Evidence for Pecuniary Mistakes?

Payday Borrowing by Credit Union Members

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Abstract

This paper examines patterns of financial choices by a credit union's members using transaction-level administrative data on checking, savings, and line-of-credit accounts. First, we show that payday loan use declines as a function of prime credit access. As FICO scores rise from 600 to 700, mean payday loan use falls from 2 to 0. However, substantial payday loan use occurs when cheaper sources of liquidity are available, resulting in average interest losses of $88 over a 5.5 month period. In addition, we find much higher levels of transaction activity by payday borrowing members than by other members, at half the average transaction dollar magnitude. These results are consistent with previous work identifying financial stress and decision-making challenges for payday borrowers.

Many papers on household financial choices assume that households respond only to the risk-adjusted financial costs and benefits of financial products. However, a variety of non-financial considerations like convenience and trust also affect financial choices. We use the term 'pecuniary mistake' to describe a choice where the known financial costs exceed the known financial benefits. This paper measures the pecuniary mistakes detectable in a new administrative dataset from a credit union, and then seeks to understand their origins.

One important candidate explanation for pecuniary mistakes is financial illiteracy. The realm of financial options most households face is large enough to be complicated, especially for households with low levels of financial sophistication (Lusardi and Mitchell 2006, 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 like payday loans.

Relatedly, a number of authors beginning with Gross and Souleles (2002) have found that many debtor households have liquid assets bearing low interest rates which could be used, at least in part, to pay off higher-interest rate debt. This fact has been called a 'liquid debt puzzle.' Like Zinman (2007), we perceive many explanations for such 'borrowing high and lending low' that are consistent with rational choice models. The current paper describes all examples of borrowing high and lending low as 'pecuniary mistakes,' and measures their size in a new context. To the extent the magnitudes of pecuniary mistakes are large, then it is more likely financial illiteracy or behavioral biases are compromising consumers' financial decisions.

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, Skiba, and Tobacman (2009) perform a similar study to ours using matched administrative datasets of credit cards and payday loans. They find that many people took out payday loans when liquidity on their credit cards was still available at a lower interest rate. Average interest losses in their study amounted to roughly $200 over a two-year period. Quantitatively, those results are comparable to our finding here of an average of $88 in interest losses during an observation period of 5.5 months. Our inclusion of checking account balances, in addition to alternative sources of loans, could explain at least in part why our results are larger per unit time.

Our paper proceeds as follows. Section 2 introduces the administrative credit union data for the study. Section 3 reports our findings on 'pecuniary mistakes.' Section 4 discusses possible explanations for the observed magnitude of pecuniary mistakes including some new evidence on transaction rates, and Section 5 concludes.

Administrative Credit Union Dataset

Our study proceeds using data from a credit union. 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' (Federal Credit Union Act of 1934). In 1935, only about one 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 savings and loans outstanding in credit unions reached $632 billion and $527 billion, respectively. Nationwide, the credit union share of outstanding loans is about four 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). Closer to our study, Rauterkus and Ramamonjiarivelo (2010) analyze the determinants of credit union deposits, and Bubb and Kaufman (2009) explain theoretically and empirically why consumers may often receive better terms on financial products from credit unions than from for-profit financial institutions.

Our analysis uses a new, transaction-level dataset from a credit union with more than a half-million members who are linked by employer and geography. The dataset includes the 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 did not make payments to the payday lender via electronic debit. Of the combined sample, we restrict to the 15,478 members who were in the dataset for the whole observation period.

The dataset includes all dates and amounts of credits and debits in checking, savings, and line of credit accounts. The total of 2.75 million transactions represents an average of about one per included member per day. The dataset also includes information on members' initial balances, allowing computation of balances and available liquidity at any point in time during the observation period. In addition, we observe members' FICO scores on January 11, 2006, and March 26, 2006, and internal customer scores calculated by the credit union at the time of the most recent application for credit. Finally, the dataset identifies checking account debits that were paid to the local market-dominating payday lender.

