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Access to Credit and Financial Health: Evaluating the Impact of Debt Collection

Julia Fonseca
Katherine Strair
Basit Zafar

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Abstract

Despite the prevalence of debt collection and the intense regulatory activity surrounding this industry, little is known about how these practices impact consumers. This paper conducts an empirical analysis of the effect of debt collection on consumer credit and on indicators of financial health, employing individual credit record data and a difference-in-differences research design that compares outcomes for consumers in states that increased the restrictiveness of legislation with those for consumers in the remaining states. We find consistent evidence that restricting collection activities leads to a decrease in access to credit and a deterioration in indicators of financial health. Moreover, our estimated treatment varies considerably with the borrower's age and baseline credit score, with effects concentrated primarily among borrowers with the lowest credit scores.

Key words: debt collection, financial well-being

Strair, Zafar: Federal Reserve Bank of New York. Fonseca (corresponding author): Princeton University (e-mail: juliaff@princeton.edu).

1 Introduction

Financial distress is pervasive in America. As of December 2015, $652 billion of outstanding household debt was in some stage of delinquency, and approximately two thirds of those balances were at least 90 days late. When faced with unmet payments, creditors turn to debt collectors to minimize their losses. This practice is prevalent, and close to 14% of American consumers have at least one account in third-party collection.[1] The likelihood of having an account in collection varies considerably across the credit score spectrum, with borrowers in the lower end of the credit score spectrum averaging 4 accounts in collection, and borrowers with credit scores above 700 averaging fewer than 1 account in collection.

In addition to being widespread, debt collection plays an important role in credit markets. Debt collection is a $13.7 billion industry with over 6,000 firms in operation in the United States and, according to ACA international—a trade association of third-party debt collectors—collection agencies recovered over $55 billion in 2013. By limiting the losses of creditors in case of default, debt collection allows for better enforcement of contracts. Theoretical work suggests that this in turn leads to increased supply of credit and lower interest rates, generating economy-wide impacts.[2]

On the other hand, delinquency can serve as an important tool for consumption smoothing when debtors are faced with negative shocks. The empirical literature on debt relief finds that this form of social insurance has important consequences for consumption, financial health, earnings, health insurance choice, and even mortality rates.[3] Moreover, a now extensive literature has uncovered evidence that financial distress imposes negative externalities on nearby individuals.[4] This paper sheds light on this trade-off between access to credit and the benefits of social insurance by estimating the causal effect of debt collection on consumer credit and on indicators of financial health.

We do so by exploiting time-series variation in the restrictiveness of state-level legislation regarding debt collection practices. These regulatory changes were first identified by Fedaseyeu (2015) and, between 2000 and 2012, there have been 29 changes in state regulations in 21 states, 22 of which were expected to increase the difficulty of collections. Our empirical

[1] Federal Reserve Bank of New York (2016).

[2] See, for instance, Mirrlees (1975), Holmstrom (1979), Grossman and Hart (1983).

[3] *E.g.* Dobbie and Song (2015), Mahoney (2015), Dobbie, Goldsmith-Pinkham, and Yang (2015).

[4] For instance, Guerrieri and Lorenzoni (2011), Philippon and Midrigan (2011), Eggertsson and Krugman (2012), Farhi and Werning (2013), Mian, Rao, and Sufi (2013), and Mian and Sufi (2014) find evidence that consumer debt overhang can depress regional consumption and employment.

strategy consists of comparing outcomes of consumers in states that increased the restrictiveness of legislation with those of consumers in the remaining states, and we estimate our coefficients of interest in a differences-in-differences framework.

To conduct this analysis, we use data from the Federal Reserve Bank of New York's Consumer Credit Panel (CCP), a panel consisting of a nationally representative 5% sample of all individuals with a credit record, constructed from credit report data provided by Equifax. We find a sizable and significant reduction in auto loan balances and a decline in credit card balances and non-traditional finance balances, a significant decrease in auto and credit card originations, a sizable and a significant increase in the likelihood of delinquencies, including a rise in delinquent credit card and non-traditional finance balances and a small but statistically significant reduction in credit scores.[5] Hence, our analysis suggests that restricting collection activities leads to a decrease in access to credit across the full spectrum of borrowers and to a deterioration in indicators of financial health. Moreover, we find that the deterioration in financial health outcomes is concentrated on individuals with the lowest credit scores (prior to the legislation changes).

In addition to contributing to the general understanding of the welfare consequences of debt relief, this paper has implications for the regulation of the debt collection industry. Despite the scarcity of causal evidence, the majority of states have issued legislation imposing varying restrictions on debt collection. Moreover, the Consumer Financial Protection Bureau (CFPB) has expressed its intent to issue new federal rules in the near future.[6]

Even amid this intense regulatory activity, the literature on debt collection remains surprisingly small. Dawsey, Hynes, and Ausubel (2013) document that consumers are less likely to file for bankruptcy in states with legislation that grants them private right of action against abusive in-house collection practices. Fedaseyeu and Hunt (2014) use the common agency framework to derive conditions under which third-party debt collection agencies will employ harsher practices in equilibrium than what creditors would use themselves. Fedaseyeu (2015) constructs a state-level index of debt collection regulation and uses changes in this index over time to estimate the impact of debt collection laws on the supply of credit. Our results are entirely consistent with these findings despite differences in our empirical strategy. We also significantly add to this analysis by considering a wide range of credit outcomes, by evaluating the impact of debt collection on consumer financial health, and by exploring

[5] Non-traditional finance is a category of debt commonly defined in the CCP to include retail cards, personal loans, and a residual loan category.

[6] Consumer Financial Protection Bureau (2013).

heterogeneity in our estimated treatment effect.

This paper also relates to the literature on policies that discourage default, which primarily focuses on personal bankruptcy. In their seminal paper, Gropp, Scholz, and White (1997) analyze how personal bankruptcy and bankruptcy exemptions affect the supply and demand for credit. Athreya (2006) develops an incomplete markets model where both secured and unsecured assets exist and are treated differentially in bankruptcy proceedings. The author finds that exemptions are negatively associated with the availability of unsecured credit. Livshits, MacGee, and Tertilt (2007) also propose an incomplete market framework of consumer bankruptcy to evaluate the welfare consequences of a "Fresh Start" system in which debtors can discharge existing debt via bankruptcy. Athreya, Tam, and Young (2009) develop a partial equilibrium model focused on understanding the merits of harsh default penalties versus keeping penalties low but providing loan guarantees to lenders so as to lower the price of credit to households. In an empirical analysis, Severino, Brown, and Coates (2015) use changes in the level of protection across US states and across time and find that bankruptcy protection laws increase borrowers' holdings of unsecured credit. Our paper contributes to this literature by empirically analyzing the consequences of policies relating to debt collection, which is in itself a form of discouraging default.

The remainder of this paper is structured as follows. Section 2 provides a brief overview of the debt collection industry and the regulatory environment. Section 3 describes our data and provides summary statistics. Section 4 outlines the conceptual framework that guides our empirical work. Section 5 describes our empirical strategy. Section 6 presents the results of our analysis. Section 7 concludes.

2 Debt Collection

2.1 Background

When debtors fail to make one or more payments, creditors have the option of using debt collection in an attempt to recover all or part of what is owed to them. Debt collection is a sizable industry with over 6,000 firms in operation in the United States and is evaluated by ACA international at 13.7 billion dollars. Also according to ACA international, collection agencies recovered over $55 billion in 2013 and its main customers are health care providers, financial institutions, and the government.

Creditors can make use of this resource in three different ways: they can attempt to collect

debts themselves, hire a third-party debt collector to collect on their behalf, or sell the debt to a debt buyer.[7] Collecting debt in house or retaining a third-party collector allows for more control over the interaction with customers but entails administrative and monitoring costs, and the amount that will be recovered is uncertain. Selling debt to a debt buyer provides an immediate and certain monetary gain, but requires foregoing control over how consumers will be approached in the collection process. Debt collectors or debt buyers collecting on debt can use a variety of tools. Under certain conditions, they are allowed to contact debtors to negotiate a repayment plan for the delinquent debt. Moreover, they can resort to legal action to either seize the debtor's property or garnish the debtor's wages.

Apart from its potential benefits for creditors, collection practices can also be reasonably expected to impact consumers. The CFPB estimates that 70 million consumers have been contacted about a debt in collection at least once.[8] The agency also handles more complaints about debt collection than about any other financial product or service.

