

How Do Payday Loans Affect Creditworthiness?
Evidence from Matched Payday Applicant-Credit Record Data*

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Abstract

We match payday loan applicants and their payday loan records to ten years of their credit history information to test the effect of payday loan use on subsequent creditworthiness. To identify the effect of payday loan use, we use the credit scoring process of payday lenders in a regression discontinuity design by comparing applicants barely approved for a payday loan with those barely denied access to payday loans. Payday loan applicants are shown to have very weak credit histories and low credit scores both long before and well after their initial application. Our regression discontinuity estimates suggest that the persistence of low scores after application does not differ between “treatment” and “control” groups, that is, between applicants who were approved to borrow and those who applied for but were denied access to payday loans. In other words, payday loans do not improve or worsen the already very poor financial situation of most borrowers. The weakness of payday loan applicants’ credit reports over the ten-year horizon we study indicates that payday loan applicants are generally dealing with persistent liquidity shortfalls rather than responding to a one-time shock.

JEL Codes: D14 (Personal Finance), D12 (Consumer Economics: Empirical Analysis)

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I. Introduction

Many policymakers view payday loans as doing more harm than good. In a public lecture in January 2012, the recently appointed Chief of the new Consumer Financial Protection Bureau, Richard Cordray, stated that “Now, the Bureau will be giving payday lenders much more attention. . . . [The Bureau] recognize[s] the need for emergency credit. At the same time, it is important that these products actually help consumers, rather than harm them.”

Payday loans are controversial largely because of their high interest rates. Finance charges are 10–20 percent for the duration of the loan, typically a week or two, implying annualized percentage rate (APR) in the neighborhood of 500 percent. Despite such fees, between three and ten million American households borrow on payday loans each year, and payday lenders have more storefronts in the United States than do McDonald's and Starbucks combined (Survey of Consumer Finances 2007, Stephens, Inc., 2003).

This paper tests the short- and long-run consequences that borrowing on such expensive loans has for traditional credit scores. We match payday loan applicants and their payday loan records to ten years of their traditional credit history information maintained by Equifax, one of three national consumer credit bureaus. These data give us an unprecedented detailed look at the long-term financial picture of payday loan applicants.

Whether payday loan access hurts or harms consumers is an empirical question. Standard economic theory suggests that consumer credit—even high-interest credit—can increase utility by facilitating consumption-smoothing. Indeed, the payday loan industry asserts that the loans help customers cope with short-term shocks that arise between paychecks. Many have a different view; thirteen states have banned payday lending and nineteen states have banned the process of rolling over a loan.²

Our paper adds to the small but growing body of research attempting to quantify the effects, beneficial or deleterious, payday loans have on consumers. We use a regression discontinuity approach, comparing consumers who have been approved for payday loans to nearly identical consumers who applied for a payday loan but were rejected. The payday data include information on the timing, size, outcome and locations of loans, as well as demographic

² See Skiba (forthcoming) summarizing the various views on payday lending and regulatory responses, and Carter (2012) for an overview of state-level regulation.

information on borrowers and individual identifiers. We use the identifiers to match payday loan applicants to their credit records.

A key institutional feature of the lender's underwriting process allows statistical identification from a discontinuity. With few exceptions, payday loan applications are approved if and only if the applicant's "payday credit score," which is distinct from a traditional credit score such as the FICO score, exceeds a fixed threshold. Our identifying assumption is that, controlling for flexible, smooth functions of the credit score, unobservable characteristics of first-time applicants in the immediate neighborhood of the threshold are similar. If this is true, differences in longer-term credit-record outcomes, such as traditional credit scores, between barely approved and barely rejected applicants can be attributed solely to payday loan access.

Our interest in credit scores as an outcome stems from the way they capture the overall credit history, and thus, at least to some extent, the financial well-being, of a consumer. Moreover, unlike consumers' use of more traditional credit instruments such as credit cards, use of and performance on payday loans does not directly affect traditional credit scores.³ Rather, payday loans can affect one's credit score *indirectly* to the extent that they help or hinder consumers' ability to meet their financial obligations in general. Thus, if temporary shocks are successfully smoothed through payday borrowing, overall creditworthiness may in fact be sustained or improved. Alternatively, behavioral factors, especially self-control problems and overoptimism, imply payday access could decrease creditworthiness and increase the possibility of a downward spiral of falling behind on debt obligations.

Our main findings thus far are two-fold. First, the data reveal that payday loan applicants have persistently very weak credit profiles: 95 percent of payday loan applicants are in the bottom quartile of the population distribution of long-term average credit scores. These results suggest that such consumers suffer from long-term financial problems and permanent cash-flow shortfalls.

Second, our regression discontinuity design shows that the path of traditional credit scores over time following applying for a payday loan for the first time does not differ significantly between those just barely accepted or rejected to borrow on payday loans. These

³ At the time of this writing, payday lenders do not report to the major credit bureaus although many are considering doing so. The subprime credit scores we use as our running variable in the regression discontinuity approach are distinct from FICO scores.

results suggest that access to payday loans does not have large effects (positive or negative) on households' financial well-being.

The rest of the paper is organized as follows. Section II describes our empirical strategy, Section III describes the data, Section IV provides descriptive statistics of our matched sample, Section V provides results on the regression discontinuity estimates and Section VI concludes.

