

**Information and debt decision making:
the case of the Italian consumer credit reform**

Umberto Filotto – Università di Roma “Tor Vergata”, u.filotto@assofin.it

Caterina Lucarelli – Università Politecnica delle Marche, c.lucarelli@univpm.it

Nicoletta Marinelli – Università di Macerata, nicoletta.marinelli@unimc.it

Abstract

Irrational debt decisions at the individual level may be detrimental for collective welfare and systemic stability. This risk explains the commitment of regulators, internationally, to foster sound individual debt decision-making. We analyse the Italian case study offered by the Legislative Decree 141/2010 that reformed the consumer credit market adopting European Directive 2008/48/EC. Enforcement of this law represents an exogenous shock to empirically test, with diff-in-diff estimator, the impact of mandatory information acquisition, jointly asked to lenders and borrowers. By using unique data on credit consumer borrowers received by the most relevant Italian Credit Bureau (CRIF), our findings support that, in the medium term, the new consumer credit regulation has improved borrowers' repayment ability, enhancing the quality of credit distribution. Nevertheless, a simplistic 'better information-better behaviour' relationship cannot be assured. This success is likely due to conjunct adaptation of behaviours, as well as shared responsibilities, experienced on both the demand and offer side of the consumer credit marketplace.

JEL: G21; G4

Key-words: consumer credit; credit register; repayment ability; behavioural biases; information sharing

Introduction

Wise and informed individual decision-making is a pillar for collective well-being. Individual mistakes, especially in economic and financial domains, may propagate severe effects on common welfare. Comprehension of behaviours at the individual level is a priority, not only for academics, but also for policy interventions, in order to avert transmission of damages from inadequate personal choices to the health of the overall community.

Consumer loans are particularly vulnerable to market failures as suggested by statistics on the rise of personal bankruptcies in the consumer debt market (Livshits, 2015). Literature indicates that unsound debt decisions may be related to a set of psychological biases: distorted perception of 'time' (Thaler, 1981; Meier and Sprenger, 2010; Stango and Zinman, 2009), unrealistically optimistic attitude (Seaward and Kemp, 2000; Ausubel, 1991), inability to resist pressure and temptations (Cameron and Golby, 1990; Gathergood, 2012), or framing effects induced by debt disclosure or advertising (Bertrand et al., 2005; Bertrand et al., 2010). Drawbacks in debt decision making may be caused also by lack of financial literacy (among the others, Lusardi and Mitchell, 2011; Disney and Gathergood, 2013), or intrinsic cognitive limitations (Caratelli, Filotto, Mattarocci and Viale, 2015; Gathergood, 2012; Bajo and Barbi, 2015). These findings suggest that individual mistakes and psychological biases can lead consumers to overborrow relative to an unbiased benchmark.

Policy-makers are increasingly sensitive to the findings derived from applying behavioural finance to the study of household financial wellbeing (Mester, 2015). Regulators in the United States, in the European Union and in Italy have addressed the issue of borrowing in the consumer credit market to educate individuals and to guide/shape behaviours at the micro-economic level. However, whether remedies are needed to address these biases and what remedies would be effective is still an open question. Indeed, the statutory protection of common interest and well-being by setting constraints on personal debt decisions should not violate the individual freedom to choose; therefore, it is questionable whether severe laws in consumer protection are, in fact, successful and effective. Doubts intensify as empirical research proves that restrictions to the access to consumer credit cause damages to consumers on average, rather than helping them (Zinman 2010).

In this paper, we analyse unique panel data on 60,000 Italian consumer credit borrowers received by the most relevant Italian Credit Bureau (CRIF). This dataset covers seven years (2009-2015) and contain information on individual consumer debt applications and exposures. Information are also available on the overall debt position and on the terms of repayment. During this period, a new consumer credit law (Legislative Decree N. 141 of 13th August) became effective in Italy as enforcement of the European Directive 2008/48/EC. 2010. Its key element for our purpose is that the new law has not enacted restrictions on consumer credit loans; conversely, it has leveraged on the enhancement of information on both sides of the market, by strengthening pre-contractual information, on the one hand and by introducing mandatory creditworthiness assessment, on the other hand. Some papers underline the importance of asymmetric information on consumer credit markets at theoretical and empirical level (de Janvry et al., 2010; Dobbie and Skiba, 2013). Therefore, the introduction of this reform represents a structural shock to test, with a diff-in-diff estimator, if enhanced information requested by regulation may weaken asymmetries in consumer credit market, reduce adverse selection and moral hazard, and improve credit allocation (Dobbie and Skiba, 2013). If enhanced information had been able to stimulate widespread, responsible borrowing and lending, we might expect after 2011 an improvement in credit allocation. If instead the new legislation resulted to have no effect in lenders' and borrowers' behaviours, then we should observe no improvement across time. Our findings suggest that our proxies of repayment capacity have improved after the enactment of the law. In light of the new information obligation introduced by law, and given that we control some individual characteristics, our results suggest that a mandatory informative marketplace enhances the quality of credit distribution and benefits borrowers' repayment capacity. Prominent works on relationship banking have underlined the importance of long-term commitment in the bank-customer relationship and the likely strategic interactions between a credit supplier and its established customers (see, among others, Elyasiani and Goldberg, 2004; Mayer, 1988). As an alternative explanation, it is possible that the length of relationships between the lender and the borrower have affected the results. However, we do not find prima facie evidence that the presence of an already existing relationship have affected the findings: no remarkable difference are observed when we compared the subsample of "old" versus "new" clients.

As a complement to our results, we also analyze cross-section microdata provided by CRIF on two cohorts of individuals, each made up of 60,000 customers, one year before the enactment of the law (September 2009, pre-law cohort) and one year after the enactment of the law (September 2011, post-law cohort). By analyzing final decisions on each loan request from the perspective of both the offer side (approved or denied loan applications) and the borrowing side (withdrawn loan applications) before and after the new legislation, we were able to better disentangle what is "behind the scene" in the repayment capacity improvement observed above. To increase interpretability of our previous findings, we find that the improvement in the repayment capacity in the medium term appears not to be driven by a generalized credit rationing by financial institutions; on the other hand, we also observe a reduction in the opportunistic behavior of borrowers, with specific reference to the likelihood of reiterating consumer applications and then withdrawing their requests.

Novelty of this paper is twofold. Firstly, here the ‘law making’ method is based on the valence assigned to *information* within a *convergence of responsibility* in debt decisional process, based on systematic interaction between borrowers and lenders: customers are nudged, by law, to ask lenders for more and better pre-contractual and contractual information before choosing; financial intermediaries are obliged, by law, to enhance evaluation of customers’ creditworthiness before lending, through a credit scoring that should ease measure and pricing of borrower’s risk (McCorkell, 2002).

Secondly, our empirical observation is based on the meso-economic perspective of data collected by the Italian Credit Bureau (CRIF). We use data on debt behaviours that are *objective*, based on individual ‘real-life actions’, and not their ‘intentions’ or ‘declarations via questionnaires’. Our data are also powerfully *reliable*, in accuracy and width. In fact, it is agreed that the functioning of credit bureaus relies on mutually shared information amongst lenders, who have a clear incentive to contribute the best information they can on borrowers’ debt behaviours (Bos J., De Haas R., Millone M., 2015).

We believe that understanding the efficacy of regulation to improve individual and collective financial wellbeing should represent a priority. This may help formulate policy measures addressed at providing competencies and tools that can help individuals to manage their resources appropriately and to take sound borrowing decisions.