2.2 Regulation

At the federal level, debt collection practices are governed by the Fair Debt Collection Practices Act (FDCPA), which was instituted in 1977.[9] The FDCPA prohibits harassment, misrepresentation, and what it defines as "unfair practices" in the attempt to collect debt.[10] The FDCPA regulates the action of third-party debt collectors and of debt buyers who engage in debt collection, but not the practices of original creditors collecting their own debt. Furthermore, the FDCPA explicitly allows states to impose further regulation on debt collection practices, as long as the protection afforded to consumers is greater than what is provided by federal law.

At the state level, most legislation falls under one of two categories: (1) surety bond and licensing requirements, or (2) penalties and private remedies. Thirty two states currently require that collection agencies be licensed in order to collect from consumers residing in that state. This can range from the requirement that they obtain a general business license to the requirement that they be licensed by a specific regulatory agency, and usually requires

[7] Federal Trade Comission (2013).

[8] www.consumerfinance.gov/about-us/blog/your-voice-your-story-consumer-views-debt-collection

[9] 15 U.S.C. §§ 1692-1692p.

[10] Examples of unfair practices are the collection of any amount not expressly authorized by the contract that originated the debt or threatening legal action when it is not permitted by law or when there is no present intention of such action.

the payment of a fee. In addition to licensing requirements, twenty nine states require that collection agencies purchase a surety bond contract. A surety bond contract specifies that a surety or guarantor will pay one party (the obligee) a certain predetermined amount in the event that a second party (the principal) fails to meet some obligation. In the context of debt collection, the obligee is a state-level regulatory agency and the principal is the collection agency. In most cases, both licenses and surety bonds have to be renewed annually.

Most states also impose a civil or administrative penalty to be levied for each violation of a debt collection legislation. The size of penalties varies considerably across states, ranging from $1,000 to $10,000 per violation.[11] Some states have also enacted acts that specify private remedies, such as damage provisions and class action lawsuits.[12] While surety bond and licensing requirements add to a collection agency's yearly operational cost, penalties and private remedies affect the cost that an agency faces if it is found in violation of a debt collection legislation. Moreover, the jurisdiction for state legislation is the state in which the consumer resides.

3 Data

We use data from the Federal Reserve Bank of New York's Consumer Credit Panel (CCP), a nationally representative 5% sample of all individuals with a credit record and a valid Social Security number. This ongoing panel tracks the same individuals over time at a quarterly frequency since 1999, and contains credit report data provided by Equifax. The CCP sample design automatically refreshes the panel so as to generate the same entry and exit behavior as in the population, and is hence representative at any given quarter.[13]

Given the annual nature of our other variables, we restrict our sample to fourth-quarter data from the CCP. Moreover, we employ a random 1% sample rather than the full random 5% sample of the eligible U.S. population due to the extremely large number of observations. Our sample therefore consists of an annual unbalanced panel from 1999 to 2014 with 25,365,534 individual-year observations and data from 3,003,757 distinct individuals.[14] Our main outcome variables consist of auto balances and limits, credit card balances and limits,

[11] See, for instance, § 559.5556, Fla. Stat. Since 2010, Florida's Office of Financial Regulation can impose an administrative fine of up to $10,000 for each violation of debt collection legislation.

[12] One example of such an act is Ark. Code Ann. § 17-24-501 *et. seq.*

[13] For more details on the CCP, see Lee and van der Klaauw (2010).

[14] We have verified that our results are robust to 1% and 2% trimming.

non-traditional finance balance and limits, total originations, new credit cards issued, delinquent balances, delinquency status (current, 30 days late, 60 days late, 90 days late, 120 or more days late, and severely derogatory), and credit scores.[15]

We supplement this dataset with data from the Census County Business Patterns (CBP). This annual survey provides the number of establishments, number of employees and annual payroll by industry, and tracks third-party debt collection agencies under code 561140 of the North American Industry Classification System (NAICS). We use this dataset to argue that the changes in state-level regulation concerning debt collection practices had a significant impact in this industry, and that this impact is consistent with what we would *a priori* expect given the nature of these legislation changes. To provide further evidence of this impact, we utilize data on the yearly dollar amount collected by Florida's Office of Financial Regulation as a result of penalties levied on debt collectors.

Finally, we utilize data on a number of macroeconomic variables in order to evaluate the possibility that another omitted factor relevant for our outcome variables changes contemporaneously with our treatment, namely state-level changes in debt collection legislation. We obtain state-level income data from the IRS Income Tax Statistics from 2000 to 2013. We use house prices at the state level from the CoreLogic housing price index (HPI), which uses repeated sales transactions to track changes in sale prices for homes over time and is the most comprehensive house price index available. Data on unemployment rates at the state level from 2000 to 2013 comes from the Bureau of Labor Statistics.

Table 1 displays summary statistics for all variables in our sample.

4 Conceptual Framework

In this section, we discuss the different channels through which access to credit and indicators of financial health are potentially affected by legislation restricting debt collection practices. We also review the predictions which will guide our empirical exercise.

[15] The credit score available in the CCP is the Equifax Risk Score.

4.1 Access to credit

Debt collection is an important tool at the disposal of creditors to recover on delinquent debt. Hence, restricting debt collection practices should lead to a decrease in the overall supply of credit since creditors will be less willing to lend. Moreover, a decrease in recovery can also lead to an increase in the demand for credit both through a moral hazard channel and through an adverse selection channel. The first one predicts that individuals will take on more risk and/or over borrow, while the second one predicts that borrowers who know they are more likely to default will demand more credit.

Another mechanism that can potentially impact credit conditions is that delinquency introduces contingency in credit contracts. In other words, by ceasing payments on their debt, consumers are able to smooth negative shocks. Thus, if debt collection practices are restricted, agents who are risk averse will be willing to take on more debt and demand for credit will increase. In summary, restricting debt collection should lead to a decrease in the supply of credit and an increase in the demand for credit. The net effect on the quantity of credit is hence theoretically ambiguous and will depend on the magnitudes of the supply and demand responses.

4.2 Financial health

Since delinquency introduces contingency in credit contracts, a restriction of debt collection practices provides a form of insurance for consumers by allowing them to smooth negative shocks, which should improve financial health. On the other hand, restricting debt collection practices essentially lowers the cost of default. This in turn can lead to an increase in delinquencies through a moral hazard or an adverse selection channel.

4.3 Empirical predictions

In terms of access to credit, empirical predictions depend on whether the demand effect or the supply effect dominates. If the decrease in the supply of consumer credit is the dominating effect, we would expect to see a decrease in the total quantity of credit. On the other hand, if the increase in the demand for credit dominates, we should instead see an increase in the equilibrium quantity of credit. These impacts could be manifest across the credit spectrum, or they could be targeted differently depending on the quality of borrower.

Regarding financial health, the direction of the final effect depends on which of two effects dominates: the benefit of social insurance arising from less intense debt collection, or the moral hazard/adverse selection effect in response to a lower cost of default. If the first effect dominates, we would expect to see an improvement of indicators of financial health as consumers are able to smooth consumption in the face of negative shocks. Alternatively, if the dominating channel is moral hazard/adverse selection, we would instead see higher delinquencies and hence a worsening in indicators of financial health.

5 Empirical Strategy

Our identification strategy exploits time-series variation in the strictness of state legislation concerning debt collection practices. These regulatory changes were first identified by Fedaseyeu (2015) and, between 2000 and 2012, there have been 29 changes in state regulations in 21 states. To make our results more easily interpretable, we focus on instances in which state laws regarding debt collection were made more restrictive, which leaves us with 22 legislation changes in 17 states.[16] Intuitively, our difference-in-differences strategy consists of comparing outcomes of consumers in states that increased the restrictiveness of legislation with those of consumers in the remaining states.[17]

One underlying assumption of this analysis is that these changes in state-level legislation regarding debt collection practices meaningfully impact the industry. We provide evidence for this assumption by estimating the following equation using Census County Business Patterns data:

$$y_{st} = \alpha + \beta Law_{st} + \kappa_s + \theta_t + \epsilon_{st} \tag{1}$$

where y_{st} is either the number of debt collection employees normalized by population (number of debt collectors per one million people) or the number of collection agencies; s is a state, t is the observation year; Law_{st} is a variable that is 0 before the debt collection legislation change in state s and 1 after; θ_t is a vector of year fixed effects; and κ_s is a vector of state fixed

[16] Four states—Connecticut, Minnesota, North Carolina, and Nevada—enacted two law changes during this period. In the results we show, we consider the timing of the law change to be the year the first change was enacted. We have verified that our results are robust to alternative definitions.