II. Empirical Strategy

This section reports how our regression discontinuity works.⁴ When an applicant enters a payday loan outlet, a credit score specific to payday lending is calculated by a third-party. Scores above a certain threshold result in loan approval. Figure 1 plots the approval rates against the normalized credit score, with the passing score rescaled to zero. The figure (our first stage), shows that we have a strong discontinuity; among the 80.1% of first-time applicants with scores below the threshold, 99.6% were rejected, while 96.9% of first-time applicants scoring above the threshold were approved. The figure includes two quartic polynomials.⁵

Institutional features of the underwriting process further increase our confidence in the research design. First, during the application process, the lender's employee electronically submits information about the applicant to Teletrack, a subprime credit scoring agency, and within minutes, a yes/no notification indicating whether the application was approved or declined is returned to the employee. Neither applicants themselves nor the employees in the store are informed of the applicants' scores or what the passing credit score threshold is. And second, Teletrack uses additional information from other lenders, which is not available to this lender's employees, to compute the score.⁶

Using the credit score discontinuity described in the previous subsection, we estimate the effect of payday loan approval on credit scores over various time horizons (τ) after the first payday loan application. We consider several specifications, but in general we run two-stage least squares where we estimate:

$$CreditScore_i^\tau = \beta_0 + \beta_1 Approved_i + f(PaydayScore_i) + \gamma X_i + \varepsilon_i \quad (1)$$

⁴ The text is heavily borrowed from Skiba and Tobacman (2011), who use the same data and econometric approach.

⁵ Skiba and Tobacman (2012) show detailed regression-coefficients for the first stage and plot the first stage for numerous subpopulations as well. See their Appendix.

⁶ See Agarwal, Skiba and Tobacman (2009) for more on the payday scoring process.

and instrument for *Approved* – a dummy variable indicating whether first-time payday loan applicants were approved – with a dummy variable (*AboveThr*) indicating whether a borrower’s payday-specific score (*PaydayScore*) was above the underwriting threshold. Thus the first-stage equation is:

$$Approved_i = \beta_0 + \beta_1 AboveThr_i + f(PaydayScore_i) + \gamma X_i' + \varepsilon_i \quad (2)$$

The function $f(PaydayScore)$ is a function of the payday underwriting score and X is a vector of demographic and background characteristics. In regression discontinuity parlance, *PaydayScore* is the “running” or selection variable, and our identification assumption is that *AboveThr* is exogenous conditional on our controls for the running variable and other covariates.

Analyses identified off discontinuities generally introduce a tradeoff as more and more data are included around the discontinuity (i.e., as the “bandwidth” increases). The additional data reduce sampling noise, but they potentially add bias as weight is placed on observations where unobservables may be correlated with the outcome. To mitigate these potential problems, we restrict to fairly small subsets of the data, and present results at various bandwidths.

III. Data Sources

We use two types of administrative data. The first is payday loan data at the applicant level from an anonymous provider of financial services. The second is individual-level panel data consisting of credit records maintained by Equifax. We discuss each of these data sources in greater detail below, and then describe our merging process.

III.A. Payday Loan Data

We obtained data on nearly 250,000 payday loan applicants from a provider of financial services that offers payday loans, with applications occurring between September 2000 and August 2004. Along with information on approved and denied applications themselves (principal amount, interest rate, outcome, start date, maturation date, etc.), many details about the individual applicants are available. These include an applicant’s net take-home pay, her checking account balance and demographic data (age, gender and race). Consistent with independent survey evidence on payday borrowers (e.g. Elliehausen and Lawrence 2001), women are slightly

more prevalent than men in our sample, and a large share of the applicants are black or Hispanic. Median annualized individual income is about \$20,000, and the median balance documented on applicants' most recent checking account statement is just \$66 (in January 2002 dollars). A payday credit score, which determines whether a payday loan application is approved or not, is also observed in the data for each applicant. Skiba and Tobacman (2011) provide additional details and summary statistics for these data.

III.B. Federal Reserve Bank of New York Consumer Credit Panel

The Federal Reserve Bank of New York's Consumer Credit Panel (CCP) is a nationally representative, ongoing longitudinal dataset with detailed information on consumer debt and loan performance taken at a quarterly frequency beginning in 1999. Our "primary sample" consists of a five-percent subsample of all individual credit records maintained by Equifax and uses a methodology to ensure that the same individuals can be tracked over time. Each quarter, a random sample of people who are added their credit record database (typically younger people) are added to the sample so that it is representative of the universe of credit records each quarter.⁷

The "full sample" CCP includes quarterly snapshots of the credit records of all individuals living at the same address as the primary sample members. In most cases, the same address implies the same housing unit, but in a nontrivial number of cases, the same address may be associated with hundreds of individuals because, for example, the address is for a large apartment complex and apartment numbers to distinguish housing units are not available. Thus, the full sample is far bigger than the primary sample, numbering almost 40 million people each quarter compared to around 12 million individuals per quarter in the primary sample.

In addition to detailed credit account information provided by banks and financial institutions, the CCP also contains information reported by collection agencies on actions associated with credit accounts as well as non-credit-related bills (for example, phone or hospital bills), and information on inquiries made by consumers for new credit.⁸ Records also contain a

⁷ For more information on the CCP, see Lee and van der Klaauw (2010). It is important to note that all individuals in the data are anonymous: names, street addresses and social security numbers have been suppressed. Individuals are distinguished and can be linked over time through a unique, anonymous consumer identification number assigned by Equifax. As we discuss later, Equifax assisted with matching payday borrowers to the CCP so that the CCP data remain anonymous. The authors do not conduct the match themselves.

⁸ Credit inquiries refer to specific instances where a lender requests a credit report for an individual because that individual is seeking a new credit account. Inquiries do not include instances when lenders pull credit reports without an individual's consent in order to conduct targeted marketing campaigns or perform routine risk

limited number of individual characteristics, including the consumer's year of birth and the geographic code (down to the census block) of the consumer's mailing address.

Finally, a credit risk score is available for most individuals each quarter (at any given quarter, some individuals are not "scoreable" due to a limited credit history).⁹ This score essentially summarizes the information in one's credit report and is based on a model that predicts the likelihood of becoming delinquent by 90 days or more over the next 24 months.¹⁰ The same model is applied to the data over time and thus scores are directly comparable over time. The credit score ranges from 280–850, with a higher score corresponding to lower relative risk.

As noted before, payday lenders do not report on borrowers' activity to the traditional credit bureaus such as Equifax, which means that the use of and performance on payday loans does not directly affect one's traditional credit score in the way a closed-end consumer loan from a bank would. Rather, payday loans can have an indirect effect on one's credit score depending on how they affect consumers' ability to meet their other financial obligations.