Table 1 reports summary statistics for the representative random sample and for the payday borrowers. Payday borrowers exhibit more financial distress, for example by having FICO scores that are lower by 1.5 standard deviations.

Insert Table 1 here.

The Magnitude of Pecuniary Mistakes

Previous papers have shown that people often make pecuniary mistakes by using expensive forms of credit when cheaper substitutes are available. With access to information on the amounts available in customers' lines of credit, checking accounts, and savings accounts, we can determine whether they could have reduced their interest costs by borrowing elsewhere, or whether they could have avoided borrowing altogether. Our calculations provide a lower bound on pecuniary mistakes 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 a customer in her line-of-credit (LOC) on any given day, we first take the LOC limit given on January 1 and April 1. Then, by calculating the running balance of LOC (determined by the initial balance on January 1 minus any credits to the LOC and plus any debits), we find 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 accounts closed and were just paying off their balances. 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 savings account liquidity, we use the initial balance on January 1 and add or subtract any debits or credits made to the account over time.

We infer 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 estimate interest losses using a maximally conservative method. Specifically, we compute minimum levels of liquidity from LOCs, checking accounts, and savings accounts between payday loan repayments. We then compare the payday loan amount to the amount available in each of the consumer's accounts, and total liquidity combined across accounts. Assuming that the consumer took out the payday loan when her accounts were at a minimum gives a lower bound for the frequency and size of 'mistakes.'

Figure 1 illustrates the dynamics of mean liquidity from 54 days before to 54 days after the first payday loan repayment was made (the longest symmetric window available given our data). Most importantly, mean liquidity is positive and substantial during the entire two weeks before the payday loan is repaid. Savings account balances trend

slightly upward during that timespan; LOC liquidity is slightly negative but quite flat; and checking liquidity is volatile because of variation over the pay cycle but always at least $150.

Checking account balances start to rise 5 days before the payday loan repayment. The checking account balance then begins to fall starting on the day the payday loan repayment is made and continues to fall until about 10 days afterward. The typical payday borrower makes deposits several days in advance, presumably reflecting payday lenders' incentives to make loans due just after paychecks are received.

Insert Figure 1 Here

To estimate the interest losses from payday borrowing, we first need to infer the alternative interest rate, corresponding to use of funds from a member's checking account, savings account, or LOC. We restrict the length of the payday loan to be 45 days, which is the maximum payday loan duration in this state. Conservatively, we assume that if a payday borrower instead used alternative liquidity during the period the payday loan was outstanding, he or she would have used the most expensive alternative option (i.e., borrowing on the LOC, rather than using checking or savings balances). We add all available balances in the borrower's accounts on the day of his or her minimum balance and compare it to the payday loan. If a borrower had $100 in liquidity while taking out a larger payday loan, then his or her loss would be the difference between the interest on a $100 payday loan and $100 of usage of a LOC for 45 days. Using this method, we find the average loss per payday borrower to be $87.91 over the 5.5 month period. In our terminology, these losses are pecuniary mistakes, and their distribution is depicted in Figure 2.

We next consider what characteristics predict pecuniary mistakes. In Table 2 we regress the losses for credit union members on financial characteristics that were known at the beginning of the period (FICO scores, and balances and liquidity available in checking, savings, and LOC, and VISA accounts in thousands of dollars). In Columns 1-2 we run the regression for people who take out at least one payday loan. People with lower FICO scores are more likely to incur pecuniary losses, as are borrowers with higher checking account and LOC balances on January 1. In Columns 3-4 we include all credit union members in the dataset and weight the sample to represent all credit union members at this time. Non-payday borrowers have zero losses from payday borrowing. As before, we find that people with lower FICO scores and higher LOC balances on January 1 have greater losses. Checking account balance is no longer significant. LOC and VISA account limits on January 1 are significant predictors of losses; however, the LOC limit is significantly negative while the VISA limit is positive.