[17] In the estimates we report in this paper, the control group includes states that passed legislation that decreased the difficulty of collections. We have checked that our results are robust to redefining the control group to exclude the set of states that made collection laws less restrictive.

effects. Our coefficient of interest, which is β, represents the average within-state change in our outcome variables (number of collection employees or collection agencies) following the legislation change. We also analyze the dynamics around the time of legislation changes by replacing the Law_{st} with dummy variables for each year from 4 years before to 4 years after each law change.

Additionally, a primary concern in difference-in-differences analyses is the possibility that another omitted factor relevant for the outcome variable of interest changes contemporaneously with the treatment—in our case, with the introduction of state-level legislation regarding debt collection practices. In an attempt to alleviate this concern, we examine the dynamics of various macroeconomic factors in the years preceding the reforms. Specifically, we regress an indicator Law Change^{-n} that takes the value of 1 if a state will tighten legislation regarding debt collection practices in n years on income, unemployment rate, house prices, number of debt collectors, number of collection establishments, number of payday lenders, and number of payday lending establishments. If the legislation changes are systematically passed in response to economic conditions, the coefficients will be statistically different from zero. We conduct this analysis using $n = 0$, $n = 1$, and $n = 5$ to capture both contemporaneous and long-run effects, and report results in the appendix in Table A.1. Results indicate that none of these variables exhibit any systematic patterns in the run-up to legislation changes.

Formally, our primary analysis makes use of the fact that different states changed debt collection laws in different years and estimate our coefficients of interest in a differences-in-differences framework. Our baseline specification is the following:

$$y_{ist} = \alpha + \beta Law_{st} + \kappa_i + \theta_t + \pi_s Year_t + \epsilon_{ist} \tag{2}$$

where y_{ist} is a given outcome for individual i, in state s, and in year t; Law_{st} is a variable that is 0 before the debt collection legislation change in state s and 1 after; θ_t is a vector of year fixed effects; κ_i is a vector of individual fixed effects; and π_s allows for a linear state-specific time trend. Following Bertrand, Duflo, and Mullainathan (2004), residuals are clustered at the state level. As discussed in previous sections, the outcomes we will consider include proxies for access to credit and for financial health, such as credit balances and limits, originations, credit cards issued, delinquent balances, delinquency status, and credit scores. We run this specification both in the full sample, and in subsamples that group individuals by their credit score in 1999 in order to investigate whether there is significant heterogeneity in our estimated treatment effect.

Our coefficient of interest is β, and it measures the average reduced form effect of restricting debt collection activity on our outcomes of interest. As with any differences-in-differences research design, the identifying assumption is that of parallel trends: in the absence of a change in legislation and conditional on controls, outcome variables of individuals residing in states that introduced a change in legislation regarding debt collection practices would have evolved similarly to outcome variables of individuals in states that did not change legislation. We evaluate the validity of this assumption by analyzing the dynamics of our main outcome variables around the time of the law changes. We do so by estimating an equation analogous to (2) but where the Law_{st} dummy is replaced by dummy variables for each year from 4 years before to 4 years after each law change.

6 Results

6.1 Impact on the debt collection industry

Before moving on to our main results of interest, we present evidence in support of the underlying assumption of our analysis: that changes in state-level legislation regarding debt collection practices meaningfully impact the debt collection industry. We do so by estimating equation (1) using data on third-party debt collectors (NAICS code 561140) from the Census Business Patterns survey.

Results of this exercise can be found in Table 2. We can see from columns 1-2 that increasing the restrictiveness of debt collection legislation has a sizable and significant impact on the number of debt collection employees in the state, both when we run our specification in levels and in logs. We find a decrease in the number of collectors of over 30 percentage points, and this estimate is significant at the one percent level. In addition, Figure 1 shows the timing of this effect by plotting estimates and 95% confidence intervals obtained by replacing the law dummy in equation (1) with dummy variables for each year from 4 years before to 4 years after each law change. We can see that the timing is consistent with the estimated effect being driven by legislation changes and there is no evidence of a preexisting trend in states that enacted law changes. We take this as evidence that collection agencies are significantly impacted by the enactment of state-level legislation regarding debt collection practices.

Columns 3-4 of Table 2 seem to suggest that law changes have no impact on the number of collection establishments, but this result actually masks a significant amount of heterogeneity. Moreover, this heterogeneity is entirely consistent with what we would expect given

the nature of legislation changes. As described in section 2, most state-level legislation falls under one of two categories: (1) surety bond and licensing requirements, or (2) penalties and private remedies. While surety bond and licensing requirements add to a collection agency's yearly operational cost, penalties and private remedies affect the cost that an agency faces if it is found in violation of a debt collection legislation, so it is reasonable to expect that these two categories of law changes affect the debt collection industry differentially.

In most cases, legislation changes altered bonding requirements from a flat requirement to a function of collection revenue. One example of such a structure is found in the state of Minnesota, which in 2011 changed bonding requirements from $20,000 regardless of establishment size to a surety bond contract of $50,000 plus $5,000 for each $100,000 in yearly collection revenue. Since the cost of a surety bond went from fixed to an increasing function of the amount that the obligee is liable for, this should affect a collection agency's decision between setting up as multiple small establishments or one larger establishment. In particular, we would expect to see an increase in the number of small collection establishments. On the other hand, penalties and private remedies speak to the cost that a collection agency is faced with if it violates debt collection legislation. We may expect that larger establishments are better equipped to handle such a scenario and that this category of legislation changes may have a "wipe out effect" on smaller establishments.

To test whether these predictions hold in the data, we regress the number of collection establishments and the average number of employees per establishment at the state-year level on each of these two categories of law changes, and report results of this exercise in Table 3. This specification is analogous to equation (1), but we replace the law dummy with a dummy for each category. In columns 1-4, we can see that estimates are consistent with predictions. We see that category 1 law changes (licensing and bonding requirements) lead to an increase in the number of establishments, which is significant in logs at the ten percent level. Alternatively, category 2 law changes (penalties and private remedies) lead to a small decrease in the number of establishments.

The average number of collectors per establishment tells a similar story. We see a sizable decrease of over 30 percentage points in the number of collectors per establishments following a category 1 law change, and estimates are significant at the one percent level both in the log and the level specification. We also see an increase in the average number of collectors per establishment following a category 2 law change, although estimates are not statistically significant.

Additionally, Table 4 reports the results of regressing the number of collection establishments

at the state-year level which have either fewer or more than 50 employees on each of the two categories of law changes. The results of this exercise are again consistent with the prediction that category 1 law changes (licensing and bonding requirements) lead to an increase in the number of small establishments and a decrease in the number of large establishments, while category 2 law changes (penalties and private remedies) lead to a small decrease in the number of establishments. We see a significant increase in the number of establishments with fewer than 50 employees and a decrease in the number of establishments with more than 50 employees following a category 1 law change. As a result of a category 2 law change, we see a significant decrease in the number of establishments with fewer than 50 employees, consistent with a "wipe out effect".

We have so far presented evidence that collection agencies are impacted by changes in state-level legislation regarding debt collection practices at a micro level, using data on the number of collection employees and establishments. We add to this evidence by using data we obtained from the Office of Financial Regulation in Florida on total administrative penalties to show that legislation changes seem to have the intended effect on an aggregate level. In Figure 2, we plot the time-series evolution of the dollar amount of administrative penalties collected in the state of Florida. We see that prior to the 2010 legislation change which increased administrative penalties from $1,000 for repeated violations to up to $10,000 per violation, no penalties had been levied on collection agencies. We attribute this to the general absence of repeated violations among debt collection agencies in Florida.

6.2 Impact on access to credit

Next, we present our primary results regarding the effect of a tightening in debt collection legislation on access to credit. We report results for the entire sample of borrowers, as well as for borrowers grouped by credit score bracket—below 500, 500 to 600, 600 to 700, and above 700—as we find variation in our estimates by borrower credit score.[18]

Table 5 presents differences-in-differences estimates of equation (2) with auto loans and auto limits as dependent variables. The estimated treatment effect for the full sample is a reduction in auto loans of $212.79 and a reduction in auto limits $308.93, and both estimates are significant at the one percent level. Moreover, these point estimates are sizable when compared to a sample mean of $3,784.88. The decrease in auto balances and limits holds

[18]We group borrowers based on their credit score in 1999, before any of the legislation changes we use in our analysis take place.

across all credit score categories, although point estimates are larger towards the lower range of the credit score distribution.