1. Decision-making and consumer debt: risks, behavioural biases and education

A sizable amount of research in the field of consumer finance has focused on understanding the role of behavioural biases in consumer decision-making. Deviation from individual and common well-being is frequently related to the condition of so-called ‘over-indebtedness’, that is caused either by unexpected events impeding the pre-planned debt service (a ‘passive’ source of risk), or by erroneous individual decision-making (an ‘active’ source of risk). Preventing ‘passive’ ‘over-indebtedness’ is quite unlikely because it is related to unpredictable events. Conversely, ‘active’ behaviours that lead to this risk deserve investigation because there are potential ways to inhibit them.

Some consumer finance literature suggests that ‘active’ causes of excessive, sub-optimal borrowing are due to a consumptive lifestyle and behavioural biases. Inter-temporal choices may be viewed as the outcome of a conflict between multiple selves with dual preferences: an impulsive myopic self and a farsighted planning self. Some models assume that these two agents act alternately (e.g. Schelling, 1984; Winston, 1980), while others capture an internal conflict between a myopic ‘doer’ and a farsighted ‘planner’ (Shefrin and Thaler, 1988). As a result, irresponsibility or short-sightedness, as well as a distorted perception of ‘time’ (for theoretical frame, see Laibson, 1997; Thaler, 1981; for empirical confirm, Meier and Sprenger, 2010; Stango and Zinman, 2009) may lead an individual to non-optimal consumption or indebtedness choices. Unrealistically optimistic attitude (Seaward and Kemp, 2000; Ausubel, 1991) or lack of self-control, related to the inability to resist pressure and temptations (Cameron and Golby, 1990; Gathergood, 2012) also appear to be detrimental. When making credit decisions, borrowers are also influenced by ‘framing effect,’ that is the way in which the consumer credit contract is disclosed (Bertrand et al. (2005). Advertising content significantly affects demand of consumer credit, by appealing "peripherally" to the borrower’s intuition rather than to reason (Bertrand et al. 2010).

From a different perspective, households might simply fail to understand the correct cost of borrowing or how to properly budget expenses within their income, due to a lack of financial literacy (among the others, Lusardi and Mitchell, 2011), or because of intrinsic cognitive limitations (Caratelli, Filotto, Mattarocci and Viale, 2015; Disney and Gathergood, 2013; Gathergood, 2012; Bajo and Barbi, 2015). However, it has been shown that although there is a correlation between lack of financial literacy and poor credit decisions, the opposite does not hold true – i.e., better financial knowledge does not necessarily lead to responsible

financial decisions. In other terms, high financial literacy does not eliminate the presence of behavioural/psychological biases.

Evidence of damages caused by behavioural biases and low levels of financial literacy both require a response from policymakers. A direct regulatory approach that serves to de-bias individual debt-decision making is definitively a challenge. Some policymakers and some theories hold that restricting access to credit could help consumers by preventing overborrowing, especially when the credit is expensive (for example, Skiba and Tobacman, 2015). However, Zinman (2010) report that restricted access has harmed, rather than helped, consumers wellbeing.

In the paragraphs that follow we aim at verifying the effectiveness of a reform that implicitly includes some interventions to reduce ‘irrationality’ of debt decision making, without restricting credit access.

2. The Italian reform of consumer credit

The European reform of consumer credit, i.e. the European Directive 2008/48/EC, aimed to balance the maintenance of accessible and affordable credit, while also ensuring and improving consumers’ protection. More specifically, rather than limiting a priori credit market accessibility, the reform favoured action towards conscious debt decision-making to thereby satisfy both sides of the market, borrowers as well as lenders.

Legislative Decree 141/2010 officially enforced the European Directive into Italian law. The new legislation introduced or strengthened pre-contractual information and debt counselling services in favour of the consumer, in order to raise awareness of debt implications. The fundamental provisions concerned¹: i) rules regarding information provided to the borrower, that must be clear, transparent, correct and comprehensive; ii) mandatory and detailed information on product description, on the terms and economic conditions applied, on measures adopted in the event of payment arrears, and on terms and conditions relating to variations in instalments that the lender must supply to raise awareness about the risks and consequences of borrowing decisions; iii) giving customers the possibility to effectively compare different loans by standardizing relevant features through the Standard European Consumer Credit Information (SECCI scheme).

On the other hand, lenders are asked to use appropriate credit evaluation procedures, and are obliged by law to assess the creditworthiness of each customer. These provisions were introduced in favour of sound lending procedures. Indeed, the *compulsory* use – for lenders- of appropriate techniques to assess the overall

¹We report part of relevant text from the European Directive 2008/48/EC. CHAPTER II ‘Information and practices preliminary to the conclusion of the credit agreement- Article 4- Standard information to be included in advertising, Paragraph 2: *The standard information shall specify in a clear, concise and prominent way by means of a representative example [...].* Article 5-Pre-contractual information, Paragraph 1: [...the lender]provide the consumer with the information needed to compare different offers in order to take an informed decision on whether to conclude a credit agreement [...] and provide adequate explanations to the consumer, in order to place the consumer in a position enabling him to assess whether the proposed credit agreement is adapted to his needs and to his financial situation, where appropriate by explaining the pre-contractual information to be provided in accordance with paragraph 1, the essential characteristics of the products proposed and the specific effects they may have on the consumer, including the consequences of default in payment by the consumer [...]. CHAPTER IV ‘Information and rights concerning credit agreements- Article 10- Information to be included in credit agreements, Paragraph 1: *Credit agreements shall be drawn up on paper or on another durable medium. [...]* Paragraph 2. *The credit agreement shall specify in a clear and concise manner: [list of 22 specific items].’*

financial situation of prospective borrowers was expected to prevent and protect consumer credit customers from excessive borrowing, preserving their financial equilibrium and repayment ability².

In this paper, we assume that *enhanced information* is a de-biasing instrument: the *shared information responsibility* required in the consumer credit market immediately before credit is given out, for both borrowers (pre-contractual and contractual information) and lenders (customer credit assessment and scoring) may alleviate behavioural biases, thus enhancing the soundness of debt decisions. In Italy, enforcement of the consumer credit reform (Legislative Decree 141/2010) offers a cut-off date to investigate any significant change in Italian debt behaviours.

3. Data and difference-in-difference methodology

We analysed a comprehensive dataset of consumer credit loans of 60,000 Italian customers, registered by the most relevant Italian Credit Bureau (CRIF) that covers 96% of the Italian market. Individuals for the analysis were randomly extracted from the entire CRIF dataset of consumer credit applicants in September 2009. Their debt situation in subsequent years (up to 2015) has been tracked, providing detailed yearly snapshots of their entire debt exposure (new credit, end of past credit) and related debt servicing (repayments). Yearly snapshots on individual debt positions are extracted at the end of September of each year. Our final dataset contains 343,264 individual-year observations in the time span 2009-2015. Table 1 reports descriptive statistics of our sample.

[Table 1 around here]

On average, in our sample each subject has less than 2 active credit lines of any type (mortgages, credit consumer loans, credit card, revolving credit) and the relative debt exposure is around 28,000 euros on average. In terms of repayment behaviour, we observe that only 6.7% of the individuals has more than three months in arrears on credit commitment; the average amount past due in total, in the last 3 and 12 months is around 248, 169 and 217 euros, respectively, but the dispersion among individuals is particularly high. Financial institutions report debt position as a non-performing loan or a loss only for 1% of individuals; therefore, it is not surprising that the number of credit institutions reporting such information is less than one for each subject. CRIF dataset also contains information on the so called “recency index”, that is the ratio between the number of credit operations started in the last 12 months and the overall number of credit operations; on average, in our sample the recency index is 21, on a scale 0-100. With regard to demographic information, for privacy reasons we had access only to the age and the residence of individuals. From Table 1 we can observe that sampled individuals are on average 43 years-old and they live mostly in the Northern Italy (44%) and Southern Italy (36%) than in Central Italy (20%) coherently with the Italian population distribution. The sample is equally partitioned between “new” consumer credit customers (Credit History = 0, meaning that the 2009 application was the first debt request of the customer) and “experienced” consumer credit customers (Credit History = 1, meaning that the individual was already recorded in the CRIF dataset as a result of previous debt position).