Finally, we study how access to credit outside of a payday lender influences an individual's decision to take out a payday loan. In Figure 3 we plot the number of payday loans taken out from January 11, 2006, to the end of the observation period against the FICO score on January 11. Vertical lines are included at FICO scores of 600 and 700, as is a piecewise-linear fit with breaks at those FICO scores.

Payday borrowing declines in the FICO score, but most of the decline occurs between scores of 600 and 700. Qualitatively, access to other (prime) credit is generally thought to expand as FICO scores rise above 600, potentially leading to substitution away from payday loans. Payday borrowing is almost entirely absent among credit union members with scores above 700. Formal tests (not reported) support the presence of kinks in payday borrowing at FICO thresholds of 600 and 700. Table 3 reports the regressions than underlie the piecewise-linear fit in Figure 3.

Insert Figure 3 here.

Insert Table 3 here.

One other feature of the credit union data speaks in a novel way to the payday borrowing/financial literacy nexus. The bottom few rows of Table 1 report a high intensity of transactions by payday borrowers. Over the 5.5 month observation period, payday borrowers made an average of 364 transactions, three times more than members of the credit union random sample. Moreover, the average payday borrower transaction was half as large in dollar terms as the average transaction by a non-payday borrower.

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 amounts.

Conclusion

In this paper, we have highlighted a number of interesting facts using new credit union data, with a focus on behavior like large pecuniary mistakes by payday borrowers that may reflect low financial literacy. Credit union members who borrow on payday loans have lower credit scores than other credit union members, and payday loan use declines rapidly when FICO scores exceed 600. Nonetheless, we find evidence for widespread and large pecuniary mistakes.

We compare payday loan amounts to liquidity available from a borrower's checking account, savings account, and line of credit. As a conservative method, we look at minimum liquidity in those accounts during the period when the payday loan would have been outstanding. We estimate that payday borrowers could have saved at least $88 during the 5.5 month observation period if they had fully utilized other sources of liquidity first. This paper has focused on a group of consumers, payday loan borrowers with credit union accounts, who could benefit from making better financial decisions. Further work should 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.

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	All Observations		Conditional on Having a Credit Score	
	Credit Union Representative Sample	Credit Union Payday Borrowers	Credit Union Representative Sample	Credit Union Payday Borrowers
FICO 1/11/2006	720	584	720	584
	(83.3)	(68.0)	(83.3)	(68.0)
FICO 3/26/2006	720	581	720	581
	(84.7)	(69.5)	(84.7)	(69.6)
Above Low CU Score Threshold (%)	96	76	96	77
Above High CU Score Threshold (%)	82	31	80	29
Total Liquidity on 1/1/2006 ($)	6528	832	7380	919
	(22467)	(2436)	(23698)	(2561)
Number of PDL's	0	3.29	0	3.36
		(2.69)		(2.74)
Payday Loan Amount ($)	0	424	0	434
		(248)		(249)
PDL Interest Paid ($)	0	166	0	170
		(97)		(97)
Number of Transactions	123	364	137	385
	(167)	(199)	(174)	(191)
Number of Checking Transactions	105	338	118	357
	(159)	(192)	(166)	(185)
Mean Absolute Checking Transaction ($)	294	145	305	147
	(627)	(86.7)	(632)	(87.2)
N	12240	3654	9656	3238

This table reports summary statistics for a representative sample of members of a credit union and for the subpopulation 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 'Credit Union Score Thresholds' affected access to credit from the credit union and affected the interest rate.

Source: Authors' calculations using administrative data from a credit union.

