

## Chapter 8

# **Pecuniary Mistakes? Payday Borrowing by Credit Union Members**

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*Susan P. Carter, Paige M. Skiba, and Jeremy Tobacman*

This chapter examines how households choose between financial products. We build from three main contexts. First, the realm of options most households face is large and complicated, especially for households with low levels of financial sophistication (Lusardi and Mitchell, 2007, 2009). Lusardi and Tufano (2009) show in particular that people with lower levels of ‘debt literacy’ are more likely to use expensive sources of financing, such as payday loans. This past work invites a search for situations where it appears consumers could make better financial decisions.

Second, we study the context of a category of financial institutions that, as specified in their charters, have the purpose of benefiting their customer-members. Credit unions are not-for-profit financial cooperatives that are governed by their members, who historically had to be united by a ‘common bond of occupation or association, or belong to groups within a well-defined neighborhood, community, or rural district’ according to the Federal Credit Union Act of 1934. In 1935, only about 1 percent of the population belonged to a credit union, but by the end of 2008 there were 7,806 state and federal credit unions in operation with 88.5 million members and \$811 billion of assets. In 2007, total household saving and loans outstanding in credit unions reached \$632 billion and \$527 billion, respectively. The credit union share of outstanding loans is about 4 percent.

Although credit unions have become increasingly important in the past several decades, economists have studied them infrequently. Most of the existing scholarship has focused on competition between credit unions and commercial banks and the effects on the deposit rates of both institutions (Emmons and Schmid, 1999, 2000; Feinberg, 2001, 2002). The other area of focus for research on credit unions has been the effects of credit union governance rules (Davis, 2001) and consolidation of credit unions through mergers and acquisitions (Goddard et al., 2009). The two studies closest to ours study consumer financial decision-making and credit unions. Rauterkus and Ramamonjjarivelo (2010) analyze the determinants of credit union deposits, and Bubb and Kaufman (2009) explain theoretically

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and empirically why consumers may often receive better terms on financial products from credit unions than from for-profit financial institutions.

Third, with this chapter we seek to interface with the literature on the ‘liquid debt puzzle’. This term refers to the observation that many debtor households in fact have low-interest paying liquid assets which they could use, at least in part, to pay off higher-interest debt. Gross and Souleles (2002) found, ‘over 90 percent of people with credit card debt have some very liquid assets in checking and saving accounts, which yield at most 1 to 2 percent’. Not all authors consider this fact pattern puzzling, and Zinman (2007) provides a particularly careful treatment of explanations for ‘borrowing high and lending low’ that are consistent with rational choice models. Our view is that the probability a liquid debt puzzle is really present and is increasing with the size of the interest losses. In this chapter, we describe borrowing high and lending low as a ‘pecuniary mistake’ and we try to measure its size, while reserving judgment about whether ‘rationality’ can generate the behavior.

A variety of alternative decision-making perspectives are consistent with the presence of ‘pecuniary mistakes’. Lusardi (2007) points out that mistakes in financial planning are not rare, and that without proper financial guidance, individuals may routinely fail to save enough for retirement, invest in assets that are too risky or too conservative, and not take advantage of what the employer matches. These points emphasize that an individual’s level of financial literacy is associated with the types of sources he/she relies on for advice, and more broadly with how efficiently he/she manages his/her financial resources.

Other sources of information about ‘liquid debt puzzles’ and payday loans include the following. First, the 2008 Survey of Consumer Finances found that one-third of payday borrowers had been denied some type of loan within the past five years, compared to one-tenth of non-payday borrowers (Logan and Weller, 2009). Second, Agarwal et al. (2009) perform a similar study to ours using matched administrative datasets of credit cards and payday loans. They find that people took out payday loans when liquidity on their credit card was still available at a lower interest rate. Specifically, average interest losses in their study were \$200 over a three-year period. Quantitatively, those results resemble our finding here of an average of \$88 in interest losses during an observation period of six-and-a-half months. In this chapter, we include checking account balances, in addition to alternative sources of loans, which likely is causing our results to be even higher.

In this chapter, we introduce a new administrative credit union dataset, provide some new evidence from it on basic transaction patterns, report our findings on ‘pecuniary mistakes’, and briefly discuss our results and conclusions.

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### **Credit union dataset**

We conduct our analysis using a proprietary transaction-level dataset from a credit union with more than half a million members. In the case of this particular credit union, access is restricted to people living in the region where the credit union operates and to people working for a particular company that sponsors the credit union. Historically, credit unions—which are not-for-profit—have accepted restrictions on membership in exchange for tax-exempt status.