III.C. Matching Payday Loan Applicants to Credit Record Data

The CCP has anonymous identification numbers (CCP-IDs) that allow individuals in the data to be linked over time. In order to merge the payday loan applicant data with the CCP data, Equifax transformed the personal identifying information available in the payday loan applicant data into CCP-IDs and then provided the payday loan applicant data, including these CCP-IDs and stripping all personal identifying information, to the Federal Reserve. These data could then be merged to the CCP using the CCP-IDs common to both datasets.¹¹

Table 1 provides summary information about the quality of the matching process. As shown in the top row, the payday loan applicant data consists of 248,523 unique payday loan

management procedures. Inquiries also do not include instances when a consumer requests his own credit report for monitoring purposes.

⁹ The Equifax risk score is similar to the FICO score. For more details, see https://help.equifax.com/app/answers/detail/a_id/244/related/1.

¹⁰ Credit scoring models take into account numerous factors such as the number of delinquent accounts and degree of delinquency, the amount of credit being used on credit card lines, the number and size of collection accounts and recent applications for credit (see https://help.equifax.com/app/answers/detail/a_id/136/noIntercept/1). Factors that are *not* considered include income and employment history.

¹¹ Only select Federal Reserve research staff had access to the merged dataset. At the same time, the original payday loan applicant dataset with personal identifying information has not been made available to Federal Reserve staff; they are held solely by Prof. Skiba (Equifax did not retain a copy). Thus, we have been able to credibly preserve the anonymity of the CCP data.

applicants. Since the primary CCP sample is a five-percent random sample, and since nearly the entire adult population has a credit record (though not all have a credit score), we *expect* to match roughly 12,400 applicants to the CCP.¹² The second row shows that we were able to match 12,151 individuals to the primary sample CCP data at some point in time and follow them for an average of 46 quarters (48 quarters maximum). The third row shows that 11,622 appear in the primary sample in the quarter just before the quarter of their payday loan application. Overall, the matching appears to have been successful and these match results imply that nearly all of our payday loan applicants had a credit record at the time they applied for their first payday loan.

We also matched payday loan applicants to the full sample CCP. Almost 60 percent of applicants were found in the full sample CCP data at some point during the 48 quarters, but most cannot be tracked for that long. Nearly 42,000 applicants were matched to the CCP in the quarter just prior to their first payday application, and these applicants can be tracked for about 26 quarters, on average. The large number of matches to the full sample is somewhat surprising, but is likely due to the fact that payday borrowers predominantly rent rather than own their home, with many applicants living at addresses such as apartment complexes that have large numbers of residents.¹³

IV. Descriptive Credit Record Statistics for Payday Loan Applicants

IV.A. Credit Record Information at the Time of First Application

Table 2 provides credit record statistics for the matched sample as well as for random population samples from the CCP. Panel A provides sample statistics for the matched sample in the quarter prior to the payday loan application (typically 2002:Q4). For comparison, panels B and C display national statistics for the population with a credit record, and statistics for the national subprime population (defined as those with a score below 600), respectively.

¹² Payday borrowers should be captured in the credit record data, as household survey research suggests that payday borrowers also apply for and use traditional forms of credit (credit cards, car loans, etc.) (Elliehausen and Lawrence 2001). In fact, even those without active credit accounts, but who have some type of public record such as a tax lien or a collection account, or have simply applied for mainstream credit, will be in the database. Finally, the fact that payday borrowers must be employed and have a checking account to qualify for a payday loan suggests that there is a good chance that they would have participated in the mainstream credit market at some point and therefore should have a credit record.

¹³ Skiba and Tobacman (2012) show that only about one-third of sample payday loan applicants own their home.

At the time of their first application, prospective payday borrowers appear to be having major financial difficulties based on their credit record information. Their average and median credit scores are below 520, whereas average score in the population is 679; most payday applicants' scores are more than 1.5 standard deviations below the median of the general population. About 60 percent of payday loan applicants have at least one credit card, but their average credit limit is only about \$3,000 and in general they appear to have no available credit on their credit cards. In addition, more than two-thirds of those with a credit card have at least one delinquent credit card account (at least 30 days in arrears).

Moving to the last three rows, about six percent of payday loan applicants went into bankruptcy during the previous 24 months, about three times more than the average, as seen in panel B, and similar to the national subprime population (panel C). Payday loan applicants also had elevated numbers of collection accounts reported in the previous 24 months, as shown in the second-to-last row. Finally, the last row indicates that payday loan applicants had had over five credit inquiries during the previous 12 months – much higher than average and even considerably higher than the national subprime population. In other words, payday loan applicants appear to be actively searching for credit not just in nontraditional markets, but also in traditional markets.

IV.B. Long Term Credit Record Information: Persistent Heterogeneity

As shown in the previous subsection, payday loan applicants appear to be in poor financial condition at the time of application, but we can also explore what their financial health looks like before and well after. Figure 1 shows average scores for payday loan applicants over a 40-quarter window that includes the time of application, using matches to both the full and primary samples. The figure also shows sample sizes over time. The circular data point just before the zero line corresponds to the average score of about 512 shown in the top row of Table 2. Overall, the figure indicates that the average score is consistently very low: under 550.

One potential problem with the full sample is that there may be some confounding compositional changes over time because full-sample applicants are followed for only about 12–13 weeks on average (Table 1). Thus, the 32,794 applicants (with a score) observed in quarter 20 overlap only a slightly with the 38,220 applicants in the quarter just before application. Using only the primary-sample matched applicants (diamonds), whom we can generally follow for

more than 40 quarters, suggests that there are no confounding compositional changes associated with using the full-sample matched data, as the red and blue data points largely mirror one another.¹⁴

Figure 2 shows the distribution of long-term average credit scores for payday loan applicants compared to the general population (that is, individuals' scores averaged over at least a period of 20 quarters between 1999 and 2010). For payday loan applicants, the median long-term score is about 520, and nearly 95 percent of applicants have a long-term score under 600, implying that payday loan applicants – to the extent that our sample is representative of payday borrowers more generally – by and large have long-term financial issues, and do not appear to be simply responding to short-term shocks.