Table 2: Predictors of Pecuniary Losses from Payday Borrowing

	(1)	(2)	(3)	(4)
FICO 1/11/2006	-0.167 ***	-0.167 ***	-0.016 ***	-0.016 ***
	(0.038)	(0.038)	(0.001)	(0.001)
Checking Balance	3.896 ***	3.896 ***	0.002	0.002
	(1.092)	(1.092)	(0.002)	(0.002)
Savings Balance	0.975	0.975	0.003 ***	0.003 ***
	(2.539)	(2.539)	(0.001)	(0.001)
LOC Balance	7.813 ***	7.875 ***	0.239 ***	0.201 ***
	(2.548)	(1.023)	(0.033)	(0.030)
LOC Limit	0.062		-0.038 ***	
	(2.571)		(0.006)	
VISA Balance	-1.514	1.537	-0.024	-0.004
	(3.209)	(1.421)	(0.015)	(0.013)
VISA Limit	3.050		0.020 ***	
	(2.786)		(0.003)	
LOC Available		0.062		-0.038 ***
		(2.571)		(0.006)
VISA Available		3.050		0.020 ***
		(2.786)		(0.003)
Constant	176.15 ***	176.15 ***	12.38 ***	12.38 ***
	(22.199)	(22.199)	(0.539)	(0.539)
Adjusted R^2	0.029	0.029	0.008	0.008
N	3238	3238	12894	12894

Table 2 identifies predictors of pecuniary mistakes. In all regressions, the outcome variable is the size of the pecuniary loss measured at the individual level, and the Balances, Limits, and Credit Available are measured in thousands of dollars. Columns 1 and 2 include just 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% level.

Source: Authors' calculations using administrative data from a credit union.

Table 3: Payday Loan Usage as a Function of Credit Scores

	(1)	(2)	(3)	(4)	(5)	(6)
FICO	-0.836 ***			-0.051 ***		
	(0.015)			(0.002)		
FICO >= 700		0.042 **	0.05 **		0.001 ***	0.001 ***
		(0.021)	(0.021)		(0.000)	(0.000)
600 <= FICO < 700		1.085 ***	1.17 ***		0.042 ***	0.053 ***
		(0.028)	(0.028)		(0.002)	(0.003)
FICO < 600		2.1 ***	2.099 ***		0.146 ***	0.146 ***
		(0.032)	(0.031)		(0.006)	(0.006)
FICO	FICO >= 700			-0.148 **			-0.004 ***
			(0.059)			(0.001)
FICO	600 <= FICO < 700			-1.786 ***			-0.105 ***
			(0.099)			(0.008)
FICO	FICO < 600			-0.191 **			-0.035 **
			(0.075)			(0.015)
Constant	1.076 ***			0.061 ***		
	(0.016)			(0.002)		
N	12894	12894	12894	12894	12894	12894
Adjusted R^2	0.195	0.312	0.33	0.013	0.019	0.021

This table reports regression estimates of the number of payday loans taken out after 1/11/2006 and before 6/14/2006. The right-hand-side variables are functions of the credit score on 1/11/2006. The first three columns report unweighted regressions, while the last three are weighted to represent all the members of the credit union. The variables in the first, fifth, sixth, and seventh rows of the table all scale their continuous FICO scores by subtracting the mean of the score within the specified range and dividing by 100. ***, **, and * represent significance at the 1%, 5%, and 10% level, respectively.
Source: Authors' calculations using administrative data from a credit union.