The dataset includes a population of 3,845 members who had an electronic debit to a payday lender during our observation period (January 1, 2006 to June 14, 2006), plus a representative random sample of 12,467 other credit union members who do not borrow from the payday lender. Of this sample, we restrict the data to the 15,478 members who were in the dataset for the whole time period.

For all credit union members in the sample, we have information on the dates and amounts of credits and debits in their checking, saving, and line of credit accounts during the period of observation. A total of 2.75 million transactions are included, representing an average of about one per member per day. The dataset also includes information on members' initial balances, allowing computation of balances and available liquidity at any point in time. In addition, we observe members' Fair Isaac Corporation (FICO) scores on January 11, 2006 and March 26, 2006, and internal customer scores assigned to them by the credit union at the time of the most recent application for credit. Finally, the dataset flags electronic debits to the local market-leading payday lender.

### **Transaction patterns and credit scores of payday borrowers**

Table 8.1 shows summary statistics for both the representative random sample and for the payday borrowers in our dataset. The FICO scores (pulled on January 11, 2006 and March 26, 2006) are lower for payday borrowers. Additionally, payday borrowers tend to have a decrease in their FICO scores from January 11 to March 26, while the change in credit score of nonpayday borrowers is quite small. This result could suggest that payday borrowers are having financial troubles that cause them to not pay their debts (lowering their score), or that payday borrowers, in general, make poor choices that lead to lower scores.

Table 8.1 also reports a high frequency of transactions made by payday borrowers. Over the whole sample period, payday borrowers made an average of 364 total transactions, relative to 123 made by the random

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TABLE 8.1 Summary statistics

	Credit union representative sample	Credit union payday borrowers
FICO 1/11/2006	720 (83.3)	584 (84.7)
FICO 3/26/2006	720 (68.0)	581 (69.5)
Percent above low CU score threshold	96	76
Provide above high CU score threshold	82	31
Total number of transactions	123 (167)	364 (199)
Number of checking transactions	105 (159)	338 (192)
Mean absolute checking transactions (\$)	295 (627)	145 (86.7)
Average number of payday loans	0	3.28 (2.69)
Average payday loan amount (\$)	0	449 (220)
Average payday loan interest paid (\$)	0	175 (171)
Total liquidity on 1/1/2006 (\$)	6,529 (22,469)	832 (2,434)
<i>N</i>	11,824	3,654

*Notes:* Summary statistics for a representative sample of members of the credit union and for the population of members who had an electronic payment to a payday lender during the observation period (1/1/2006–6/14/2006). Standard deviations are in parentheses. The CU score thresholds affected access to credit from the credit union and affected the interest rate. All differences between columns are significant at the 1 percent level.

*Source:* Authors' calculations based on administrative data from a credit union; see text.

sample. The cause of this previously undocumented fact remains unclear. One hypothesis is that payday borrowers have fewer accounts outside this credit union, and hence use these accounts more. Alleviating financial stress may be more challenging to the extent stressed households create costs for financial institutions by making more transactions of small dollar amounts.

### **Pecuniary mistakes?**

Previous papers have shown that people often make pecuniary mistakes by taking out more expensive loans when cheaper substitutes are available. With access to information on the amounts available in customers' lines of credit, checking accounts, and saving accounts, we can determine whether they could have reduced their interest rates by borrowing elsewhere, or whether they could have avoided borrowing altogether. Our estimates are a lower bound because we lack information on other loan options available to the payday borrower (such as liquidity on a credit card).

To find the amount available to customers in their Line of Credit (LOC) on any given day, we first took the LOC limit given on January 1 and April 1. Then, by calculating the running balance of LOC (determined by the initial balance

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on January 1 minus any credits to the LOC and plus any debits), we found the LOC available on any day to be the LOC limit minus the LOC balance. Some people in the dataset have a zero LOC limit on January 1 but a positive LOC balance. These people had their account closed and were just paying off their balance. Based on the January 1 and April 1 LOC limits, 70.1 percent of payday borrowers have a zero LOC limit. In a similar fashion to the line of credit, to find checking and saving account levels, we used the initial balance on January 1 and added or subtracted debits or credits made to the account over time.

We inferred the amount of a customer's payday loan from the repayment amount (which is known from the electronic debit) and the interest rate (which is fixed here by state law). We then estimated interest losses using a maximally conservative method.