In order to test our hypotheses, we used a ‘difference-in-difference’ (DID) estimation, a methodology that resembles a randomized control trial. It is particularly appropriate for investigating the effects of the 2010 Italian consumer credit reform on the relationship between enhanced information by both sides of the market, and quality of borrowing decisions. This methodology compares the effect of our event (the new credit consumer law) on one group of individuals that have been influenced by this reform (i.e., the *treated* group) against a second group of individuals that we can argue are not affected by the law (i.e., the *control*

²Article 8- Obligation to assess the creditworthiness of the consumer: Paragraph 1: ‘Member States shall ensure that, before the conclusion of the credit agreement, the creditor assesses the consumer’s creditworthiness on the basis of sufficient information, where appropriate obtained from the consumer and, where necessary, on the basis of a consultation of the relevant database.’

group). The *outcome* we investigated is the repayment capacity of borrowers, measured by three alternative indices of difficulties in debt repayment, with increasing level of severity. This difference is computed for the treated group against the control group *over time*, i.e. before and after the ‘treatment’, that is the law enforcement. In this way, we could control any time-invariant factors in individuals’ borrowing behaviour, and also time series trends in Italian credit demand, due also to the economic cycle. We defined as “*treated group*” those customers sampled in September 2009 that obtained a consumer credit loan both before and after the enactment of the new regulation, and are thus directly affected by the new rules. Conversely, we defined as “*control group*” those customers sampled in September 2009 that obtained a consumer credit loan only before the enactment of the new regulation, and as a consequence, whose debt decisions were not directly affected by the new rules.

4. Empirical results

In order to analyse differences in repayment outcome, we collected information regarding difficulty in reimbursing debt as derived by the CRIF dataset. In particular, we gathered information generally created and used by lenders to track repayment behaviours of consumer credit borrowers (see Table 2).

[Table 2 around here]

The first variable (*Total credit lines*) uses the number of active loans as a risk indicator of lower repayment capacity. The underlying idea is that the use of multiple credits might reduce creditors’ ability to properly measure the probability of insolvency and might be used by households to take on an amount of credit higher than what the financial system would normally allow (D’Alessio and Iezzi, 2013). We consider the total number of loans still active on the individual position, without taking a specific number of loans as a threshold to identify the beginning of a higher risk of unsustainable debt³. Drawing on prior studies (Oxera, 2004; D’Alessio and Iezzi, 2013), the second variable (*Arrearslast3m*) captures all forms of debt for which the household is at least 3 months overdue. The cut-off is chosen in such a way to exclude temporary situations where the consumer is overdue, arising from households simply forgetting to pay a debt or contractual terms allowing a flexible payment. However, being behind in the payment of small amounts does not identify a condition of difficulty as severe as being overdue on bigger amounts. Therefore, we complete the information conceived by this variable by adding the size of the overdue amount in the last 3 months, as well as the average amount overdue in the last year in order to better characterise the persistency and the severity of the repayment difficulty condition. The last group of variables are related to administrative measures of severely compromised repayment capacity and are based on official data concerning the enforcement of formal recovery procedures. First, we simply consider the occurrence of a non-performing loans or loss signals from at least one lending financial institution (*Flag significant events*). Second, we add information concerning the number of financial institutions reporting a non-performing loan (*N. inst reporting non-perf loans*) or a permanent loss (*N. inst reporting losses*) on the position, in order to better depict the severity of the financial distress and the risk for the system. Note that while the first proxy (*Total credit lines*) is not a signal of low repayment capacity in itself, and identifies a critical situation only if combined with other information on financial difficulties, all the other variables univocally detect a situation of repayment difficulties, even though with different levels of severity.

³ For instance, Kempson et al. (2004) reported a strong relationship between individuals reporting debt repaying difficulties and being in arrears and having 4 or more credit commitments, thus, suggesting that a proper cut-off to identify a more likely situation of unsustainable debt should be 4 active credit lines. However, we believe that this cut-off cannot be generalised, especially after the expansion of credit products in recent years.

We run a principal component analysis (PCA) to obtain a reduced number of indicators of repayment capacity. We standardized original indicators mostly to include amounts overdue in calculation. We retained all factors with an eigenvalue greater than unity, and obtained three factors that explain 71.91% of the total variance in the original data⁴. The PCA results produce an interpretable solution because original indicators, as shown in Table 3, are unambiguously associated with factors that capture different and increasingly severe demonstration of low repayment capacity. Each factor has been coherently re-named. Factor 1 (Repayment Difficulties - RD) exhibits a positive association with being in arrears in the last three months and the amount overdue in the last three months, as well as with the yearly average of the unpaid debt. Focusing on Factor 2 (Repayment Crisis - RC), a debt position is identified as critical when at least one financial institution has reported a negative event to the system associated with the position, along with the number of financial institutions assigning a non-performing status to the debt holder. Finally, Factor 3 (Severe Repayment Crisis - SRC) captures the payment crisis in its most severe form as derived from the number of financial institutions reporting a permanent loss on the debt position. However, we can see that this index also exhibits a negative correlation with the number of credit lines; this is coherent with the idea that a permanent default pushes banks to restrict access to credit lines and to start recovery procedures.

[Table 3 around here]

As we deal with a panel dataset with yearly observations of individual debt positions, we employ the panel version of the DID estimator with individual and time fixed effects. The estimated model is as follows:

$$Factor_{i,t} = \alpha_i + \sigma DID + \gamma X_{i,t} + \beta year_t + \delta_1 + \varepsilon_{i,t} \quad [1]$$

where $Factor_{i,t}$ is one of three repayment capacity indices discussed above (RD, RC, SRC); DID is the interaction term between the dummy identifying the ‘treated group’ (equal to 1 for treated) and the dummy identifying the ‘treatment period’ (equal to 1 for post reform period); $X_{i,t}$ is a vector of selected variables on borrower’s debt exposure; $Year_t$ is a set of year dummies to control for time-specific heterogeneity⁵.

An important assumption of the DID method is that the treated and control subjects are similar to each other, so that the underlying time effect would have followed parallel paths for the both, in absence of the treatment (“parallel paths” assumption). However, similarity between subjects getting new credit after the law, and those who did not, is unlikely to be satisfied. We address these potential confounding factors by constructing weights designed to balance the sample. A common solution to this problem is to match treated individuals with control individuals based on the propensity score matching technique, thus creating a sample of units that received the treatment that is comparable on all observed covariates to a sample of units that did not receive the treatment (Rosenbaum and Rubin, 1983; Imbens and Wooldridge, 2009). We follow Bradley and Chen (2015) and use the weighting based on the following algorithm in order to obtain an efficient estimate of the average treatment effect on the treated group:

$$w = \begin{cases} 1 & \text{for treated individuals} \\ p/(1-p) & \text{for control individuals} \end{cases} \quad [2]$$

where p is a value from the propensity score matching calculation⁶.

⁴ The reliability of the procedure is computed using the Kaiser-Meyer-Olkin measure of sampling adequacy that returns a value of 68.22.

⁵ The DID effect is captured by σ because we did not separately add the dummy *Post reform* as an independent variable.

⁶ The above weighting scheme is clear as it gives greater weight to control individuals with higher propensity score, that means more similar to treated individuals.

We start by selecting those variables that might affect whether or not an individual gets additional credit after the law enactment and we use them as covariates of the propensity score. More specifically, we use this list: i) the so called “recency index”, that is the ratio between the number of credit operations started in the last 12 months and the overall number of credit operations; ii) the overall credit exposure which takes into account the total active credit of the individual and that is commonly used as a proxy of the economic power of the subject herself⁷; iii) the total amount past due as proxy of the creditworthiness of the individual; and iv) age and geographic residence of the subject⁸. Since we use these variables to predict the new credit after the law enactment, we lag them by one year in the regressions (covariates at 2010). In Table 4, we compare these variables for the treated and control individuals. The statistics indicate some differences, primarily due to the credit history of subjects. On the contrary, no differences are revealed in terms of socio-demographic characteristics.