In contrast, the median long-term score in the population is about 700, and about 25 percent of the population has a long-term score below 600. All together, Figure 2 suggests that 95 percent of payday loan applicants are in the bottom quartile of the population distribution of long-term credit scores.

V. The Effect of Access to Payday Loans on Creditworthiness

The previous section showed that individuals who apply for payday loans appear to have persistent financial difficulties. In this section, we test whether short- and long-term outcomes among applicants differ according to whether these individuals actually have access to such loans. Not all applicants can qualify for a payday loan, and although the approval decision is generally endogenous, we rely on the regression discontinuity design discussed earlier where, for a subset of applicants, approval is more or less randomly assigned. In particular, approval is based on whether applicants' payday-specific credit score exceeds a fixed threshold. Since applicants just above and below the threshold should be very similar, approval can be thought of as being randomly assigned in the neighborhood of the threshold.

Table 3 shows simple estimates of the effect of access to payday loans on applicants' traditional credit scores and on several components of credit scores, four and eight quarters after the initial application. The left panel shows means of the outcome variables for applicants below the threshold (largely those who were denied for a loan) at progressively smaller distances to the

¹⁴ The sample size gets considerably smaller at -20 quarters because the CCP data only go back to 1999 and the payday applications were submitted between 2000 and 2004. Thus, only the 2004 applicants will have observations at 20 quarters prior to first application.

threshold starting with one standard deviation of the payday score from the threshold. The right panel is analogous, but shows statistics for applicants above the threshold.

Applicants within one-quarter of a standard deviation from the threshold are the most comparable at the time of their payday application, and despite the difference in access to payday loans, the outcomes of those above the threshold look very similar to those below the threshold, both four quarters and eight quarters out. For example, eight quarters out the average credit score for those just above the threshold was 509, compared to 512 for those just below the threshold.

Table 4 provides instrumental variable estimates of the effect of access to payday loans, or payday loan approval, on credit scores. As discussed earlier, we regress person i 's score τ quarters since her first application on an approval dummy variable and large set of controls, instrumenting approval with a dummy variable indicating whether her payday score exceeded the underwriting threshold (see equations 1 and 2 earlier). The controls include a linear function of the running or selection variable (the payday score) with variable slope on either side of the threshold. We also restrict the sample to those within a distance of one-half of a standard deviation or less from the threshold.

The first super-column shows estimates of the effect on credit scores one quarter after application. There is some indication in the first two columns of panels A and B that credit scores declined slightly after a payday loan was obtained (estimates using the sample within just 0.1 standard deviations of the threshold are generally very imprecise). However, when we control for individuals' pre-application credit score (to be sure, not the same as their payday score) in panels C and D, the estimates fall toward zero and the standard errors also shrink slightly.¹⁵

In the remainder of the table, at various lengths of time after application and regardless of the sample or specification, there is little evidence of any substantive difference in credit scores between applicants who are accepted and rejected. In most cases the point estimates are close to zero with fairly tight standard errors, but in a few specifications (for example, the very last one in the bottom right corner), a substantial longer-term positive effect of up to 35 points cannot be ruled out.

¹⁵ The sample sizes in panels C and D are smaller than in B because some people with a credit record just prior to their payday loan application nevertheless do not have a credit score due to a sparse credit history.

Finally, Figure 4 shows long-term trends in the average credit score for payday loan applicants whose first application was likely to have been accepted (circles), versus those whose first application was likely to have been rejected (diamonds). When we compare applicants within 0.5 or 0.25 standard deviations of the threshold in the bottom two panels (i.e. those applicants that are most comparable), we find that the two lines lie virtually on top of one another, clearly indicating little response (positive or negative) in long-term creditworthiness to getting a payday loan.

VI. Conclusion

In this paper, we use an unprecedented, matched dataset of payday applicants and their 10-year credit history. These data reveal that payday loan applicants have persistently very weak credit profiles – 95 percent of payday loan applicants are in the bottom quartile of the population distribution of long-term average credit scores. These results are more consistent with the notion that such consumers suffer from long-term financial problems and permanent cash-flow shortfalls. In other words, payday lending per se may not be the source of financial distress for the millions of consumers using them, as many policymakers and consumer advocates seem to believe.

We also find, using a regression discontinuity design, that the path of traditional credit scores over time following applying for a payday loan for the first time does not differ significantly between those just barely accepted or rejected to borrow on payday loans. Also, credit score components (e.g. number of recent collection accounts) are also similar for both groups after application. These results suggest that access to payday loans does not have large effects (positive or negative) on households' financial well-being.