We can note from Table A.2 in the appendix that none of our estimates for credit card balances and limits are statistically significant. However, we report in Table 6 results with credit card origination as the dependent variable and find a significant decrease in the full sample of $89.73, which seems to almost entirely be driven by a decrease in credit card originations to individuals with the lowest credit scores. Hence, while we do see a decrease in the balance of newly issued credit cards, overall balances and limits are largely unaffected. We can also see from Table 6 that auto originations are also significantly reduced following a tightening in state-level collection legislation. Moreover, this effect is concentrated on individuals with low credit scores.

Table 7 reports estimates for non-traditional finance balances and limits. Non-traditional finance is a category of debt commonly defined in the CCP to include retail cards, personal loans, and a residual loan category. While estimates of changes in non-traditional finance balances are statistically insignificant, we find sizable and significant decreases in limits.

As a test of our proposed mechanism, we also estimate equation (2) with mortgage balances and limits as the dependent variable. Since debt collectors are rarely retained to collect on mortgage debt, we would not expect changes to collection legislation to affect this credit category. We report the results of this exercise in the appendix in Table A.3 and are reassured to find no statistically significant effects.

We expand on our analysis by investigating whether our results vary considerably across the age spectrum. We do so by splitting our sample into two groups according to their age in 1999 (the median age for the sample in 1999 was 43) and running regressions separately for the two groups. In Table 8, we report results for auto and credit card originations. While the pattern for credit card originations is not entirely clear, we do see that auto originations decrease mainly for younger individuals with low credit scores. We report results for auto balances and limits and non-traditional finance balance and limits in tables A.4 and A.5 in the appendix. As with auto originations, we find that the decrease in auto balances and limits is stronger for younger individuals, especially those with low credit scores.

In addition to our regression results, we evaluate the validity of the parallel trends assumption by analyzing the dynamics of our main outcome variables around the time of the law changes. Figure 3 shows the results of this exercise for auto and non-traditional finance limits by plotting estimates and 95% confidence intervals obtained by replacing the law dummy in equation (2) with dummy variables for each year from 4 years before to 4 years after each

law change. We find no evidence of a preexisting trend in states that enacted law changes.

We also verify whether legislation changes impacted the extensive margin of access to credit, *i.e.*, the share of individuals with a credit report in a given state relative to the total population. In a state-level regression with year and state fixed effects, we estimate a change in the share of individuals with a credit report following an increase in the restrictiveness of debt collection legislation of -0.41 percentage points (with a standard error of 0.58). Not only is the change small in magnitude, our estimate is not statistically significant. This result suggests there was no significant change in the selection of individuals into credit markets.

6.3 Impact on financial health

Finally, we discuss the results of our analysis of indicators of financial health. In the first panel of Table 9, we can see estimates for credit card delinquencies. While the estimate for the full sample is not statistically significant, estimates for the lowest credit score group (below 500) are positive and significant at $104.67. This estimate represents a sizable increase in delinquent credit card balances when compared to a mean of $692.75. In the next panel of Table 9 we report analogous results for non-traditional finance delinquencies. We again find an increase in delinquent balances of individuals in the below-500 credit score range of $80.04. Note that the inclusion of individual fixed effects in our baseline specification essentially shuts down the adverse selection channel by estimating our coefficients of interest using only within-individual variation. Hence, our results point to an increase in delinquent balances due to moral hazard. The last panel of Table 9 reports estimates of equation (2) with credit scores as the dependent variable. We find a small but statistically significant decrease in credit scores for individuals in the two lower credit score groups of approximately 2 points.

We also investigate whether the increase in delinquencies is due to an increase in the number of people with delinquent balances (the extensive margin) or to an increase in the duration of delinquency (the intensive margin), and report results in the appendix. In summary, we find evidence that both mechanisms are relevant. In Table A.6 we report differences-in-differences estimates of equation (1) with early stage delinquent balances, *i.e.* balances that have been delinquent for no more than 60 days, as the dependent variable. We can see that results are generally not statistically significant and, if anything, there was a small decrease in early stage delinquent auto balances. Table A.7 reports analogous results for late stage delinquent balances, *i.e.* balances that have been delinquent for 90 days or more. We find that an increase in late stage delinquent credit card and non-traditional balances accounts

for all of the increase in delinquent balances. This suggests that the duration of delinquency increased as a result of legislation changes.

Finally, we report in Table A.8 differences-in-differences estimates of equation (2) with a dummy that equals 1 if the individual has any delinquent balances as the dependent variable. For expositional purposes, we scale our estimates by multiplying them by 100, so that coefficients can be interpreted as percentage points. We also report results of analogous regressions for the likelihood of early and late stage delinquency. We can see from Table A.8 that increasing the restrictiveness of debt collection legislation leads to an increase in the likelihood that an individual has any delinquent balances by 1.8 to 2.3 percentage points for individuals in the lowest credit score categories. We also find that the entire effect is driven by an increase in the likelihood of late stage delinquencies. Hence, it seems that there is simultaneously an increase in the number of individuals with low credit scores that have delinquent debt and in the average severity of their delinquent status.

7 Concluding Remarks

In this paper, we exploit time-series variation in the restrictiveness of debt collection legislation at the state level to estimate the impact of debt collection practices on access to consumer credit and on individual financial health in a differences-in-differences framework. Our analysis suggests that restricting collection activities leads to a decrease in access to credit and to a deterioration in indicators of financial health. Specifically, we find a sizable and significant reduction in auto loan balances, a significant decline in credit card and non-traditional finance balances, a significant decrease in auto and credit card originations, a sizable and significant increase in delinquent credit card balances and non-traditional finance balances, and a small but statistically significant reduction in credit scores.

Our findings regarding access to credit suggest that the decrease in supply resulting from stricter collection laws dominates the increase in demand, and our financial health effects are consistent with moral hazard since they are estimated using within-individual variation. We find that the decrease in access to credit is stronger for borrowers with low credit scores, but is felt across the credit spectrum. On the other hand, our results regarding financial health are entirely concentrated on individuals with low credit scores. These results have important implications at the borrower level and suggest a wide-spread deleterious effect of changes in debt collection legislation on individuals who retain access to credit.

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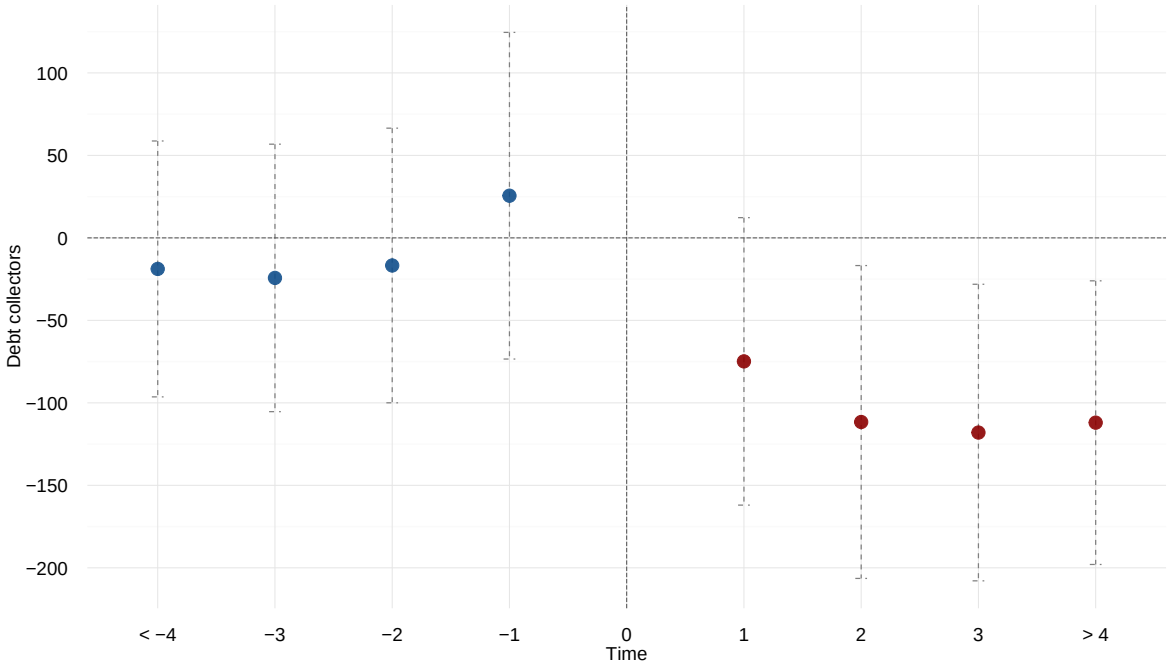


Figure 1: Dynamics of impact on number of debt collectors

This figure shows the timing of the effect of state-level legislation changes on the number of debt collection employees. The specification is the same as equation (2) except that the law dummy is replaced by dummy variables $I(k)$ equal to one exactly k years after (or before if k is negative) the law change. The point estimates of the dummy variables $I(k)$ and the 95% confidence intervals are plotted. Observation is at the state-year level and robust standard errors are used.