[Table 4 around here]

We run logit regression on the treated dummy (1 if getting new credit after the law enforcement; 0 elsewhere) using the set of characteristics described above. Consistent with statistics in Panel A, model 1 in Panel B suggests that individuals who have not asked for a loan recently (lower recency index), have greater economic power (as indirectly suggested by the overall exposure towards the credit system), and who have higher creditworthiness (lower amount past due), are more likely to get new consumer credit after 2010. Socio-demographic characteristics that are not significantly different based on the t-test in Panel A, are not significant in the regression; therefore, for sake of parsimony we entertain a second model (model 2 in Panel B), where we keep only the significant determinants to estimate our propensity score p (that is the probability of getting new credit). We find that model 2 satisfies the balancing property, which is another reason we employ this model⁹.

Using the estimated propensity score p and the weighting scheme in equation [1], we examine the overall effect of new regulation on the three indicators of repayment capacity described above (RD, RC, SRC). We extend the post-treatment period till the end of our data (year 2015), as the repayment capacity is a phenomenon that can be ascertained over time¹⁰.

[Table 5 around here]

Table 5 offers results of estimations of equation 1 showing that the coefficient of DID is always negative, whatever the indicator of repayment capacity is considered. This evidence is consistent with the view that the new regulation has improved credit allocation. In light of the new information obligation introduced by law, and given that we control some individual characteristics, our results suggest that a mandatory informative marketplace enhances the quality of credit distribution and benefits borrowers’ repayment capacity.

Prominent works on relationship banking have underlined the importance of long-term commitment in the bank-customer relationship and the likely strategic interactions between a credit supplier and its established

⁷ As a rule of thumb, lenders often use a 1:3 proportion rule between the amount of credit granted and personal income/wealth, meaning that subjects with larger credit exposure are usually those with higher income/wealth.

⁸ For privacy concerns, we did not have access to further socio-demographic information.

⁹ The balancing property is aimed at verifying that the balance of covariates is achieved between treated and control groups. It is derived by subdividing the population into "blocks" and then requiring that balance of covariates is reached within each block. In order to make the balancing achievement easier, we use the terzile transformation of each explanatory variable.

¹⁰ In unreported analysis, we have also run a diff-in-diff estimation using a symmetric period pre- and post- regulation, with consistent results.

customers (see, among others, Elyasiani and Goldberg, 2004, Mayer, 1988). Long-term bank-customers relationships provide lender with more available information (at both the bank and credit bureau level) to distinguish high- and low-credit quality borrowers; this may in turn facilitate the on going credit assessment of the client. Therefore, new consumer credit legislation might have brought about major changes in the credit allocation conditioning on the availability of already existing information. Coherently, in order to explore the relevance of outstanding bank-customers relationships, we extend the analysis and analyze the potentially differential effects of enhanced information induced by law on the credit allocation conditional on the credit history of the client. Specifically, we create a dummy variable (Credit History) equal to one if in 2009 the consumer credit applicant was already in the CRIF dataset because of previous debt requests, and equal to zero if conversely the applicant was ‘new entrant’ in the Credit Bureau dataset (meaning that the 2009 application was the first debt contact between applicant and any financial intermediary). Then, we conduct subsample analyses according to equation 1, but contingent on holding a credit history (Credit History equal to one) or not.

[Table 6-7 around here]

Prima facie evidence suggests otherwise (Table 6-7): the subsample of customers with no Credit History in 2009 produces estimates that are not remarkably different, both in magnitude and in significance, compared to the subsample of individuals with an existing Credit History in the Credit Bureau dataset. Therefore, we might argue that improvement in credit allocation following the law enactment does not seem to be a byproduct of the bank-customer relation.

5. Micro-level evidence

The frame of a large, longitudinal sample of households exploited in Section 3 and 4 is appropriate to provide evidence regarding any improvement in repayment capacity among credit consumers in Italy after the enactment of new consumer credit legislation. Nevertheless, while these data are ideal for producing an estimate of the scope of the problem (efficacy of new regulation), a micro-level data set focusing on loan requests could provide further support for individual behaviors within the bank-customer loan negotiation.

To this end, we randomly extracted two cohorts of 60,000 customers, one year before the enactment of the law (September 2009, pre-law cohort) and one year after the enactment of the law (September 2011, post-law cohort). For each customer, we analyze any credit loan request that was addressed to Italian financial institutions during the 30 days of the sample-month (September 2009 for the pre-law cohort, September 2011 for the post-law cohort). These two cohorts equally include experienced individuals, i.e. those customers that have already addressed a credit request before the sample-month (Credit History = 1), and new entrant customers, i.e. those individuals that have never accessed the credit market before (Credit History = 0). As sample individuals might have submitted multiple credit applications within the same sample-month, the total number of requests is higher than the number of unique individuals in each cohort (see table 8).

[Table 8 around here]

In addition to some basic socio-economic information for these individuals (age, place of residence, global exposure to credit market), CRIF also provides specific and detailed information on each loan request (type of consumer credit contract, amount and maturity of the requested loan, type of “good” underling the requested loan, credit score and index of financial constraints). Furthermore, the status of the requested loan (approved, denied, withdrawn, outstanding) is reported. The summary statistics from this additional micro-level dataset on loan requests are presented in Table 9.

[Table 9-10 around here]

The two cohorts of individuals are statistically comparable in terms of average (median) age (around 42 and 41, respectively) and geographical distribution, whilst the global exposure to the credit market is higher in 2011. Moreover, loan requests' features do not seem to change dramatically between them. The prevalence of Installment loans¹¹ is verified in both cohorts (59.67% in 2009 and 58.75% in 2011) as well as the average maturity and amount of the loan required (approximately 7,500 euros and 41 months). In terms of type of "good" conceived as the "consumer goal" of the loan, we observe an increase in credit requests for electronic items. Overall, the percentage of loan requests that are approved, denied, withdrawn, or still outstanding are comparable between the two cohorts, even though in 2011 we observe less accepted and withdrawn loan requests and higher denied and still outstanding loans. From Table 10, we derive some evidence on the Credit Score and on the Index of Financial Constraints available only for experienced customers. The highest concentration of individuals is in the middle credit risk score for the first variable (letter E-L) and in the top two levels for the second variable (IFC 1-2). Note that statistics of Table 10 complement description of the sample, but cannot be exploited in forthcoming empirical analysis because limited to experienced customers only (that is customers with a Credit History equal to 1).

The data associated with each loan request are used for the purpose to shed some light on individual behaviors at the inception of the loan during the negotiation between the intermediary and the customer. The variables associated with the outcome of the loan (approved, denied, withdrawn¹²) isolate the attitude of either lender or borrower in approaching the credit market, and allow us to measure if this attitude has changed before and after the enactment of the law.

More specifically, on the one hand, approved and denied loans summarize the decision of the creditor to accept or refuse the request for credit on the basis of the pertinent information. The approval/denial rate might signal the tightness of the selective procedure employed by credit institutions. Actually, over the period analyzed (that overlaps the post-subprime crises), lenders were especially reluctant to lend to borrowers whose credit, income, or home values deteriorated substantially; therefore, it is interesting to better investigate micro-level behaviors of credit institutions in order to figure out if the observed improvement in repayment capacity is rather a spurious effect driven by a generalized reduction in credit offering and credit rationing.