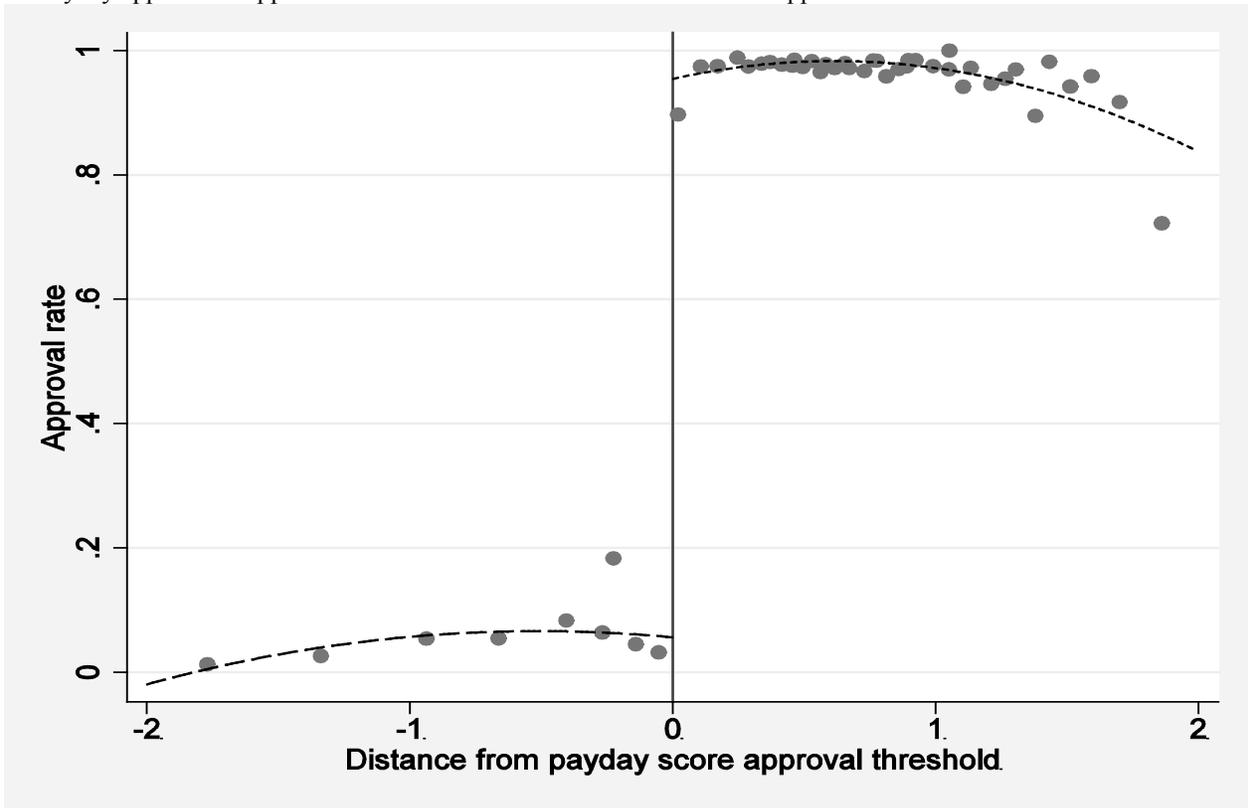
An important potential caveat not yet mentioned is that rejection for a payday loan at this point does not necessarily mean that rejected applicants cannot get a payday loan at another lender or in the near future. However, Skiba and Tobacman (2011) show in previous work using the same payday loan applicant data, rejection of a first-time application is highly predictive of not getting any payday loans from the same company over the next two years.

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1. Payday application approval rate as a function of distance from score approval threshold



Each point represents one of 50 quantiles. Points shown are at the median of their quantiles on the x-axis and at the means of their quantiles on the y-axis.