Figure 1: Liquidity Over Time
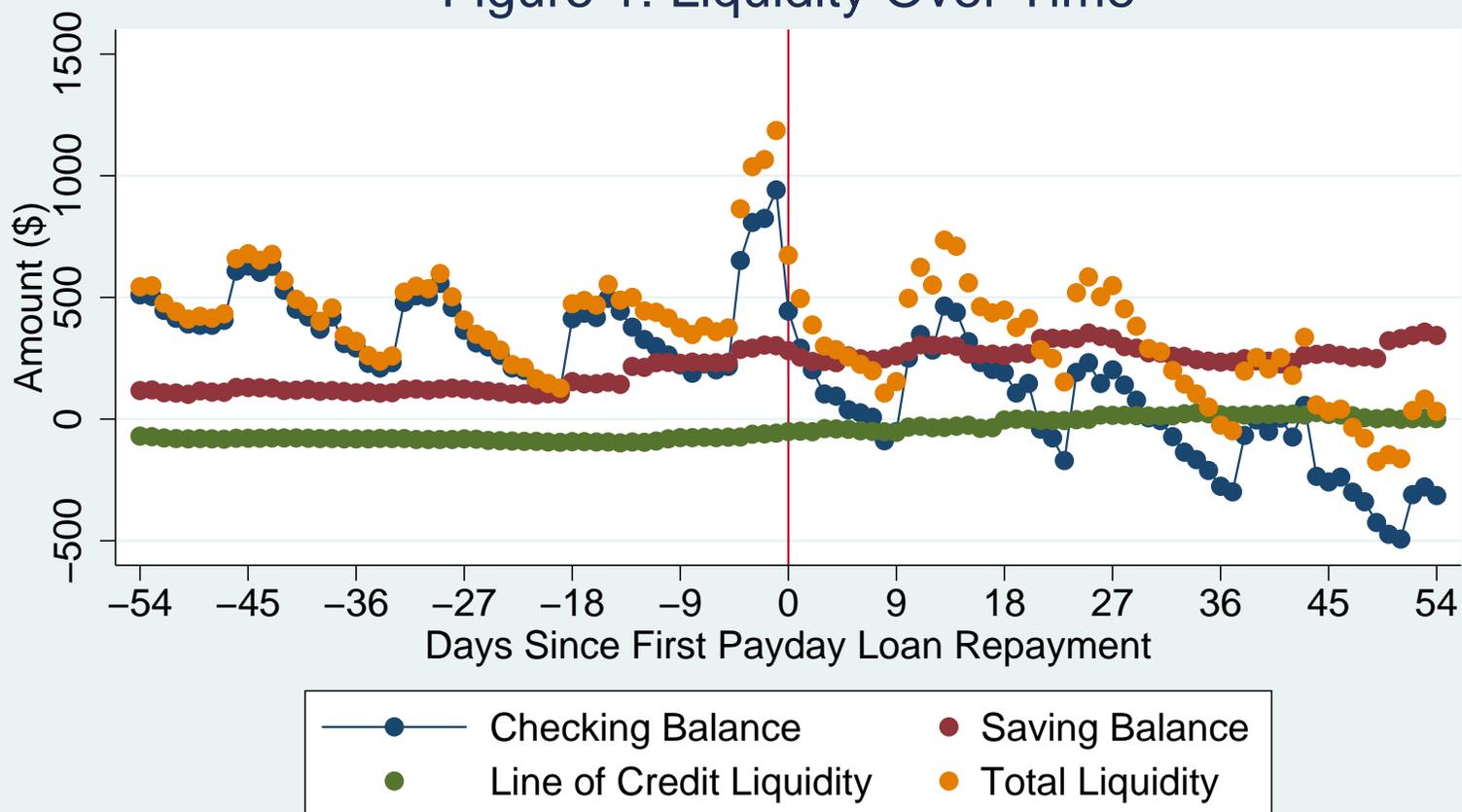
This figure reports the evolution of several forms of household liquidity around the time of credit union members' first observed payday loan repayments. We restrict the sample to individuals who are observed for 54 days before and 54 days after the repayment, i.e., to individuals whos first repayments occurred between 2/23/2006 and 4/18/2006.
Source: Authors' Calculations using administrative data from a credit union.