On the other hand, in case of withdrawn loans applications, the creditor does not make a credit decision, but the applicant does: during the time that the creditor is gathering information to make a decision on the application, the applicant may notify the creditor that he or she no longer wants to pursue the credit request and this is his/her responsibility. It is possible that withdrawn applications signal a more responsible behavior on the demand side. Enhanced information set introduced by the law could give rise to customers that are more conscious of their possibility and less prone to insist on loan requests when their creditworthiness does not support this choice. However, in unreported analysis, we observe that withdrawing loan request is a likely correlated dimension of multi-positioning in credit requests. 43 per cent of customers

¹¹ Non installment credit does not have monthly payments of a set figure, but instead it is due all at once in a lump sum payment of the full amount owed. On the contrary, Installment credit allows the consumer to receive a certain amount of credit to purchase one item or a few goods; the credit does not extend beyond the sale price of the good and the consumer pays the credit in installments over a period of time.

¹² Outstanding loan requests are not considered here as they are a residual class of still pending contracts, comprising requests that have been reported in the system at the time of the inception but whose outcome is unknown (for example, because the financial institution has not updated information on the position later on).

backing out of their original loan request have asked for at least two consumer credit loans during the sample month; the same percentage is remarkably lower (15.32 per cent) if we observe those individuals that do not withdraw. Moreover, conditional on a set of individual characteristics, we find a negative relationship between the Credit Score of the customer and the likelihood of both reiterate credit applications and then withdrawing credit requests, meaning that customers with higher creditworthiness are less likely to take on this behavior. Therefore, we rather interpret withdrawn loan requests as a proxy of opportunistic borrowing behavior on the demand side.

Using the same strategy described in Section 3, we run a diff-in-diff analysis on loan requests. As we already discussed, this methodology compares the effects of an event (a consumer credit law change in our setting) on groups that are more affected by regulation changes (i.e. treated group) with those that are less affected by the changes (i.e. control group). We classify individuals based on their preexisting experience in the credit market. Experienced customers (Credit History = 1) are classified as ‘treated’ individuals: we argue that their direct experience in the consumer credit market, associated with the inevitable relation with a financial intermediary, increases their attitude/awareness of the regulatory change, thus, making these subjects more likely to be affected by the new rules. ‘Control’ individuals here are the new entrant costumers (Credit History = 0), because we assume that these individuals, that have never accessed the consumer credit market before the sample-month, should have paid less attention/are less aware of consumer credit reform, and are thus likely to be less affected by the new rules.

More specifically, we estimate the following regressions (combining across the two sample cohorts) to predict the likelihood of a loan request to be approved, denied, withdrawn before and after the enactment of the law.

$$Loanstatus_i = \alpha_i + \beta treated_i + \delta post_reform_i + \sigma DID_i + \gamma X_i + \varepsilon_{i,t} \quad [2]$$

where $Loanstatus_i$ is one of the three possible outcomes for loan request (approved, denied, withdrawn loans); DID is the interaction term between the dummy identifying the ‘treated group’ (equal to 1 for treated) and the dummy identifying the ‘treatment period’ (equal to 1 for September 2011); $X_{i,t}$ is a vector of selected variables on borrower’s characteristics (age, residency, global exposure) as well as on loan request’s features (loan amount, maturity, installment/non installment contract, type of “good”).

[Table 11-13 around here]

In results reported in Tables 11-13, we find that overall treated individuals are more (less) likely to be accepted (rejected) and less prone to back out of their loan before approval. Moreover, the post reform period is negatively (positively) and significantly associated with the probability of approving (denying) a loan requests as well as with the likelihood of backing out (except in the last model of Table 13). Notably, conditional on a set of covariates, our DID variable is always a statistically significant predictor of the Loan Status, showing a positive influence on the probability of acceptance and a negative impact on both the likelihood of rejecting and withdrawing the loan request. We interpret this significant relation with caution, as we rely on some assumptions to create our treated and control group. Nonetheless, based on our evidence, it appears that financial intermediaries were more responsive to credit requests when the information set is available (experienced customers) and even enhanced (due to the law enactment); therefore, our results does not support the alternative view of improvement in credit allocation driven by institutions that are simply acting a credit rationing measure. At the same time, it appears that after the enactment of the law, households were less prone to employ opportunistic behaviour and to back out of the loan before the approval. Taken together, these evidences suggest that the shared information responsibility required in the consumer credit

market before a credit is given out may have enhanced the soundness of debt decisions, that in the medium term results in a better repayment capacity.

5. Discussion and conclusions

Widely supported evidence of behavioural biases and/or cognitive constraints in debt decision-making lead to an unsolvable dilemma for regulators. On the one hand, policy-makers could allow consumers the freedom to take their own (even though unsustainable) risks, but this would be detrimental to the individual financial wellbeing. On the other hand, access to credit could be authoritatively controlled and restricted to protect consumers from making adverse decisions; however, this would be at the expense of a likely sub-optimal outcome for financial industry, for consumers, and also for the wider economy itself.

In this paper we explore if enhanced information introduced in the consumer credit market by law is able to de-bias debt decision-making. Our empirical findings provide evidence that in the medium term, the new Italian consumer credit regulation has had a positive impact on borrowers' repayment ability, compared to the pre-law situation, even after having controlled the 'parallel paths assumption'. If we assume that unsound borrowing decisions generally end in bad repayment, and that most of unsound decisions are driven by 'irrational' behaviours, this evidence is consistent with the idea that enhanced mandatory information has been effective in de-biasing debt decisions. Moreover, our evidence leads us to believe that the credit consumer law had uniform impact on the credit allocation across all clients, independently from their credit history and bank relationship.

Our complement micro-level data on individual consumer credit requests helps clarify that this evidence does not appear to be driven by a generic credit rationing by financial institutions over the period analyzed (that partially overlaps the post-subprime crisis), resulting in lending only to very high-quality borrowers; moreover, at least partially our evidence could also be explained by a more responsible borrowing behavior, as shown by the relatively lower likelihood of withdrawn loan applications after the enactment of the law, where withdrawals are proved to be a proxy of opportunistic behavior on the demand side.

Credit lenders and borrowers have become more information dependent after the law. Lenders are required to assess the specific borrower's credit risk; borrowers are supported by strengthening pre-contractual information. In this perspective, the consumer credit market has provided a further opportunity to examine the 'lender-borrower relationship' in the presence of asymmetric information and related consequences in terms of moral hazard and adverse selection (Dobbie and Skiba, 2013). Our results seem to shed a reassuring light on the efficacy of two typically 'rational' tools for nudging sound behaviours: law and information. Our evidence on positive outcome in the Italian consumer credit market, after the law enforcement, seems to confirm also the efficiency gain generated by credit bureaus as in de Janvry, McIntosh and Sadoulet, (2010), when credit bureaus work in condition when information and its role is shared and understood by both side of the market.

Nevertheless, we need to consider that 'more information' or 'better disclosure' is not definitively sufficient to ensure right perceptions and understanding from the 'public', or 'normal people' (Kurz-Milcke et al., 2008). We believe that our undoubtedly positive results are due to the *conjunct adaptation* of behaviours of *both* the demand *and* offer side of the consumer credit marketplace. De-biasing of debt decisions is therefore the final consequence of an increased commitment and interactive process of information and knowledge exchange between borrowers and lenders, that undeniably leads to an improvement of not only individual, but also common, well-being.