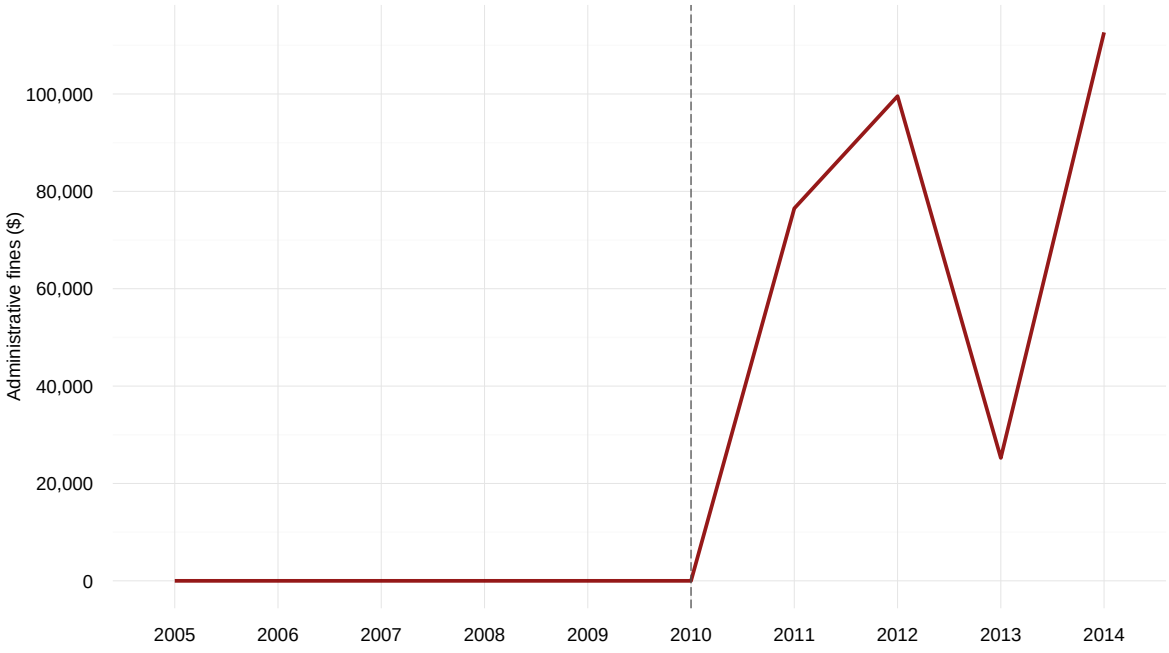
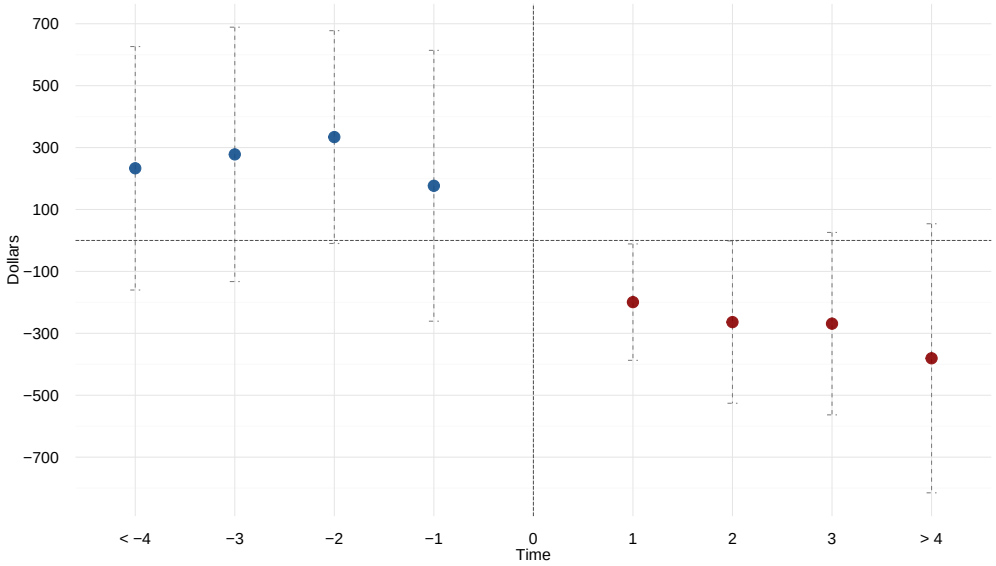
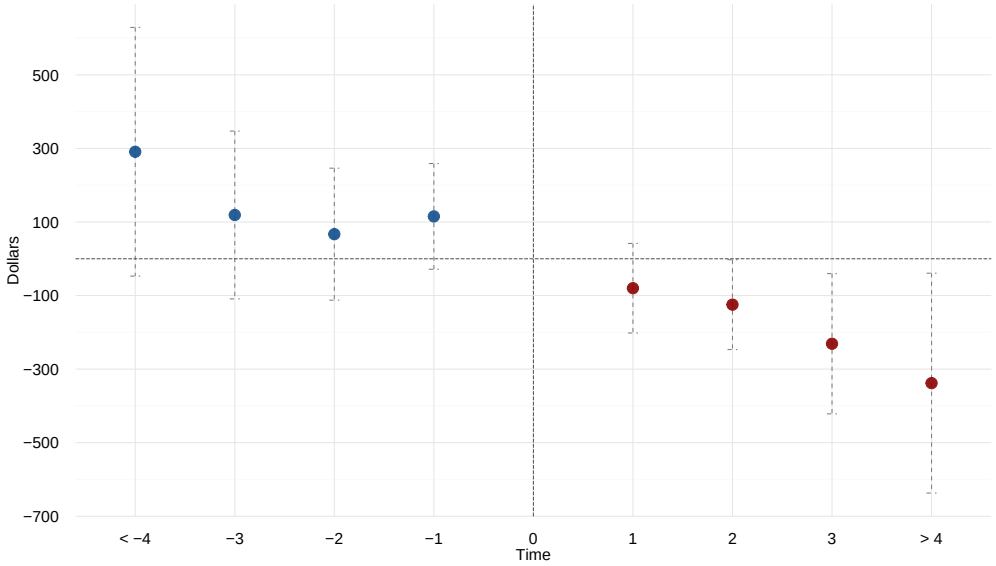


Figure 2: Impact of legislation change on administrative penalties in Florida

This figure shows the time series of the dollar amount of administrative penalties collected in the state of Florida by the Office of Financial Regulation.



(a) Auto limit



(b) Non-traditional finance limit

Figure 3: Dynamics of impact on credit limits

This figure shows the timing of the effect of state-level legislation on auto limits and on non-traditional finance limits. Non-traditional finance is a category of debt commonly defined in the CCP to include retail cards, personal loans, and a residual loan category. The specification is the same as equation (2) except that the law dummy is replaced by dummy variables $I(k)$ equal to one exactly k years after (or before if k is negative) the law change. The point estimates of the dummy variables $I(k)$ and the 95% confidence intervals are plotted. Observation is at the individual-year level and standard errors are clustered at the state level.