We computed minimum levels of liquidity from LOCs, checking accounts, and saving amounts between payday loan repayments. We then compared the estimated payday loan amount to the amount available in each of the consumer's accounts, and total liquidity combined across accounts. Assuming that consumers take out payday loans when their accounts were at a minimum gives a lower bound for the percent of 'mistakes' made.

Figure 8.1 illustrates the dynamics of an individual's checking, line of credit, and saving accounts from fifty-six days before to fifty-six days after the first payday loan repayment was made (for the sample of payday loan borrowers who took out their first payday loan between February 23 and April 18, 2006). Checking account balances start to rise five days before the payday loan repayment. The checking account balance then begins to fall, starting on the day the payday loan repayment was made and continues to fall until about ten days afterward. The typical payday borrower makes deposits several days in advance in order to cover payday loan repayments, but then checking account balances continues to fall for days after the payment, before leveling off again. Their LOC available balance and saving balance remain steady but are continuously rising throughout the time period.

To estimate the interest losses from not using a line of credit, we first need to estimate the alternative interest rate from using money from a member's checking account or line of credit. We restrict the length of loan to be forty-five days, which is the maximum length a person can take out a payday loan in this state, and estimate what the interest payment would be if the borrower used line of credit instead of a payday loan; in other words, if a payday borrower took out a payday loan during this time period, we make his/her alternative option (taking out a line of credit or using a checking account balance) to be as expensive as possible. We add up all available balances in the borrower's account on the day of his/her minimum balance and compare it to the estimated payday loan. If a borrower had \$100 in his/her accounts while taking out a \$200 payday loan, then his/her

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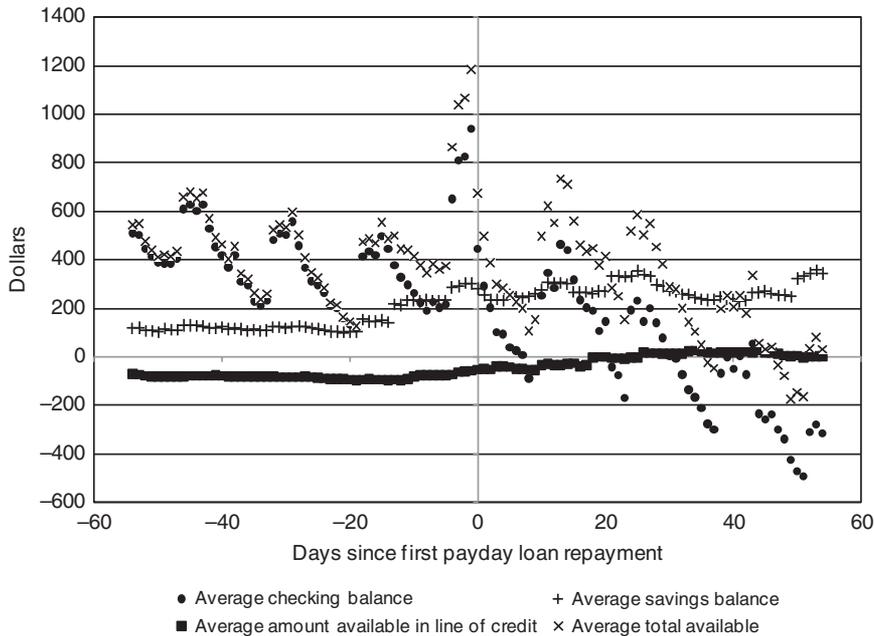


Figure 8.1 Liquidity over time

*Notes:* This figure reports the evolution of several forms of household liquidity around the time of credit union members’ first observed payday loan repayments. We restrict the sample to individuals who are observed for fifty-four days before and fifty-four days after the repayment (i.e., to individuals whose first repayments occurred between 2/23/2006 and 4/18/2006).

*Source:* Authors’ calculations based on administrative data from a credit union; see text.

loss would be the 100 dollars times the interest payment on a line of credit for forty-five days. Using this method, we find the average loss per payday loan borrower to be \$87.91 over the six-and-a-half month period. The spread of losses is depicted in Figure 8.2.