References

- Alessie R., Hochguertel S., Weber G., (2005) Consumer Credit: Evidence from Italian Micro Data, *Journal of the European Economic Association* March 2005 3(1):144–178
- Ausubel L.M. (1991) The failure of competition in the credit card market, *American Economic Review*, 81 (1), 50-81.
- Bajo E., Barbi M. (2015) Out of sight, out of mind: financial illiteracy, inattention, and sluggish mortgage refinancing, Working Paper.
- Berger AN, Udell GF (1995) Relationship lending and lines of credit in small firm finance. *J Bus* 68:351–381
- Bertrand M., Karlan D., Mullainathan S., Shafir E., Zinman J. (2005) What's psychology worth ? A field experiment in the consumer credit market, Massachusetts : National Bureau of Economic Research, 2005, Working Paper 11892.
- Bertrand M., Karlan D., Mullainathan S., Shafir E., Zinman J. (2010) What's Advertising Content Worth? Evidence from a Consumer Credit Marketing Field Experiment, *The Quarterly Journal of Economics*, Oxford University Press, vol. 125(1), 263-306.
- Bos J., De Haas R., Millone M. (2015) Show me yours and I'll show you mine: sharing borrower information in a competitive credit market, *European Banking Center Discussion Paper* No. 2015-007/027.
- Bradley and Chen (2015), Does Board Independence reduce the cost of debt?, *Financial Management*, 15-47.
- Cameron S., Golby, D., (1990) An Economic Analysis of Personal Debt, *Bulletin of Economic Research*, 42 (3), 1990, 241-247.
- Caratelli M., Filotto U., Mattarocci G., Viale R. (2015) Empowering Borrowers: Is the APR the most appropriate choice indicator? A behavioral and empirical analysis”, in *EUROPEAN BANKING 3.0 - Bank Industry and Supervision in the Behavioural Finance Revolution* - Bracchi, Umberto, Masciandaro, Editors, Edibank, Roma 2015
- D'Alessio G., Iezzi S., (2013) Household over-indebtedness: definition and measurement with Italian data, *Questioni di Economia e Finanza (Occasional Paper)*, n. 149, 2013, 1-28.
- de Janvry, A., McIntosh C., Sadoulet E. (2010), "The Supply and Demand Side Impacts of Credit Market Information." *Journal of Development Economics*, 93(2): 173-188.
- Dobbie W., Skiba P.M. (2013), *Information Asymmetries in Consumer Credit Markets: Evidence from Payday Lending*
- Disney R., Gathergood J. Financial literacy and consumer credit portfolios, *Journal of Banking and Finance*, 37 (7), 2013, 2246-2254.
- Elyasiani, E., & Goldberg, L. G. (2004). Relationship lending: A survey of the literature. *Journal of Economics and Business*, 56(4), 315–330.
- Gathergood J. (2012), Self-control, financial literacy and consumer over-indebtedness, *Journal of Economic Psychology*, 33 (3), 590-602.
- Getter D.E., (2006), *Consumer Credit Risk and Pricing*, *The Journal of Consumer Affairs*, Vol. 40, No. 1.
- Imbens. G.W., and J.M. Wooldridge (2009), Recent development in the econometrics of program evaluation, *Journal of Economic Literature* 47, 5-86.

- Kurz-Milcke E., Gigerenzer G., Martignon L. (2008), Transparency in Risk Communication Graphical and Analog Tools, *Annals of the New York Academy of Sciences*, 1128: 18–28
- Laibson D., Golden eggs and hyperbolic discounting (1997) *Quarterly Journal of Economics*, 112 (2), 443-477.
- Livshits I. Recent Developments In Consumer Credit And Default Literature, 2015, *Journal of Economic Surveys* (2015) Vol. 29, No. 4, pp. 594–613
- Lucarelli C. Brighetti G. (Eds.)(2011) *Risk Tolerance in Financial Decision Making* Editors, Palgrave Macmillan, UK.
- Lusardi A., Mitchell O.S., (2011) Financial literacy around the world: an overview, NBER Working Paper No. 17107, 1-19.
- Magri S., 2015, Are Lenders Using Risk-Based Pricing in Consumer Loan Market? The effect of the crisis._
- McCorkell, P. L. (2002). The impact of credit scoring and automated underwriting on credit availability. In T. Durkin & M. E. Staten (Eds.), *The impact of public policy on consumer credit* (pp. 209–219). Boston: Kluwer Academic Publishers.
- Meier S., Sprenger C., 2010, Present-biased preferences and credit card borrowing, «*American Economic Journal: Applied economics*», 74 (2), 1-11.
- Mester L.J. (2015), Consumer Credit: Suggested Directions for Policy-Relevant Research, Remarks at the Conference on Regulating Consumer Credit A Joint Conference of the Federal Reserve Bank of Philadelphia and the Journal of Economics and Business
- Oh J.H., Johnston W.J., 2014, Credit lender–borrower relationship in the credit card market – Implications for credit risk management strategy and relationship marketing, *International Business Review* (2014)
- Rosenbaum P.R., and D.B. Rubin (1983), The central role of the propensity score in observational studies for causal effects, *Biometrika* 70, 41-55.
- Schelling T.C. (1984) Self-command in practice, in policy, and in theory of rational choice, *American Economic Review*», 2 (1), 193-210.
- Seaward G.W. H., Kemp S. (2000) Optimism bias and student debt, *New Zeland Journal of Psychology*, 29 (1), 17-19.
- Shefrin H.M., Thaler R.H. (1988) The behavioral life-cycle hypothesis, *Economic Inquiry*, 26 (4), 609-643.
- Skiba, P. M., and Tobacman, J. (2015), Do payday loans cause bankruptcy?, working paper
- Stango V., Zinman J. (2009) Exponential growth bias and household finance, *The Journal of Finance*, 64 (6), 2807-2849
- Thaler R.H., (1981) Some empirical evidence on Dynamic Inconsistency, *Economic Letters*, 8, 201-207.
- Wang, X. T. (1996) Domain-specific rationality in human choices: Violations of utility axioms and social contexts. *Cognition*, 60.1: 31-63.
- Winston G.C., Addiction and backsliding: a theory of compulsive consumption, *Journal of Economic Behavior and Organization*, 1, 1980, 295-324.
- Zinman J., (2010), Restricting consumer credit access: Household survey evidence on effects around the Oregon rate cap, *Journal of Banking & Finance* 34 (2010) 546–556

Table 1 – Descriptive statistics

This table reports summary statistics for the variables used in the study.

Variables	N	Mean	Min	Max	Median	Sd
Total credit lines	343,264	1.8312	0	29	1	1.7246
Credit Exposure	343,264	27,579.78	0	3,366,637	4,417	67,504.9
Arrears last3m	343,264	0.0665	0	1	0	0.2492
Past due 3m	343,264	169.0900	0	460,000	0	2,154.2060
Past due average 12m	343,264	216.9890	0	354,355	0	2,309.5710
Total amount past due	343,264	248.4765	0	389,394	0	2,817.5980
Flag significant events	343,264	0.0102	0	1	0	0.1005
N. inst reporting non perf loans	343,264	0.0710	0	9	0	0.3293
N. inst reporting losses	343,264	0.0035	0	4	0	0.0604
Recency index	343,264	21.1224	0	100	0	31.5116
Age	339,194	43.1501	18	96	42	14.6052
North	272,571	0.4395	0	1	0	0.4963
South	272,571	0.3600	0	1	0	0.4800
Center	272,571	0.2004	0	1	0	0.4003
Credit History (= 1)	343,264	0.4988	0	1	0	0.5000

Table 2 – Original indicators of ‘repayment capacity’

This table reports definition of variables reported in the dataset provided by CRIF and related to the repayment capacity of consumer credit borrowers

Indicators	Definition
Total credit lines	Total numbers of active credit commitments (mortgages, credit consumer loans, credit card, revolving credit)
Arrears last3m	Dummy equal to 1 if the borrower has more than 3 months in arrears on a credit commitment
Past due 3m	Total amount that has been past due in the last 3 months
Past due average 12m	Average amount that has been past due in the last 12 months
N. inst reporting non perf loans	Number of financial institutions reporting the debt position as a non-performing loan in the Credit Bureau system
N. inst reporting losses	Number of financial institutions reporting the debt position as a permanent loss in the Credit Bureau system
Flag significant events	Dummy equal to 1 if there is at least one financial institution reporting the debt position as a non-performing loan or a loss in the Credit Bureau system

Table 3 – Factors of ‘repayment capacity’

This table reports the loadings on original CRIF repayment capacity variables for each of the three factors (reported in order of total variance explained). We retain variables where the absolute value of the loading exceeds 0.40.