Variable	N	Mean	Median	Min	Max
CCP outcome variables					
Auto Balance	19,441,290	$3,784.88	$0	$0	$3,291,206
Auto Limit	19,441,290	$5,841.96	$0	$0	$9,999,999
Credit Card Balance	19,441,290	$4,090.36	$0	$0	$6,197,461
Credit Card Limit	19,441,290	$16,350.64	$7,700.00	$0	$9,999,999
NT Finance Balance	19,441,290	$2,224.48	$0	$0	$9,999,999
NT Finance Limit	19,441,290	$5,595.74	$1,500.00	$0	$9,999,999
New Auto Origination Balance	2,126,781	$12,338.28	$9,971.00	$0	$3,291,206
New Credit Card Origination Balance	14,978,435	$2,029.70	$0	$0	$9,998,130
Auto Origination Balance - Young	1,320,852	$12,727.40	$10,264.00	$0	$3,291,206
Auto Origination Balance - Old	805,929	$11,861.01	$9,502.75	$0	$2,757,000
Credit Card Origination Balance - Young	7,581,481	$2,042.77	$0	$0	$9,998,130
Credit Card Origination Balance - Old	7,396,954	$2,252.18	$0	$0	$9,998,103
Delinquent Credit Card Balance	19,441,290	$381.58	$0	-$899,650	$999,999
Delinquent NT Finance Balance	19,441,290	$152.49	$0	-$1,397,555	$999,999
Credit Score	19,441,290	702.41	733	284	848
Mortgage Balance	19,441,290	$18,231.50	$0	$0	$11,300,000
Mortgage Limit	19,441,290	$152.49	$0	$0	$11,300,000
Auto Balance - Young	9,828,793	$4,801.20	$0	$0	$3,291,206
Auto Balance - Old	9,612,497	$2,728.28	$0	$0	$2,770,000
Auto Limit - Young	9,828,793	$7,263.56	$0	$0	$9,999,999
Auto Limit - Old	9,612,497	$4,365.72	$0	$0	$9,999,999
NT Finance Balance - Young	9,828,793	$2,423.58	$0	$0	$9,995,873
NT Finance Balance - Old	9,612,497	$2,013.27	$0	$0	$9,999,999
NT Finance Limit - Young	9,828,793	$5,423.50	$1,260.00	$0	$9,999,999
NT Finance Limit - Old	9,612,497	$5,772.25	$1,800.00	$0	$7,000,450
Early Stage Delinquent Auto Balance	19,441,290	$135.34	$0	$0	$1,238,000
Early Stage Delinquent Credit Card Balance	19,441,290	$146.46	$0	$0	$1,580,425
Early Stage Delinquent NT Finance Balance	19,441,290	$130.20	$0	$0	$3,049,254
Late Stage Delinquent Auto Balance	19,441,290	$132.56	$0	$0	$880,000
Late Stage Delinquent Credit Card Balance	19,441,290	$376.23	$0	$0	$1,629,294
Late Stage Delinquent NT Finance Balance	19,441,290	$168.56	$0	$0	$9,999,999
Any Delinquency	19,441,290	0.13	0	0	1
Early Delinquency	19,441,290	0.05	0	0	1
Late Delinquency	19,441,290	0.12	0	0	1
County Business Patterns outcome variables					
Number of Debt Collectors	765	1944.3	850	0	13524
Number of Collection Establishments	765	97.6	63	1	541
Establishments with <50 Employees	765	87.0	57	1	480
Establishments with ≥50 Employees	765	10.7	6	0	64

Table 1: Summary statistics for the estimation sample

1% panel of Equifax CCP, Q4 of years 1999 to 2014, for individuals in the sample in 1999. State-level Census CBP data for NAICS code 561140 (third-party debt collectors).

	Debt Collectors		Collection Establishments	
	Level	Log	Level	Log
Law	-74.64^{***}	-0.34^{***}	-2.55	-0.00
	(19.52)	(0.08)	(1.74)	(0.02)
Mean	295.27		105.31	
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	611	611	611	611
R^2	0.80	0.82	0.99	0.99

Table 2: Impact on number of debt collectors and collection agencies

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on the number of debt collection employees (per one million inhabitants) and debt collection establishments at the state-year level. All regressions include the law change dummy, and state and year fixed effects. Columns 1-2 report estimates of the effect on the number of debt collection employees and columns 3-4 report estimates of the effect on the number of debt collection agencies. Heteroskedasticy-robust standard errors are reported in parentheses. See the text for additional details on the specification. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Establishments				Collectors per establishment			
	Level		Log		Level		Log	
Category 1	2.44		0.07*		−5.71***		−0.32***	
	(2.23)		(0.04)		(1.09)		(0.07)	
Category 2		−3.43**		−0.01		2.12		0.11
		(1.59)		(0.02)		(1.82)		(0.08)
Mean	105.31	105.31			16.49	16.49		
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	611	611	611	611	611	611	611	611
R^2	0.99	0.99	0.99	0.99	0.79	0.79	0.80	0.80

Table 3: Impact on number and size of establishments by category of law change

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on the number of debt collection establishments and the number of collectors per establishment at the state-year level. The specification is analogous to equation (1) except the law dummy is replaced with a dummy for each of two categories of law changes: (1) surety bond and licensing requirements, or (2) penalties and private remedies. All regressions include state and year fixed effects. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	1 - 50				> 50			
	Level		Log		Level		Log	
Category 1	4.05*		0.09**		−1.26**		−0.11	
	(2.21)		(0.04)		(0.58)		(0.11)	
Category 2		−3.25**		−0.01*		0.15		0.08
		(1.55)		(0.01)		(0.47)		(0.05)
Mean	94.19	94.19			11.69	11.69		
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	611	611	611	611	611	611	562	562
R^2	0.99	0.99	0.99	0.99	0.97	0.96	0.95	0.95

Table 4: Impact on number of establishments by category of law change

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on the number of debt collection establishments with less than 50 employees and with over 50 employees at the state-year level. The specification is analogous to equation (1) except the law dummy is replaced with a dummy for each of two categories of law changes: (1) surety bond and licensing requirements, or (2) penalties and private remedies. All regressions include state and year fixed effects. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	All	< 500	500 - 600	600 - 700	> 700
Auto Balance	-212.79***	-309.65**	-336.40***	-276.62**	-128.54**
	(76.43)	(154.47)	(133.52)	(100.84)	(56.89)
Mean	$3,784.88	$4,167.50	$4,343.30	$4,839.97	$3,004.62
R^2	0.42	0.36	0.38	0.40	0.45
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441
Auto Limit	-308.93***	-384.73**	-390.66***	-413.14***	-209.74***
	(98.13)	(194.22)	(160.01)	(127.07)	(76.21)
Mean	$5,841.96	$5,929.29	$6,296.32	$7,400.38	$4,860.90
R^2	0.48	0.42	0.45	0.45	0.52
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441

Table 5: Impact on auto balances and limits

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on auto loan balances and limits at the individual-year level. The first two rows report estimates for equation (2) with auto balances as the dependent variable and the next two rows report estimates for the analogous equation with auto limits as the dependent variable. All regressions include the law change dummy, and individual and year fixed effects, as well as a state-specific linear time trend. Column 1 shows the sample mean of each of the two dependent variables and column 2 reports difference-in-differences estimates using the full sample. Each of the subsequent column reports estimates for a subsample of individuals grouped by credit score in 1999. Standard errors clustered at the state level are reported in parentheses. See the text for additional details. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	All	< 500	500 - 600	600 - 700	> 700
Auto	-291.51*	-815.68***	-389.30	-357.19***	-114.80
	(167.50)	(348.91)	(239.84)	(164.11)	(141.65)
Mean	$12,338.28	$11,791.89	$12,195.07	$12,881.42	$12,222.48
R^2	0.57	0.56	0.53	0.54	0.63
N	2,126,781	117,696	388,543	689,616	930,926
Credit Card	-89.73***	-48.49***	-40.87	-102.96	-107.81*
	(38.55)	(22.67)	(27.20)	(65.60)	(59.16)
Mean	$2,029.70	$469.28	$710.63	$1,947.37	$2,913.96
R^2	0.20	0.20	0.26	0.24	0.18
N	14,978,435	804,067	2,572,800	3,958,349	7,643,219

Table 6: Impact on new origination balances

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on auto and credit card originations at the individual-year level. The first two rows report estimates for equation (2) with auto originations as the dependent variable and the next two rows report estimates for the analogous equation with credit card originations as the dependent variable. All regressions include the law change dummy, and individual and year fixed effects, as well as a state-specific linear time trend. Column 1 shows the sample mean of each of the two dependent variables and column 2 reports difference-in-differences estimates using the full sample. Each of the subsequent column reports estimates for a subsample of individuals grouped by credit score in 1999. Standard errors clustered at the state level are reported in parentheses. See the text for additional details. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	All	< 500	500 - 600	600 - 700	> 700
NT Finance Balance	-136.17	-82.06	-115.88	-135.20	-150.74
	(89.03)	(79.68)	(80.11)	(124.76)	(92.91)
Mean	\$2,224.48	\$2,010.29	\$2,202.95	\$2,944.30	\$1,873.82
R^2	0.39	0.37	0.34	0.37	0.41
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441
NT Finance Limit	-317.42***	-128.69	-249.39***	-304.56*	-372.76***
	(131.92)	(100.80)	(111.75)	(167.90)	(164.93)
Mean	\$5,595.74	\$2,946.77	\$3,583.38	\$6,158.50	\$6,235.38
R^2	0.41	0.21	0.33	0.38	0.44
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441