We next consider what characteristics predict these pecuniary ‘mistakes’. In Table 8.2 we regress the losses for credit union members on characteristics of the borrower that were known at the beginning of the period (FICO scores, checking, savings, line of credit, and VISA balances and availability) using OLS. In Columns 1 and 2, we run regressions restricting the sample to people who take out at least one payday loan. Not surprisingly, people with lower FICO scores are more likely to make losses. Interestingly, borrowers with higher checking account balances on January 1 are more likely to make more losses, while people with greater LOC balances on

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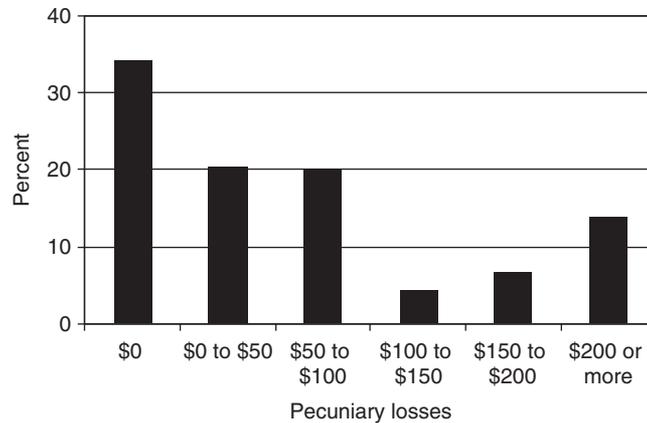


Figure 8.2 Histogram of pecuniary losses

*Notes:* Losses incurred from use of payday loans instead of other liquidity from 1/1/2006 to 6/14/2006.

*Source:* Authors' calculations based on administrative data from a credit union; see text.

January 1 also make more losses. In Columns 3 and 4 we include the random sample of credit union members and weight the sample to represent all members at the credit union at this time. Nonpayday loan borrowers have zero losses from payday borrowing. As before, we find that members with lower FICO scores and higher line of credit balances on January 1 are more likely to have greater losses. Checking account balance is no longer significant. Line of credit and VISA account limits (as well as availability) in January are significant predictors of losses; however, the line of credit limit is significantly negative, while the VISA limit is positive. The magnitude of the effects are, however, close to zero.

Finally, we study the impact that access to credit outside payday lending has on an individual's decision to take out a payday loan. In Figure 8.3, we plot the number of payday loans taken out over this time period on the credit scores (represented on the graph as the standard deviation of the credit score and centered around the credit score mean). As one can see in the graph, the number of payday loans is approximately level at lower credit scores, but starts to fall as credit scores get even higher. We use a regression discontinuity approach to estimate whether a cut-off for line of credit interest rates significantly impact the number of payday loans used. If there is a significant change at the credit score cut-off, it would indicate that the mere access to the credit is causing a jump in the number of payday loans. Our results indicate some evidence that at the first cut-off for a change in interest rates there is a significant change in the slope and

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TABLE 8.2 Predictors of pecuniary losses from payday borrowing

	Column 1	Column 2	Column 3	Column 4
FICO 1/11/2006	-0.17*** 0.038	-0.17*** 0.038	-0.016*** 0.00072	-0.016*** 0.00072
Check balance 1/1/2006	0.0039*** 0.0011	0.0039*** 0.0011	0.0000019 0.0000015	0.0000019 0.0000015
Savings balance 1/1/2006	0.00098 0.0025	0.0010 0.0025	0.0000028*** 0.00000064	0.0000028*** 0.00000064
LOC balance 1/1/2006	0.0078*** 0.0025	0.0079*** 0.0010	0.00024*** 0.000033	0.00020*** 0.000030
LOC limit 1/1/2006	0.000062 0.0026		-0.000038*** 0.0000058	
VISA balance 1/1/2006	-0.0015 0.0032	0.0015 0.0014	-0.000024 0.000015	-0.0000040 0.000013
VISA limit 1/1/2006	0.0031 0.0028		0.000020*** 0.0000029	
LOC available 1/1/2006		0.0001 0.0026		-0.000038*** 0.0000058
VISA available 1/1/2006		0.0031 0.0028		0.000020*** 0.0000029
Constant	176.15*** 22.20	176.15*** 22.20	12.38*** 0.54	12.38*** 0.54
<i>N</i>	3,238	3,238	12,894	12,894
Adjusted <i>R</i> <sup>2</sup>	0.027	0.027	0.0075	0.0075

*Notes:* By regressing losses from using payday loans on initial characteristics, Table 8.2 identifies predictors of pecuniary mistakes. Columns 1 and 2 include only people who took out payday loans between 1/1/2006 and 6/14/2006, while Columns 3 and 4 include payday loan borrowers and the random sample of credit union members, weighted to represent the entire population of members at the credit union. Standard errors are reported below the coefficients. \*\*\* Indicates significance at the 1 percent level.