Figure 2: Distribution of Pecuniary Mistakes
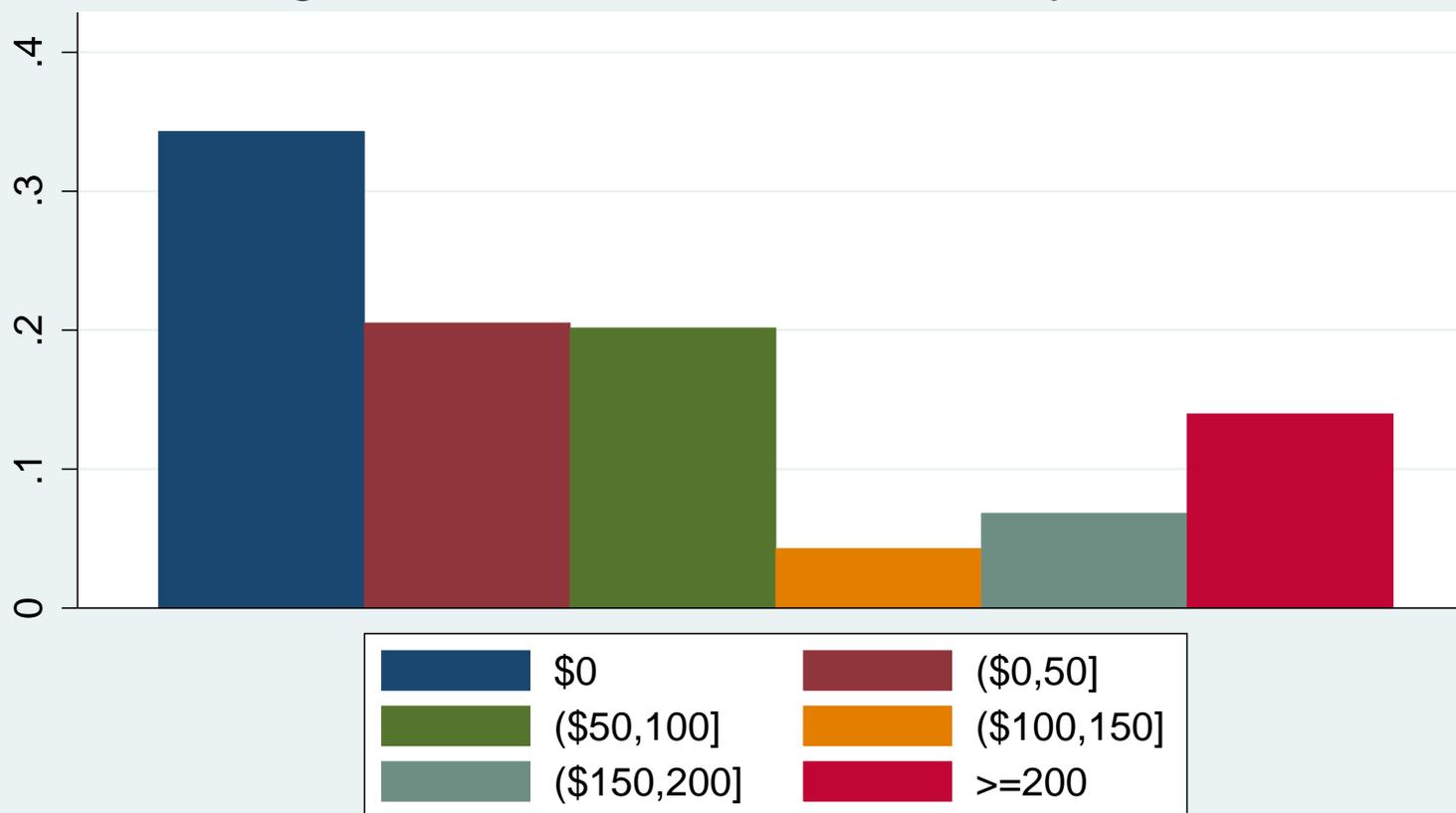
In the payday borrowing context, pecuniary mistakes occur when consumers take out payday loans but have lower−cost alternative sources of liquidity. This figure is a histogram of the dollar value of pecuniary losses among members of a credit union who took out payday loans between 1/1/2006 and 6/12/2006.
Source: Authors' calculations using administrative data from a credit union