2. Credit score dynamics of payday applicants before and after first application

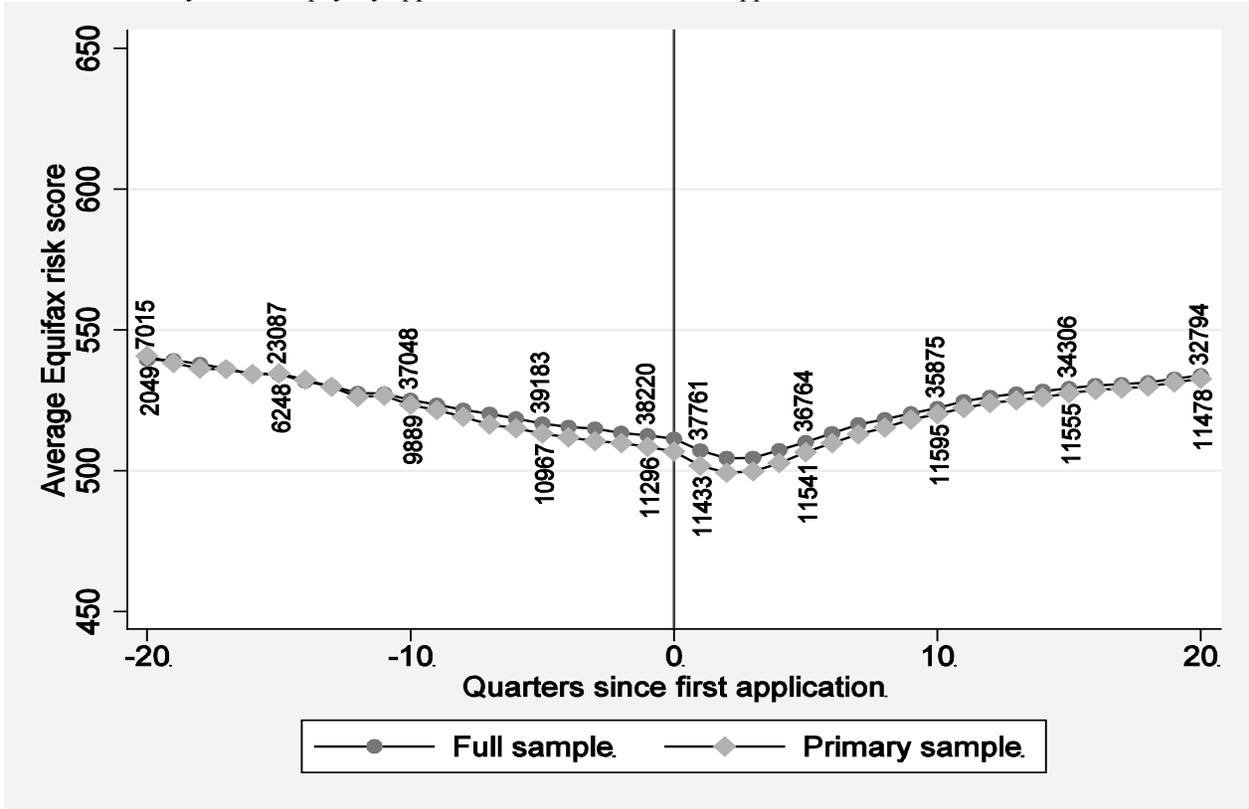
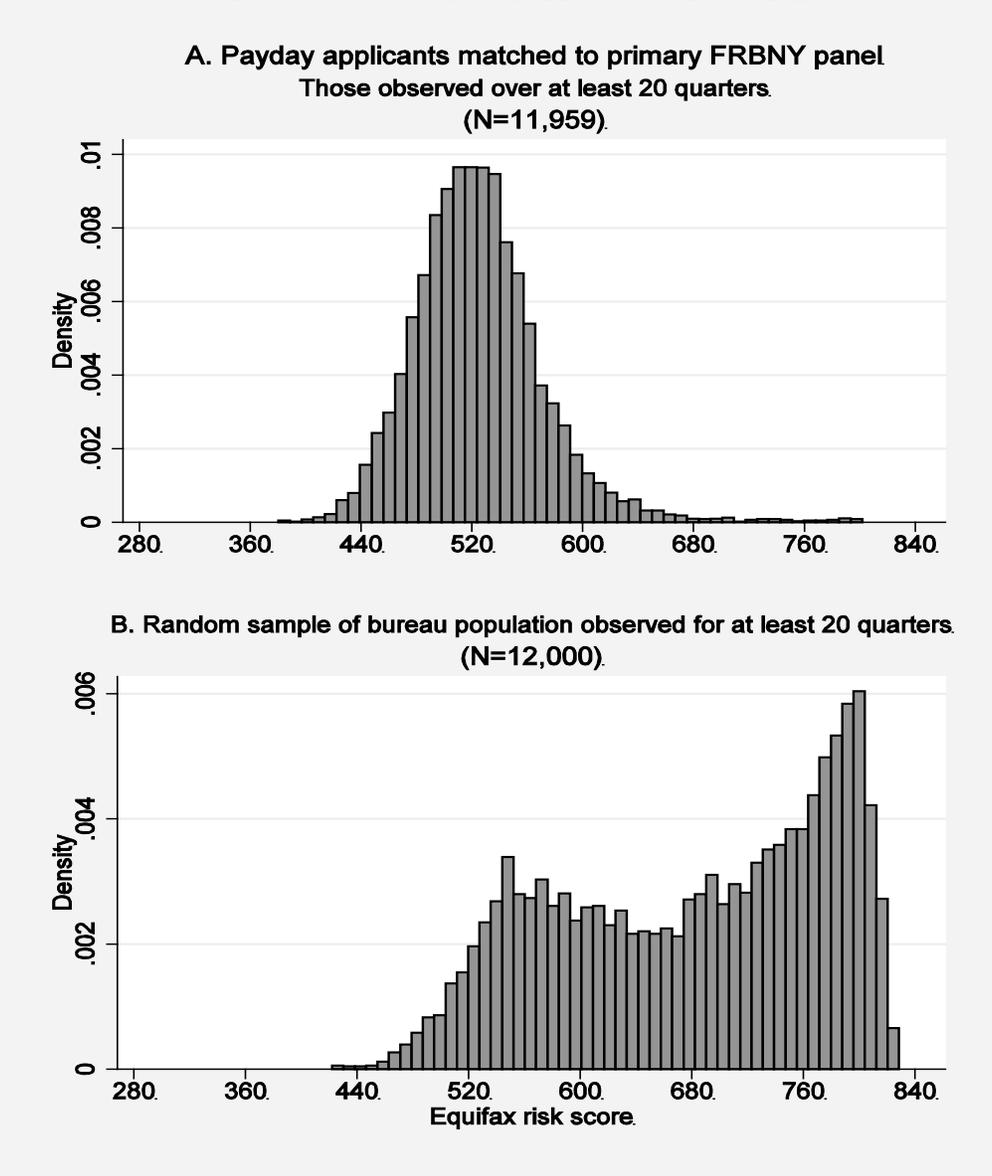


Figure plots credit scores of payday applicants using matched payday applicant-FRBNY/Equifax consumer credit panel data. Each data point represents the average Equifax 3.0 credit score for first-time payday applicants (accepted and rejected applicants) at the end of each quarter before and after their first application. Numbers alongside each data point refer to the number of observations.

3. Distribution of long-term credit scores, payday applicants vs. general population



Panel A represents the distribution of time-averaged Equifax 3.0 credit scores for payday applicants matched to the primary sample FRBNY/Equifax consumer credit panel, limited to those observed for at least 20 quarters between 1999q1 and 2010q4. Panel B represents the distribution of time-averaged scores for a random subsample of the primary sample FRBNY/Equifax consumer credit panel observed for at least 20 quarters between 1999q1 and 2010q4.

4. Credit score dynamics of payday loan applicants before and after first payday loan application, applicants with payday scores above approval threshold vs. those under threshold