*Source:* Authors' calculations based on administrative data from a credit union; see text.

level of payday loans. These results are expanded more in the Appendix to the chapter, and they begin to explore the impact that access to liquidity elsewhere has on the use of payday loans.

### Conclusion

This chapter highlights several characteristics about payday borrowers associated with making pecuniary mistakes. First, payday borrowers had lower credit scores and their scores were falling over the time. Second, payday borrowers made almost three times as many transactions as nonpayday borrowers, and payday borrowers' typical transaction sizes are half as large as nonpayday borrowers' transaction sizes. Third, payday borrowers accumulated checking account liquidity in order to repay their payday loans.

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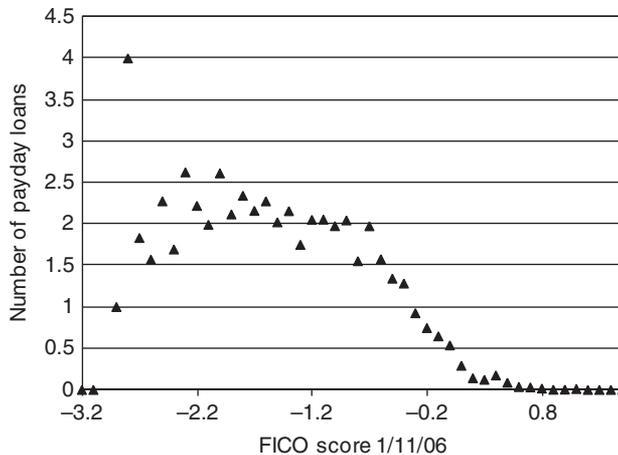


Figure 8.3 Payday borrowing as a function of credit scores

*Notes:* Displays the relationship between FICO scores on 1/11/2006 and the number of payday loans taken out between that date and 6/14/2006. The FICO scores are centered around the credit score mean and are represented in standard deviations of the score. Each point represents the average number of payday loans in a bin, where the bins have width equal to one-tenth of a standard deviation.

*Source:* Authors' calculations based on administrative data from a credit union; see text.

Comparing estimated payday loan amounts to liquidity available in the borrowers' checking accounts, saving accounts, and lines of credit, we estimated losses incurred by using a payday loan rather than money available in the other accounts. These losses amounted to around \$88 during the six-and-a-half month period.

This chapter has focused on a group of borrowers—payday loan borrowers with credit union accounts—that would significantly benefit by making better financial decisions. Further work will investigate how credit scores influence access to liquidity, the impact of such access on payday borrowing and interest losses, and strategies that credit unions and others can use to help consumers make good financial decisions.

## Appendix

The credit union uses external and internal credit scores, as well as other information, to determine who receives a line of credit and at what interest rate. We know the basic external credit score cut-offs for interest rates on a

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line of credit used at this credit union. Given a member's FICO score, we can therefore estimate what level of interest payments the individual would have to pay. Referring back to Figure 8.3, we can see that there is a continual decline in the number of payday loans taken out as credit scores reach a certain level. Using a regression discontinuity approach, we study whether access to a line of credit at a lower interest rate causes a decrease in the number of payday loans used. In simple terms, a regression discontinuity examines people who have similar credit scores, but some are below the cut-off and some are above the cut-off. Through the regression, we can determine whether the credit score or the access to lower interest rates is causing a difference in the use of payday loans.

We must first check whether there is a clustering of credit scores above or below the cut-off; we, therefore, look at the density of credit scores in Appendix Figure 8A.1. If there are jumps around the credit score cut-off, it may indicate that something else, not the interest rate access, is causing

