditions. To empirically contrast this idea, we have analyzed granted amounts, charged interest rates for credit card and terms to maturity for retail loans³³. An index has been created for amounts and interest rates, with monthly figures that indicate the gap between each institution's data and the average for all the institutions.

Table 5.5 compares the data for open institutions against the rest, and the data for institutions who lose clients against all others.

Table 5.5: Loan Conditions

	Statistical						Probability Ho: equal distributions
	# obs	Mean	σ desviatio n	# obs	Mean	σ desviatio n	
	Open			Others			
Maturity (months)	14	45.7	9.8	42	50.1	11.0	0.0707
Amount (size versus average for the system as a whole)	40	0.5	0.5	93	1.2	3.2	0.0434
Interest rate (bp versus average for the system as a whole)	39	2.5	6.4	91	-0.9	6.8	0.0010
Non-performing loans (in %)	40	31.2	34.4	93	14.2	18.8	0.0041
	Loser			Others			
Maturity (months)	20	44.2	12.8	36	51.7	8.5	0.0385
Amount (size versus average for the system as a whole)	67	0.5	0.5	66	1.5	3.7	0.0052
Interest rate (bp versus average for the system as a whole)	66	3.1	7.1	64	-2.9	5.0	0.0000
Non-performing loans (in %)	67	25.9	27.5	66	12.6	21.9	0.0000

During 2005-2010, “open” institutions granted, on average, 46 month maturity loans, for an amount that was half the average for the system as a whole and at a rate that was 2.5 percentage points higher than the average rate for the system during the period. In turn, loans from other institutions (not open) showed better conditions: maturity of 50 months, an average amount that was 1.2 times that of the system and an average charged rate that was 1 p.p. below the corresponding average. Specifically, by the end of 2010, open institutions granted loans that on average were for \$2,100, and charged 38% as interest rate, while the rest of the institutions were lending on average \$5,350 and charging 33% as interest.

To prove if these differences are statistically significant, the non-parametric Mann Whitney U test has been used, with a 95% confidence level. Results show that institutions focused on people with no loan record grant smaller loans at higher interest rates. At the mentioned tolerance level, differences in maturity are not significant³⁴. In addition, these institutions

³³ For the amount variable, the average size of loans granted to individuals who enter the system was used— data on the average amount granted in relation to the whole portfolio to individuals was also used and results were similar—; the interest rate used is the average between interest rates charged for credit cards to individuals in the case of banks and financial companies and the one provided by a specific information system for credit card issuing companies. Finally, in the case of the “term” variable, information arising from the Transparency Regime for personal loans was used.

³⁴ It should be taken into account that this information is only available for some banks and financial companies..

show a higher level of credit risk as reflected in their non-performing portfolio. The hypothesis of equal distributions is rejected in the cases of loan amount, interest rate and percentage of non-performing portfolio³⁵.

In turn, loan conditions are also less convenient in institutions whose clients are poached by other institutions before six months have elapsed from the time they obtained the first loan, as compared to those granted by institutions that are not “institutions who lose clients”.

6. Conclusions

There is a positive correlation between financial deepening and economic development. As a result of that evidence, there has been a stimulating debate on policies that may facilitate household access to financial services, especially access to finance. The issue is a matter of particular concern in less developed markets, where access to banking services is low.

In the beginning, research and policies were focused on the positive effects of gathering and distributing information on loan payment record to improve market efficiency. In consequence, the creation of risk bureaus was given a huge boost. In fact, many studies have found a negative correlation between information availability and credit risk, but in general they have worked with the average population rather than with specific segments of individuals.

As regards the consumer lending segment, which is particularly opaque, access to finance is especially difficult for those individuals who cannot show a good loan payment record or do not have any record at all. Still, some lending institutions can be found which are relatively more inclined to incorporate new clients to the system. These institutions' profitability can be impacted by making their novice clients' information available to other institutions, what makes the poaching of these clients easier and pushes the original institutions to raise their lending rates, in the end negatively affecting new clients' access to the consumer credit market. This development is also a conclusion of the model, the assumptions of which have been corroborated for the Argentine market in the 2005-2010 period. In effect, more “open” credit institutions show less convenient loan conditions as compared to those of other institutions, in terms of amount and interest rate. Additionally, most “open” institutions fall prey to the poaching of their clients (or may transfer their clients to other members of their group if they are related firms). These institutions that tend to accept new clients more easily, in the case of the Argentine market under review, are smaller than the rest and show higher credit risk portfolios, while they also present the highest growth rates in terms of the number of clients.

Finally, this paper underscores the importance of searching for mechanisms to allow for the estimation of willingness and ability to pay in relation to people with no payment record.. When adverse selection is a serious issue and the interest rates charged on loans to people entering the credit market are very high, there is a significant segment of individuals who exclude themselves from the loan market as a result of the elevated cost of credit, but they do have good creditworthiness, which should be estimated using appropriate mechanisms. Therefore, there may be much to gain if their risk could be estimated appropriately. In view of this, this paper's recommendations point to improving the availability of information other than loan payment record and to developing processing technologies that may not

³⁵ Using the non-parametric Mann Whitney U test, with a 95% confidence level..

impose important expenses to the creditor (specially bearing in mind that the institutions more inclined to incorporate new clients to the system are usually small). There could be an important positive impact on access to financial services from the creation of databases of public use—under a legal framework that prevents a bad use of this information—which may allow for the univocal identification of individuals, their family setting, geographical location and willingness to pay as measured from their honoring of different duties (such as housing rent and utilities payments). Domestically, partly as a result of the lack of systematic databases, screening mechanisms have tended to focus on a person's payment record to estimate their credit risk and ability to pay. In that respect, salary accounts—which allow for a good estimation of an individual's payment capacity—have reflected the kind of policy that we think should be followed. However, these accounts are not used by people who do not have a formal working relationship (such as informal workers or self-employed people) and still may have a low level of credit risk.

An alternative, or complement, to the proposals in the previous paragraph, at least as a first thought, could be promoting a monopolist use of novice clients' data. However, we would not support such a proposition given the negative consequences that it may have on welfare. In effect, such a scheme would deprive novice debtors from the possibility to find better loan conditions and thus it may hinder competition, all of which will render the evaluation of counterbalancing positive and negative effects more difficult in that case.

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