Table 7: Impact on non-traditional finance balances and limits

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on non-traditional finance balances and limits at the individual-year level. Non-traditional finance is a category of debt commonly defined in the CCP to include retail cards, personal loans, and a residual loan category. The first two rows report estimates for equation (2) with non-traditional finance balances as the dependent variable and the next two rows report estimates for the analogous equation with non-traditional finance limits as the dependent variable. All regressions include the law change dummy, and individual and year fixed effects, as well as a state-specific linear time trend. Column 1 shows the sample mean of each of the two dependent variables and column 2 reports difference-in-differences estimates using the full sample. Each of the subsequent column reports estimates for a subsample of individuals grouped by credit score in 1999. Standard errors clustered at the state level are reported in parentheses. See the text for additional details. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	All	< 500	500 - 600	600 - 700	> 700
Auto – Young	-313.15	-816.37***	-323.48	-402.07**	-92.20
	(203.44)	(304.17)	(255.25)	(205.54)	(175.65)
Mean	$12,727.40	$11,844.78	$12,299.91	$13,155.23	$12,744.42
R^2	0.53	0.54	0.52	0.54	0.52
N	1,320,852	92,479	292,590	465,365	470,418
Auto – Old	-259.52**	-895.20	-589.79*	-260.19	-142.14
	(143.00)	(653.93)	(344.09)	(254.86)	(157.69)
Mean	$11,861.01	$11,589.13	$11,861.44	$12,290.56	$11,666.78
R^2	0.65	0.62	0.58	0.54	0.72
N	805,929	25,217	95,953	224,251	460,508
Credit Cards – Young	-68.81**	-58.06***	-42.24	-90.53	-110.36
	(35.17)	(28.61)	(26.50)	(64.00)	(70.40)
Mean	$2,042.77	$463.92	$701.96	$1,998.99	$3,342.47
R^2	0.21	0.20	0.25	0.23	0.17
N	7,581,481	608,286	1,839,975	2,406,512	2,726,708
Credit Cards – Old	-104.87***	-21.74	-38.45	-118.65*	-109.29*
	(44.71)	(28.22)	(28.58)	(65.92)	(60.71)
Mean	$2,252.18	$486.01	$732.50	$1,866.75	$2,671.35
R^2	0.19	0.28	0.29	0.27	0.18
N	7,396,954	195,781	732,825	1,551,837	4,916,511

Table 8: Impact on auto and credit card originations, by age

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on auto and credit card originations by age at the individual-year level. The first four rows report estimates for equation (2) with auto originations for young (below median age) and old (above median age) individuals as the dependent variable and the next two rows report estimates for the analogous equation with credit card originations as the dependent variable. All regressions include the law change dummy, and individual and year fixed effects, as well as a state-specific linear time trend. Column 1 shows the sample mean of each of the two dependent variables and column 2 reports difference-in-differences estimates using the full sample. Each of the subsequent column reports estimates for a subsample of individuals grouped by credit score in 1999. Standard errors clustered at the state level are reported in parentheses. See the text for additional details. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	All	< 500	500 - 600	600 - 700	> 700
Credit Cards	19.63	104.67***	36.77	25.93	6.89
	(41.30)	(36.78)	(36.51)	(77.98)	(27.55)
Mean	$381.58	$692.75	$573.85	$591.45	$175.21
R^2	0.23	0.28	0.24	0.23	0.21
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441
NT Finance	25.01	80.04***	31.69	60.66	0.38
	(23.30)	(37.35)	(33.87)	(54.42)	(6.78)
Mean	$152.49	$526.33	$349.22	$182.45	$33.11
R^2	0.26	0.19	0.31	0.17	0.06
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441
Credit Score	-0.60	-2.14***	-2.09**	-1.16	0.14
	(1.01)	(0.95)	(0.97)	(1.56)	(0.83)
Mean	702.41	555.12	591.10	671.01	770.80
R^2	0.82	0.55	0.57	0.65	0.66
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441

Table 9: Impact on credit card and non-traditional finance delinquencies and on credit scores

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on delinquencies and credit scores at the individual-year level. The first two rows report estimates for equation (2) with credit card delinquencies as the dependent variable, the next two rows report estimates for the analogous equation with non-traditional finance delinquencies as the dependent variable, and the final two rows report estimates for the analogous equation with credit scores as the dependent variable. All regressions include the law change dummy, and individual and year fixed effects, as well as a state-specific linear time trend. Column 1 shows the sample mean of each of the three dependent variables and column 2 reports difference-in-differences estimates using the full sample. Each of the subsequent column reports estimates for a subsample of individuals grouped by credit score in 1999. Standard errors clustered at the state level are reported in parentheses. See the text for additional details. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

A Appendix: Additional tables

	Law Change	Law Change^{-1}	Law Change^{-5}
Income	-0.001	0.000	0.001
	(0.002)	(0.002)	(0.003)
Unemployment Rate	-0.003	-0.013	-0.005
	(0.001)	(0.010)	(0.018)
House Prices	0.001	0.001	0.000
	(0.001)	(0.001)	(0.001)
Debt Collectors	0.001	0.001	-0.001
	(0.001)	(0.001)	(0.001)
Collection Establishments	-0.003	-0.028	-0.037
	(0.029)	(0.030)	(0.074)
Payday Lenders	0.000	0.000	-0.001
	(0.001)	(0.001)	(0.001)
Payday Establishments	0.000	0.004	0.002
	(0.006)	(0.006)	(0.008)
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table A.1: Dynamics in the run-up to legislation changes

This table reports the analysis of the dynamics of various macroeconomic factors in the years preceding the reforms at the state-year level. Law Change^{-n} is an indicator that takes the value of 1 if a state will tighten legislation regarding debt collection practices in n years. All regressions include state and year fixed effects. All other variables are expressed in levels. Heteroskedasticy-robust standard errors are reported in parentheses. See the text for additional details on the specification. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	All	< 500	500 - 600	600 - 700	> 700
Credit Card Balance	2.95	103.07	0.96	21.29	-7.06
	(70.91)	(66.04)	(85.15)	(130.10)	(51.97)
Mean	$4,090.36	$2,003.34	$2,681.04	$5,809.18	$3,863.07
R^2	0.50	0.48	0.52	0.52	0.47
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441
Credit Card Limit	-140.64	-65.50	-120.65	-213.42	-120.24
	(264.96)	(120.38)	(185.99)	(334.02)	(290.02)
Mean	$16,378.54	$2,754.49	$4,487.39	$14,364.50	$22,711.06
R^2	0.70	0.33	0.52	0.70	0.67
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441

Table A.2: Impact on credit card balances and limits

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on credit card balances and limits at the individual-year level. The first two rows report estimates for equation (2) with credit card balances as the dependent variable and the next two rows report estimates for the analogous equation with credit card limits as the dependent variable. All regressions include the law change dummy, and individual and year fixed effects, as well as a state-specific linear time trend. Column 1 shows the sample mean of each of the two dependent variables and column 2 reports difference-in-differences estimates using the full sample. Each of the subsequent column reports estimates for a subsample of individuals grouped by credit score in 1999. Standard errors clustered at the state level are reported in parentheses. See the text for additional details. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	All	< 500	500 - 600	600 - 700	> 700
Mortgage Balance	-1005.99	1508.67	267.66	-1360.52	-1386.14
	(2622.58)	(1945.44)	(2314.99)	(3406.29)	(2481.81)
Mean	$39,550.16	$18,231.50	$24,114.76	$44,789.54	$44,073.41
R^2	0.63	0.52	0.55	0.60	0.65
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441
Mortgage Limit	-939.58	1567.81	352.39	-1206.04	-1376.75
	(2792.71)	(1943.73)	(2368.57)	(3538.11)	(2720.56)
Mean	$43,973.67	$19,522.30	$25,911.07	$48,750.90	$49,929.96
R^2	0.63	0.51	0.54	0.60	0.66
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441