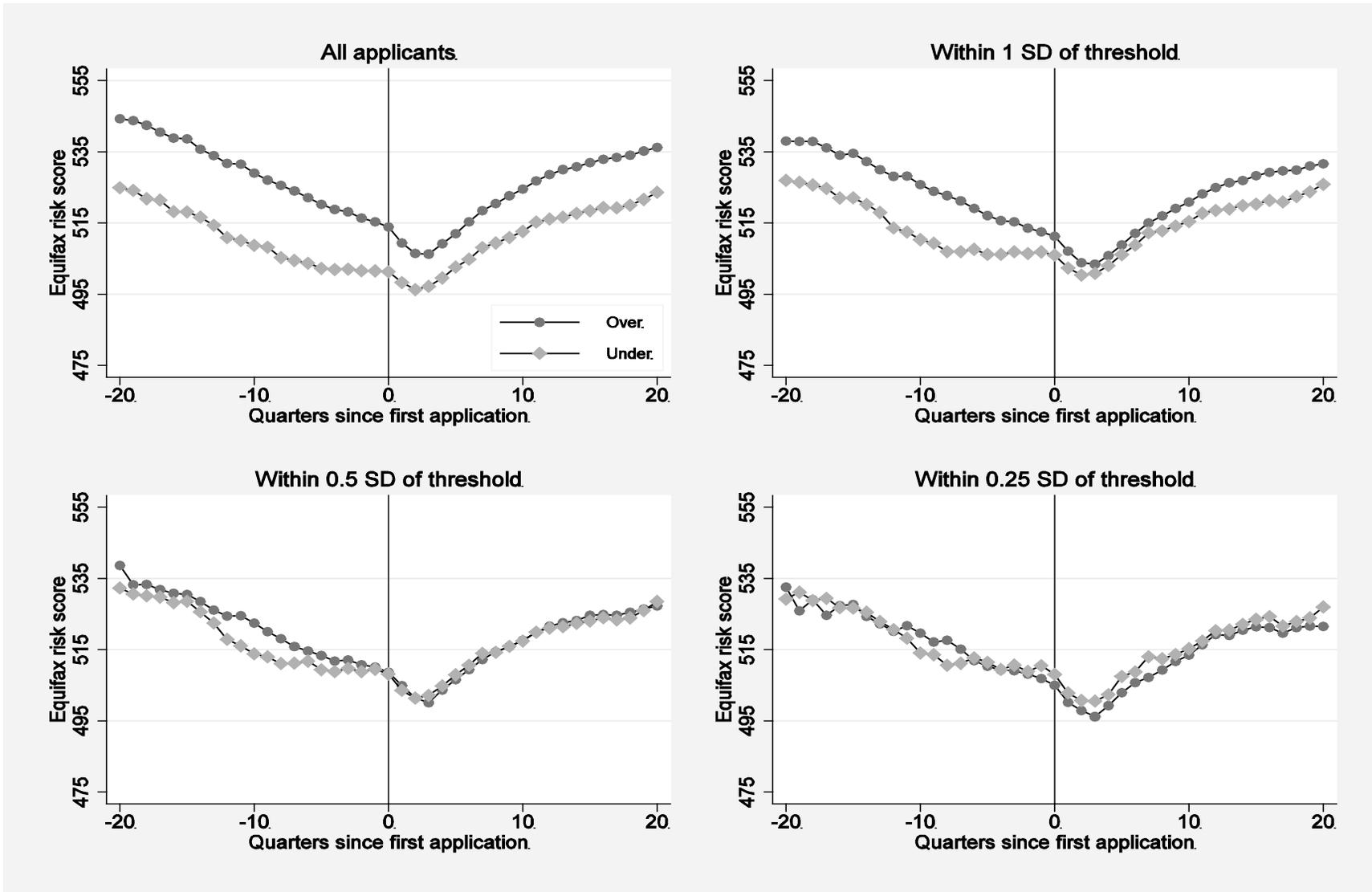


Figure is based on data from the payday applicant data matched to full sample FRBNY/Equifax consumer credit panel. Each data point represents the average Equifax 3.0 credit risk score at the end of each quarter before and after individuals' payday loan first application.

Table 1: Payday applicant data matched to CCP, data match diagnostics

	N	Number of quarters in the panel (max is 48)
Payday applicants	248,523	-
Payday applicants that appear at least once in the 5% primary sample CCP	12,151	45.6
Payday applicants that appear in the 5% primary sample during the quarter prior to the quarter of their first payday loan application	11,622	46.9
Payday applicants that appear at least once in the full sample CCP	146,761	12.6
Payday applicants that appear in the full sample CCP during the quarter prior to the quarter of their first payday loan application	41,948	26.1

Table 2: Summary statistics from the FRBNY/Exquifax consumer credit panel

A. Payday applicants matched to credit bureau data, variables measured as of the end of the quarter prior to the first payday loan application

	<u>mean</u>	<u>median</u>	<u>SD</u>	<u>N</u>
Risk score	512.6	517	76.9	38220
Has at least one credit card	0.59	1	0.49	38286
Credit card credit limit (\$)	3,122.50	1,200.00	6,054.24	22046
Credit card balance (\$)	2,990.37	1,390.00	5,127.66	22046
Has delinquent credit card account (given at least one card)	0.69	1	0.46	22558
Has car loan	0.39	0	0.49	38286
Has delinquent car loan (given at least one car loan)	0.35	0	0.48	15003
Has mortgage	0.14	0	0.35	38286
Has mortgage delinquency (given at least one mortgage)	0.37	0	0.48	5462
Bankruptcy filing in the past 24 months	0.063	0	0.24	40514
Number of collection accounts filed in past 24 months	1.59	1	2.25	40514
Number of credit inquiries in the past 12 months	5.09	4	4.59	40514

B. Random sample of individuals with a credit record as of the end of 2002:Q4

Risk score	679.1	701	108.5	103953
Has at least one credit card	0.74	1	0.44	105080
Credit card credit limit (\$)	18,549.50	11,000.00	25,947.04	77708
Credit card balance (\$)	5,039.76	1,598.00	11,861.99	77708
Has delinquent credit card account (given at least one card)	0.17	0	0.37	78215
Has car loan	0.27	0	0.45	105080
Has delinquent car loan (given at least one car loan)	0.09	0	0.28	28859
Has mortgage	0.32	0	0.47	105080
Has mortgage delinquency (given at least one mortgage)	0.05	0	0.23	34046
Bankruptcy filing in the past 24 months	0.02	0	0.14	107849
Number of collection accounts filed in past 24 months	0.39	0	1.25	107849
Number of credit inquiries in the past 12 months	1.70	1	2.40	107849

C. Random sample of individuals with a credit record and score under 600 as of the end of 2002:Q4

Risk score	522.2	538	60.8	25053
Has at least one credit card	0.65	1	0.48	24742
Credit card credit limit (\$)	5,804.96	2,150.00	10,314.46	15920
Credit card balance (\$)	5,175.07	2,171.00	8,686.56	15920
Has delinquent credit card account (given at least one card)	0.67	1	0.47	16183
Has car loan	0.30	0	0.46	24742
Has delinquent car loan (given at least one car loan)	0.30	0	0.46	7522
Has mortgage	0.19	0	0.40	24742
Has mortgage delinquency (given at least one mortgage)	0.33	0	0.47	4802
Bankruptcy filing in the past 24 months	0.06	0	0.23	25053
Number of collection accounts filed in past 24 months	1.21	0	2.08	25053
Number of credit inquiries in the past 12 months	2.97	2	3.29	25053