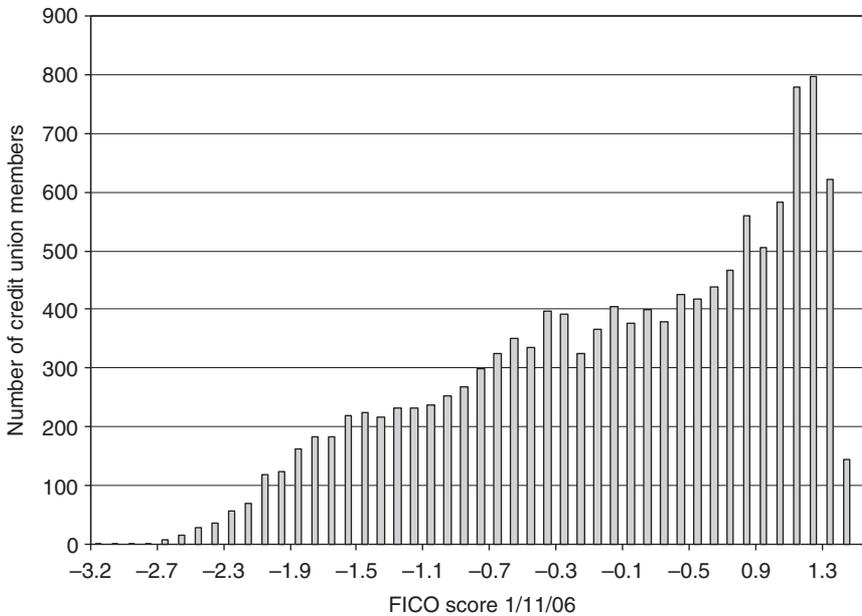


Figure 8A.1 Distribution of credit union members' credit score

*Notes:* Displays the distribution of credit union members' 1/11/2006 normalized FICO scores. The scores are centered around the FICO 1/11/2006 mean and divided by the 1/11/2006 standard deviation.

*Source:* Authors' calculations based on administrative data from a credit union; see text.

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TABLE 8A.1 Regression discontinuity

	Column 1	Column 2	Column 3	Column 4
AboveThr	0.069*** 0.0037	0.052*** 0.0038	0.017*** 0.0050	0.0060 0.0066
BelowThr	0.36*** 0.089	-1.44* 0.74	-9.50** 4.71	22.38 37.94
FICO_Above	0.00000470*** 0.00000031	0.00016*** 0.000010	0.0030*** 0.00031	0.017*** 0.0038
FICO_Below	-0.00037** 0.00016	0.0065** 0.0028	0.054* 0.028	-0.21 0.31
FICO_Above <sup>2</sup>		- 0.00000020***	-0.0000077***	-0.000068***
FICO_Below <sup>2</sup>		0.00000013 -0.0000066** 0.0000027	0.0000081 -0.00010* 0.000057	0.000015 0.00069 0.00096
FICO_Above <sup>3</sup>			0.000000050*** 0.0000000054	0.00000088*** 0.00000020
FICO_Below <sup>3</sup>			0.000000061 0.000000038	-0.0000010 0.0000013
FICO_Above <sup>4</sup>				- 0.00000000038***
FICO_Below <sup>4</sup>				0.000000000091 0.00000000052 0.00000000066
N	12,894	12,894	12,894	12,894
Adjusted R <sup>2</sup>	0.021	0.022	0.022	0.022

*Notes:* Regression of the number of payday loans taken out after 1/11/2006 and before 6/14/2006. AboveThr (BelowThr) is a dummy indicating that the credit score is above (below) the cut-off. FICO\_Above (FICO\_Below) is the FICO score for an individual above (below) the cut-off point. We use a linear, squared, cubed, and quartic function of the credit score. The regressions are weighted to represent all the members at the credit union. \*\*\*, \*\*, and \* represent significance at the 1 percent, 5 percent, and 10 percent level, respectively.

*Source:* Authors' calculations based on administrative data from a credit union; see text.

more payday loans. There do not, however, appear to be any significant jumps.

We use the following regression specification to test whether there are significant changes around the cut-off point:

$$\text{NumberPDL}_i = \beta_1 \text{AboveThr}_i + \beta_2 \text{BelowThr}_i + f(\text{FICO\_Above}_i) + f(\text{FICO\_Below}_i) + \epsilon_i$$

where  $f(\cdot)$  is a function of the credit score. NumberPDLs is the number of payday loans during our sample, but after the FICO score reported on January 11. AboveThr (BelowThr) is a dummy indicating that the credit

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score is above (below) the cut-off. FICO\_Above (FICO\_Below) is the FICO score for an individual above (below) the cut-off point. We use a linear, squared, cubed, and quartic function of the credit score. The regressions are weighted to represent all the members at the credit union at this time.

The results from these regressions are shown in Appendix Table 8A.1. The dummies for before and after the threshold are both significant in the first three columns; however, surprisingly, the dummy for below the threshold is negative in Columns 2 and 3, indicating that people below the threshold are less likely to take out payday loans. Additional tests (not shown) find that the levels and slopes for above and below the threshold are significantly different in all specification, except when quartic FICO scores are used. Similar results are found when using the number of payday loans repaid after the FICO score reported on March 26.

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