Factor 1 (Repayment Difficulties - RD)		Factor 2 (Repayment Crisis - RC)		Factor 3 (Severe Repayment Crisis-SRC)	
Indicators	Component loading	Indicators	Component loading	Indicators	Component loading
Arrears last3m	0.5353	Flag significant events	0.6799	Total credit lines	-0.4964
Past due 3m	0.5209	N inst reporting non perf loans	0.5363	N inst reporting losses	0.7849
Past due average 12m	0.5091				

List of original indicators with a correlation with factors higher than 0.40 in absolute value.

Table 4 – Propensity Score Analysis

This table reports the results on the determinants of the probability of getting additional credit after the law enactment (propensity score). Panel A compares the characteristics of individuals getting or not getting new credit after the law enactment that may determine the probability. Panel B presents the logit regression results predicting getting new credit status. Standard errors are adjusted for heteroskedasticity and are in parenthesis. ***, ** and * denote significance at the 1, 5, and 10% level, respectively.

<i>Panel A. Comparison between treated and control individuals</i>			
Variable	Treated group	Control group	Difference
Recency index	54.7318	66.0557	11.3239***
Credit exposure	33,498	21,040.52	-12,457.47***
Total amount past due	64.6416	264.4956	199.854***
Age	34.1596	34.1085	-0.0511
North	0.4395	0.4398	0.0003
South	0.3606	0.3622	0.0015
Center	0.1999	0.1980	-0.0018

<i>Panel B. Regression analysis on the propensity for treated status</i>			
<i>Independent variable: treated dummy (1 if getting new credit after the law enforcement; 0 elsewhere)</i>			
Dependent variable	model (1)	model (2)	
Recency index	-0.133***	-0.126***	
	(0.020)	(0.018)	
Total amount past due	-0.645***	-0.648***	
	(0.021)	(0.018)	
Credit exposure	0.487***	0.487***	
	(0.021)	(0.018)	
Age	0.001		
	(0.001)		
Nord	-0.005		
	(0.027)		
South	-0.012		
	(0.028)		
Pseudo R2	0.0321	0.0327	
Observations	41,367	52,148	

Table 5 – Effects of new consumer credit regulation on borrowers repayment capacity

This table reports the results of unbalanced panel regression of repayment indeces on diff-in-diff estimator and other control variables over the period 2009-2015. All our specification include individual and year fixed effects. Standard errors are adjusted for heteroskedasticity and are in parenthesis. ***, ** and * denote significance at the 1, 5, and 10% level, respectively.

	RD	RC	SRC
Recency index	0.255*** (0.007)	0.207*** (0.0078)	-0.128*** (0.007)
Total amount past due	1.778*** (0.011)	-0.716*** (0.009)	0.299*** (0.007)
Credit exposure	-0.177*** (0.007)	-0.403*** (0.009)	-0.103*** (0.007)
DID	-0.034*** (0.009)	-0.079*** (0.008)	-0.118*** (0.007)
Individual FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Adjusted R2	0.4668	0.1959	0.0564
Observations	340,214	340,214	340,214

Table 6 – Effects of new consumer credit regulation on borrowers repayment capacity(subsample = Credit History variable equal to 1)

This table reports the results of unbalanced panel regression of repayment indeces on diff-in-diff estimator and other control variables over the period 2009-2015 for the subsample of individuals with a credit history equal to 1. Credit history is defined as the presence of the individual in the CRIF dataset before 2009. All our specification include individual and year fixed effects. Standard errors are adjusted for heteroskedasticity and are in parenthesis. ***, ** and * denote significance at the 1, 5, and 10% level, respectively.

	RD	RC	SRC
Recency index	0.258*** (0.009)	0.212*** (0.011)	-0.117*** (0.009)
Total amount past due	1.770*** (0.016)	-0.717*** (0.012)	0.297*** (0.010)
Credit exposure	-0.179*** (0.009)	-0.404*** (0.013)	-0.110*** (0.010)
DID	-0.027** (0.012)	-0.070*** (0.012)	-0.115*** (0.010)
Individual FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Adjusted R2	0.4672	0.1982	0.0587
Observations	169,634	169,634	169,634

Table 7 – Effects of new consumer credit regulation on borrowers repayment capacity(subsample = Credit History variable equal to 0)

This table reports the results of unbalanced panel regression of repayment indices on diff-in-diff estimator and other control variables over the period 2009-2015 for the subsample of individuals with a credit history equal to 0. Credit history is defined as the presence of the individual in the CRIF dataset before 2009. All our specification include individual and year fixed effects. Standard errors are adjusted for heteroskedasticity and are in parenthesis. ***, ** and * denote significance at the 1, 5, and 10% level, respectively.

	RD	RC	SRC
Recency index	0.252*** (0.009)	0.202*** (0.011)	-0.138*** (0.009)
Total amount past due	1.784*** (0.016)	-0.716*** (0.012)	0.300*** (0.010)
Credit exposure	-0.175*** (0.009)	-0.401*** (0.012)	-0.095*** (0.009)
DID	-0.040*** (0.009)	-0.087*** (0.011)	-0.121*** (0.007)
Individual FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Adjusted R2	0.4665	0.1938	0.0544
Observations	170,580	170,580	170,580

Table 8. Sample of individuals and loan requests in each sample month

This table reports the number of unique individuals and the number of loan requests for the two cohorts of customers analysed in the study in each sample-month (September 2009, pre-law cohort; September 2011, post-law cohort).

	Samples			
	Sample 2009		Sample 2011	
	pre-law cohort		post-law cohort	
	N. individuals	N. loan requests	N. individuals	N. loan requests
Experienced customers	30,000	32,896	30,000	33,745
New-entrant customers	30,000	32,658	30,000	34,241
Total	60,000	65,554	60,000	67,986

Table 9 – Descriptive statistics

This table reports summary statistics for the micro-dataset on loan requests for the two cohorts of customers (September 2009, pre-law cohort; September 2011, post-law cohort).

Sample 2009						
Variables	N	Mean	Min	Max	Median	Sd
Age	64,794	42.9630	18	96	42	14.5600
North	65,554	0.3473	0	1	0	0.4761
South	65,554	0.2923	0	1	0	0.3662
Center	65,554	0.1596	0	1	0	0.3662
Credit Exposure	65,554	17,924.78	0	289,916	0	49,781.14
Installment credit	65,554	0.5967	0	1	0	0.4906
Loan amount	63,039	7,711.772	300	37,966	5,250	7,794.0840
Loan maturity (months)	65,550	41.5118	6	120	36	26.8516
Type of “good”						
- Transports	65,554	0.1883	0	1	0	0.3940
- Electronics	65,554	0.0816	0	1	0	0.2737
- Furniture	65,554	0.0870	0	1	0	0.2818
- Travel	65,554	0.0304	0	1	0	0.1716
- Consumption	65,554	0.0502	0	1	0	0.2183
- Others	65,554	0.5626	0	1	1	0.4961
Approved	65,554	0.5897	0	1	1	0.0492
Denied	65,554	0.2219	0	1	0	0.4155
Withdrawn	65,554	0.0834	0	1	0	0.2765
Outstanding	65,554	0.1049	0	1	0	0.3065
Sample 2011						
Variables	N	Mean	Min	Max	Median	Sd
Age	67,459	42.2934	19	76	41	14.4015
North	67,986	0.3237	0	1	0	0.4679
South	67,986	0.2721	0	1	0	0.4451
Center	67,986	0.1508	0	1	0	0.4451
Credit Exposure	67,986	19,000.06	0	289,916	0	51,331.6
Installment credit	67,986	0.5875	0	1	0	0.4923
Loan amount	61,958	7,369.168	300	37,966	5,000	7,939.148
Loan maturity (months)	67,976	41.46228	6	120	36	28.2454
Type of “good”						
- Transports	67,986	0.1569	0	1	0	0.3637
- Electronics	67,986	0.1606	0	1	0	0.3671
- Furniture	67,986	0.0970	0	1	0	0.2959
- Travel	67,986	0.0307	0	1	0	0.1725
- Consumption	67,986	0.0450	0	1	0	0.2073
- Others	67,986	0.5100	0	1	1	0.4999
Approved	67,986	0.5731	0	1	1	0.4946
Denied	67,986	0.2402	0	1	0	0.4272
Withdrawn	67,986	0.0756	0	1	0	0.2642
Outstanding	67,986	0.111	0	1	0	0.3144