Table 3: Univariate measures of the effect of access to payday loans on credit score and several credit scoring factors

	Payday applicants under the approval threshold			Payday applicants above the approval threshold		
	Within 1 SD	Within 0.5 SD	Within 0.25 SD	Within 0.25 SD	Within 0.5 SD	Within 1 SD
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
A. Four quarters after first application						
Risk score	503.04 (71.14)	504.87 (71.64)	502.45 (72.94)	499.30 (72.47)	503.70 (72.75)	505.85 (74.60)
Inquiries in the past 12 months	5.92 (5.30)	5.72 (5.00)	5.71 (5.02)	5.80 (5.06)	5.61 (4.95)	5.47 (4.84)
Credit card balance	2012.72 (3124.96)	2058.61 (2982.27)	2019.42 (2943.22)	2227.66 (3672.21)	2256.13 (3927.24)	2429.54 (3784.76)
Credit card limit	1940.37 (4362.31)	2064.25 (4574.84)	1970.51 (4700.81)	1963.30 (4175.98)	2167.44 (5028.33)	2355.63 (4712.11)
Has delinquent credit card account	0.84 (0.37)	0.83 (0.38)	0.83 (0.38)	0.83 (0.37)	0.81 (0.39)	0.78 (0.41)
Has delinquent car loan account	0.50 (0.50)	0.50 (0.50)	0.50 (0.50)	0.51 (0.50)	0.46 (0.50)	0.42 (0.49)
Has delinquent mortgage account	0.48 (0.50)	0.46 (0.50)	0.47 (0.50)	0.47 (0.50)	0.44 (0.50)	0.44 (0.50)
Collection accounts in past 24 months	2.64 (3.21)	2.53 (3.08)	2.46 (3.03)	2.40 (2.98)	2.22 (2.74)	2.09 (2.66)
B. Eight quarters after first application						
Risk score	512.75 (67.12)	514.18 (67.85)	512.33 (67.54)	509.29 (65.82)	514.38 (66.34)	517.01 (68.26)
Inquiries in the past 12 months	5.16 (4.82)	4.97 (4.62)	5.01 (4.66)	4.83 (4.50)	4.67 (4.33)	4.60 (4.33)
Credit card balance	1833.98 (2803.82)	1821.65 (2925.73)	1912.64 (3450.33)	1889.59 (2553.95)	2035.12 (3549.92)	2194.40 (3371.96)
Credit card limit	1864.41 (5024.48)	1863.23 (4861.80)	1884.08 (5173.37)	1649.67 (3114.86)	1942.92 (4642.56)	2151.15 (4374.79)
Has delinquent credit card account	0.81 (0.39)	0.81 (0.39)	0.81 (0.39)	0.83 (0.38)	0.79 (0.40)	0.77 (0.42)
Has delinquent car loan account	0.50 (0.50)	0.49 (0.50)	0.49 (0.50)	0.49 (0.50)	0.46 (0.50)	0.42 (0.49)
Has delinquent mortgage account	0.50 (0.50)	0.49 (0.50)	0.53 (0.50)	0.52 (0.50)	0.42 (0.49)	0.42 (0.49)
Collection accounts in past 24 months	3.28 (3.78)	3.16 (3.75)	3.14 (3.71)	2.91 (3.56)	2.81 (3.23)	2.64 (3.29)

Based on calculations by authors using payday applicant data matched to primary plus household members sample FRBNY/Equifax consumer credit panel. For each loan product category, statistics are conditional on individuals having at least one such account

Table 4. Instrumental variable estimates of effect of payday loan access on credit score

Range	1 quarter out		4 quarters out		8 quarters out		12 quarters out		
	0.5sd	0.1sd	0.5sd	0.1sd	0.5sd	0.1sd	0.5sd	0.1sd	
appl approved	-9.48** (3.58)	-13.19* (5.16)	-2.76 (3.50)	-3.33 (8.95)	-4.59 (3.26)	-3.48 (4.65)	-4.10 (3.31)	-3.88 (4.75)	-2.10 (8.34)
N	10714	4029	10573	4002	10419	3937	10079	3780	1416
A. All available observations									
appl approved	-9.17* (3.92)	-11.93* (5.70)	-2.99 (4.20)	-0.26 (6.28)	-2.16 (4.23)	-3.38 (6.19)	-3.61 (4.51)	-3.78 (6.55)	1.47 (11.76)
N	8729	3281	7314	2793	6180	2399	5451	2087	814
B. People observed in the Equifax data in the quarter before application									
appl approved	-2.29 (2.82)	-2.07 (4.12)	-0.36 (3.70)	4.01 (5.61)	0.63 (3.92)	0.47 (5.76)	0.77 (4.34)	1.90 (6.29)	8.43 (11.01)
N	8547	3223	7065	2702	5918	2298	5216	2001	782
C. People observed in the Equifax data in the quarter before application; controls for pre-application score									
appl approved	0.38 (3.07)	1.90 (4.47)	3.01 (4.35)	9.95 (6.53)	4.13 (4.89)	6.57 (7.09)	6.32 (5.60)	8.65 (7.98)	10.81 (13.46)
N	8547	3223	7065	2702	5918	2298	5216	2001	782
D. People observed in the Equifax data in the quarter before application; outcome variable is the change in score									

* p < 0.05; ** p < 0.01. Standard errors in parentheses. Outcome variable in all regressions is the Equifax risk score. See estimating equations (1) and (2) in text. Controls include distance from threshold interacted with above threshold, log monthly pay, checking balance, job tenure, age, months in current home, NSF count, pay frequency, garnished wages, direct deposit, home owner, sex, year and quarter dummy variables