Figure 3: Payday Borrowing vs. Credit Scores
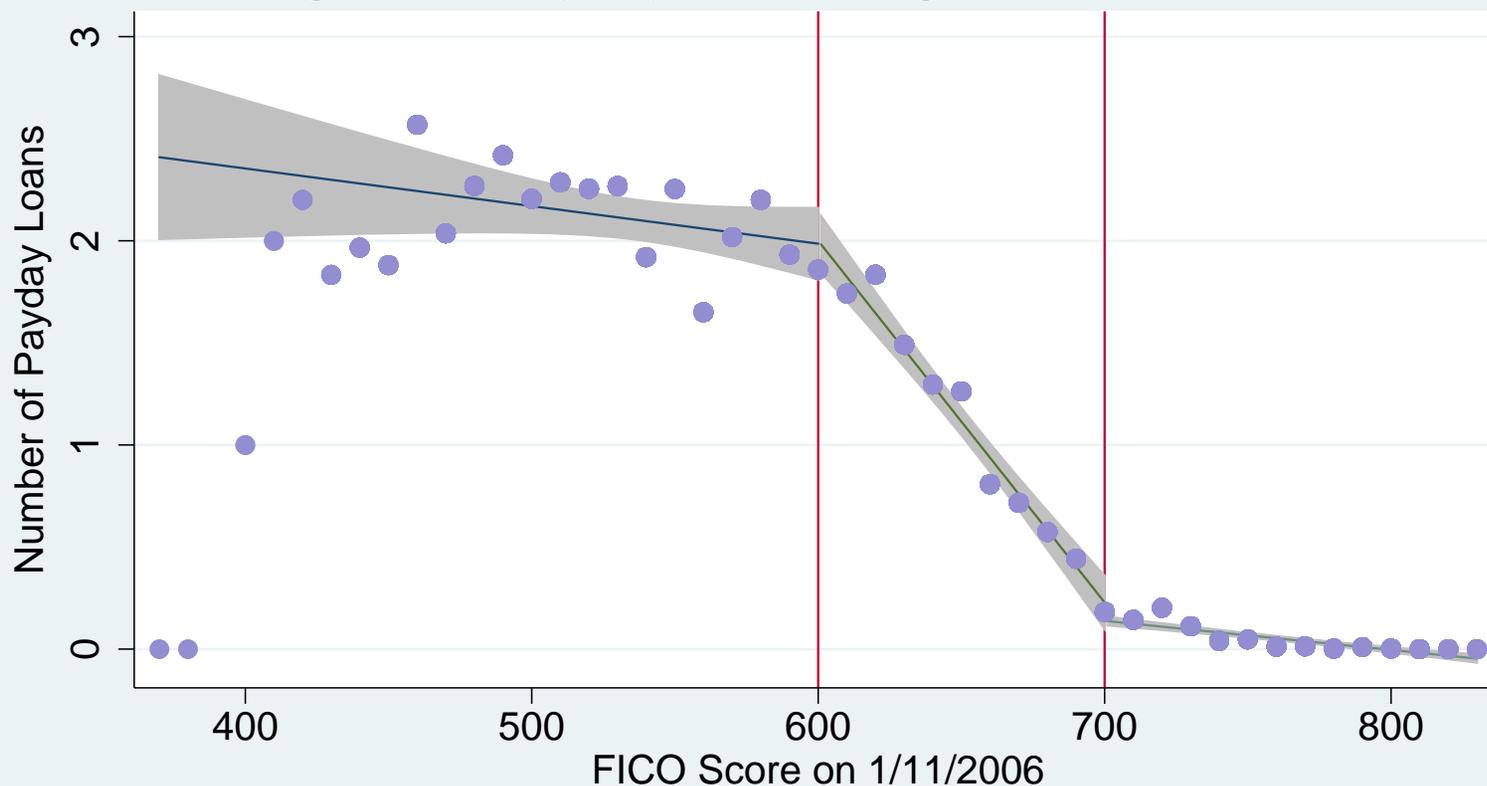
This figure displays the relationship between FICO scores on 1/11/2006 and subsequent payday borrowing. For clarity, the scatterplot rounds FICO scores to the nearest 10, and takes the mean of the number of observed payday loan repayments. The piecewise linear fit and associated 95% confidence intervals indicate how the level of payday borrowing and its relationship with FICO scores differs across the FICO score distribution.

Source: Authors' calculations using administrative data from a credit union.