Table 10 - Credit Score and Index of Financial Constraints (IFC)

This table reports frequency distribution for the Credit Score and the Index of Financial Constraints for the two cohorts of customers (September 2009, pre-law cohort; September 2011, post-law cohort).

(values from A- high risk to P – low risk)

Score	Sample 2009		Sample 2011	
	Freq.	Percent	Freq.	Percent
A	926	3.09	796	2.65
B	574	1.91	488	1.63
C	1,073	3.58	964	3.21
D	1,138	3.79	1,088	3.63
E	1,223	4.08	1,273	4.24
F	744	2.48	752	2.51
G	873	2.91	763	2.54
H	2,655	8.85	2,669	8.90
I	3,238	10.79	3,535	11.78
L	3,992	13.31	4,345	14.48
M	4,058	13.53	4,102	13.67
N	2,885	9.62	2,852	9.51
O	3,643	12.14	3,419	11.40
P	2,978	9.93	2,954	9.85
Total	30,000	100.00	30,000	100.00
Mean	9.2316 (I)		9.3213 (I)	

(values from 1 – low financial constraints to 7 – high financial constraints)

IFC	Sample 2009		Sample 2011	
	Freq.	Percent	Freq.	Percent
1	9,938	33.13	11,329	37.76
2	5,783	19.28	5,495	18.32
3	1,224	4.08	1,229	4.10
4	1,090	3.63	972	3.24
5	2,457	8.19	2,536	8.45
6	1,157	3.86	1,073	3.58
7	676	2.25	719	2.40
missing	7,675	25.58	6,647	22.16
Total	30,000	100.00	30,000	100
Mean	2.3897		2.3477	

Note: Data on Credit Scores and Financial Constraints are reported only for experienced customers (Credit History = 1), in each cohort (2009 and 2011). Moreover, missing data for the Index of Financial Constraints are due to the practice of not calculating the variables for customers with very high risk Credit Score (for instance, individuals with Credit Score equal to A or B).

Table 11 – Effects of new consumer credit regulation on *Approved loans*

This table reports the results of probit regressions of *Approved loans* on diff-in-diff estimator and other control variables. Standard errors are adjusted for heteroskedasticity and are in parenthesis. ***, ** and * denote significance at the 1, 5, and 10% level, respectively.

	Approved loans	Approved loans	Approved loans
Treated	0.1905*** (0.0105)	0.2222*** (0.0106)	0.1996*** (0.0111)
Post_reform	-0.1206*** (0.0103)	-0.0940*** (0.0103)	-0.1780*** (0.0112)
DID	0.1551*** (0.0147)	0.1491*** (0.0148)	0.1416*** (0.0160)
Age	0.0109*** (0.002)	0.0111*** (0.0003)	0.0115*** (0.003)
Nord	0.0092 (0.0088)	0.0443*** (0.0089)	0.0333*** (0.0096)
South	-0.1415*** (0.0092)	-0.1445*** (0.0047)	-0.2067*** (0.0101)
Loan amount	-0.0635*** (0.0045)	-0.0133*** (0.0047)	0.0037 (0.0058)
Loan maturity	-0.0083*** (0.0002)	-0.0060*** (0.0002)	-0.0087*** (0.0002)
Installment credit		0.4971*** (0.0087)	
Transports			1.03096*** (0.0119)
Electronics			1.3190*** (0.0157)
Furniture			1.1443*** (0.0144)
Travel			1.3867*** (0.0279)
Consumption			1.9432*** (0.0279)
Pseudo R2	0.0508	0.0706	0.2227
Observations	123,811	123,811	123,811

Table 12 – Effects of new consumer credit regulation on *Denied loan applications*

This table reports the results of probit regressions of *Denied loans* on diff-in-diff estimator and other control variables. Standard errors are adjusted for heteroskedasticity and are in parenthesis. ***, ** and * denote significance at the 1, 5, and 10% level, respectively.

	Denied loan applications	Denied loan application	Denied loan application
Treated	-0.1684*** (0.0115)	-0.1991*** (0.0117)	-0.1538*** (0.0118)
Post_reform	0.0721*** (0.0111)	0.0399*** (0.0112)	0.1153*** (0.0115)
DID	-0.0943*** (0.0160)	-0.0869*** (0.0162)	-0.0824*** (0.0166)
Age	-0.0110*** (0.0003)	-0.0112*** (0.0002)	-0.0110*** (0.0003)
Nord	0.0431*** (0.0097)	0.0034 (0.0098)	0.0369*** (0.0101)
South	0.1970*** (0.0099)	0.2039*** (0.0101)	0.2306*** (0.0104)
Loan amount	-0.0655*** (0.0048)	-0.1341*** (0.0051)	-0.1440*** (0.0059)
Loan maturity	0.0096*** (0.0002)	0.0072*** (0.0002)	0.0102*** (0.0002)
Installment credit		-0.5758*** (0.0097)	
Transports			-0.7308*** (0.0128)
Electronics			-0.9082*** (0.01667)
Furniture			-0.6100*** (0.0154)
Travel			-1.1228*** (0.0318)
Consumption			-1.6094*** (0.0359)
Pseudo R2	0.0379	0.0649	0.1146
Observations	123,811	123,811	123,811

Table 13 – Effects of new consumer credit regulation on *Withdrawn loan applications*

This table reports the results of probit regressions of *Withdrawn loans* on diff-in-diff estimator and other control variables. Standard errors are adjusted for heteroskedasticity and are in parenthesis. ***, ** and * denote significance at the 1, 5, and 10% level, respectively.

	Withdrawn loan applications	Withdrawn loan applications	Withdrawn loan applications
Treated	-0.0672*** (0.0147)	-0.0696*** (0.0147)	-0.0586*** (0.0148)
Post_reform	-0.0335** (0.0148)	-0.0361** (0.0148))	-0.0098 (0.0149))
DID	-0.0437** (0.0210)	-0.0431** (0.0210))	-0.0389* (0.0213)
Age	-0.0035*** (0.0004)	-0.0035*** (0.0004)	-0.0030*** (0.0004)
Nord	-0.0222* (0.0126)	-0.0249** (0.0126)	-0.0291** (0.0128)
South	0.0323** (0.0130)	0.0323** (0.0130)	0.0455*** (0.0133)
Loan amount	0.1228*** (0.0066)	0.1192*** (0.0067)	0.1067*** (0.0076)
Loan maturity	0.0014*** (0.0003)	0.0012*** (0.0003)	0.0010*** (0.0003)
Installment credit		-0.0393*** (0.0121)	
Transports			-0.4371*** (0.0160)
Electronics			-0.4949*** (0.0243)
Furniture			-0.3930*** (0.0208)
Travel			-0.2601*** (0.0368)
Consumption			-0.6168*** (0.0322)
Adjusted R2	0.0183	0.0185	0.0423
Observations	123,811	123,811	123,811