Table A.3: Impact on mortgage balances and limits

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on mortgage balances and limits at the individual-year level. The first two rows report estimates for equation (2) with mortgage balances as the dependent variable and the next two rows report estimates for the analogous equation with mortgage limits as the dependent variable. All regressions include the law change dummy, and individual and year fixed effects, as well as a state-specific linear time trend. Column 1 shows the sample mean of each of the two dependent variables and column 2 reports difference-in-differences estimates using the full sample. Each of the subsequent column reports estimates for a subsample of individuals grouped by credit score in 1999. Standard errors clustered at the state level are reported in parentheses. See the text for additional details. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	All	< 500	500 - 600	600 - 700	> 700
Auto Balance – Young	-307.72***	-348.31***	-286.68**	-346.68***	-252.75***
	(111.42)	(159.94)	(141.70)	(124.56)	(81.17)
Mean	$4,801.20	$4,360.21	$4,622.19	$5,474.24	$4,418.46
R^2	0.39	0.36	0.38	0.38	0.40
N	9,828,793	775,576	2,300,030	3,151,006	3,602,181
Auto Balance – Old	-119.40***	-218.99	-259.72*	-219.69***	-58.14
	(51.56)	(151.00)	(134.15)	(96.33)	(44.85)
Mean	$2,728.28	$3,586.13	$3,653.25	$3,853.25	$2,189.85
R^2	0.46	0.37	0.40	0.44	0.48
N	9,612,497	261,013	940,981	2,044,243	6,366,260
Auto Limit – Young	-432.42***	-431.21**	-405.59***	-472.92**	-398.46***
	(141.49)	(204.71)	(178.88)	(160.73)	(121.59)
Mean	$7,263.56	$6,142.11	$6,631.41	$8,272.88	$7,025.66
R^2	0.44	0.41	0.44	0.42	0.47
N	9,828,793	775,576	2,300,030	3,151,006	3,602,181
Auto Limit – Old	-183.44***	-283.11	-364.65***	-318.31***	-103.00*
	(62.99)	(183.33)	(147.66)	(117.13)	(61.75)
Mean	$4,365.72	$5,287.23	$5,467.23	$6,043.03	$3,613.41
R^2	0.53	0.45	0.47	0.51	0.54
N	9,612,497	261,013	940,981	2,044,243	6,366,260

Table A.4: Impact on auto balances and limits, by age

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on auto loan balances and limits by age at the individual-year level. The first four rows report estimates for equation (2) with auto balances for young (below median age) and old (above median age) individuals as the dependent variable and the next four rows report estimates for the analogous equation with auto limits as the dependent variable. All regressions include the law change dummy, and individual and year fixed effects, as well as a state-specific linear time trend. Column 1 shows the sample mean of each of the two dependent variables and column 2 reports difference-in-differences estimates using the full sample. Each of the subsequent column reports estimates for a subsample of individuals grouped by credit score in 1999. Standard errors clustered at the state level are reported in parentheses. See the text for additional details. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	All	< 500	500 - 600	600 - 700	> 700
NT Finance Balance – Young	-153.42*	-92.80	-97.30	-153.99	-203.36
	(91.52)	(85.22)	(77.92)	(113.56)	(112.86)
Mean	$2,423.58	$1,875.21	$2,079.36	$2,892.91	$2,350.89
R^2	0.35	0.35	0.32	0.32	0.37
N	9,828,793	775,576	2,300,030	3,151,006	3,602,181
NT Finance Balance – Old	-118.18	-72.55	-165.19	-101.39	-120.58
	(109.79)	(96.36)	(123.29)	(184.14)	(97.26)
Mean	$2,013.27	$2,417.78	$2,508.73	$3,024.26	$1,598.90
R^2	0.42	0.41	0.36	0.45	0.44
N	9,612,497	261,013	940,981	2,044,243	6,366,260
NT Finance Limit – Young	-301.52***	-142.87	-278.48***	-274.79*	-417.05**
	(124.98)	(102.32)	(101.43)	(155.06)	(202.91)
Mean	$5,423.50	$2,742.52	$3,360.39	$5,896.21	$6,904.54
R^2	0.35	0.17	0.29	0.34	0.38
N	9,828,793	775,576	2,300,030	3,151,006	3,602,181
NT Finance Limit – Old	-324.83***	-123.88	-178.83	-344.59	-345.57***
	(150.24)	(120.72)	(167.62)	(233.65)	(149.95)
Mean	$5,772.25	$3,562.92	$4,135.12	$6,566.54	$5,849.76
R^2	0.46	0.44	0.41	0.44	0.47
N	9,612,497	261,013	940,981	2,044,243	6,366,260

Table A.5: Impact on NT finance balances and limits, by age

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on non-traditional finance balances and limits by age at the individual-year level. Non-traditional finance is a category of debt commonly defined in the CCP to include retail cards, personal loans, and a residual loan category. The first four rows report estimates for equation (2) with non-traditional finance balances for young (below median age) and old (above median age) individuals as the dependent variable and the next four rows report estimates for the analogous equation with non-traditional finance limits as the dependent variable. All regressions include the law change dummy, and individual and year fixed effects, as well as a state-specific linear time trend. Column 1 shows the sample mean of each of the two dependent variables and column 2 reports difference-in-differences estimates using the full sample. Each of the subsequent column reports estimates for a subsample of individuals grouped by credit score in 1999. Standard errors clustered at the state level are reported in parentheses. See the text for additional details. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	All	< 500	500 - 600	600 - 700	> 700
Auto	-10.31***	-26.43	-21.90*	-11.86**	-2.18*
	(4.58)	(17.42)	(12.54)	(6.05)	(1.14)
Mean	$135.34	$469.91	$343.13	$155.42	$21.64
R^2	0.14	0.14	0.13	0.13	0.12
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441
Credit Card	-5.77	-6.74	-12.93	-9.81	0.72
	(4.42)	(15.91)	(10.83)	(8.35)	(2.02)
Mean	$146.46	$440.30	$324.99	$186.82	$35.90
R^2	0.12	0.13	0.12	0.11	0.10
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441
NT Finance	-8.18*	-5.33	-15.26	-14.55***	-1.10
	(4.76)	(17.81)	(13.26)	(5.73)	(2.76)
Mean	$130.20	$430.17	$316.39	$156.25	$24.04
R^2	0.11	0.12	0.11	0.11	0.09
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441

Table A.6: Impact on early stage delinquent balances

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on early stage delinquent balances (up to 60 days delinquent) at the individual-year level. The first two rows report estimates for equation (2) with early stage auto delinquencies as the dependent variable, the next two rows report estimates for the analogous equation with early stage credit card delinquencies as the dependent variable, and the final two rows report estimates for the analogous equation with early stage non-traditional finance delinquencies as the dependent variable. All regressions include the law change dummy, and individual and year fixed effects, as well as a state-specific linear time trend. Column 1 shows the sample mean of each of the three dependent variables and column 2 reports difference-in-differences estimates using the full sample. Each of the subsequent column reports estimates for a subsample of individuals grouped by credit score in 1999. Standard errors clustered at the state level are reported in parentheses. See the text for additional details. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	All	< 500	500 - 600	600 - 700	> 700
Auto	0.59	-26.54	11.16	-3.37	0.88
	(18.30)	(60.27)	(40.04)	(17.11)	(3.07)
Mean	$132.56	$561.06	$374.84	$121.13	$144.37
R^2	0.25	0.27	0.26	0.22	0.20
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441
Credit Card	20.40	111.81***	39.84	24.43	7.32
	(43.56)	(37.68)	(37.91)	(81.00)	(29.72)
Mean	$376.23	$680.27	$563.30	$579.20	$175.96
R^2	0.23	0.28	0.23	0.22	0.21
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441
NT Finance	29.76	96.61***	27.30	77.23	0.74
	(28.69)	(43.00)	(38.12)	(68.96)	(9.03)
Mean	$168.56	$559.38	$379.32	$204.13	$39.85
R^2	0.26	0.20	0.31	0.19	0.18
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441

Table A.7: Impact on late stage delinquent balances

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on late stage delinquent balances (90 days delinquent, 120 days delinquent, or severely derogatory) at the individual-year level. The first two rows report estimates for equation (2) with late stage auto delinquencies as the dependent variable, the next two rows report estimates for the analogous equation with late stage credit card delinquencies as the dependent variable, and the final two rows report estimates for the analogous equation with late stage non-traditional finance delinquencies as the dependent variable. All regressions include the law change dummy, and individual and year fixed effects, as well as a state-specific linear time trend. Column 1 shows the sample mean of each of the three dependent variables and column 2 reports difference-in-differences estimates using the full sample. Each of the subsequent column reports estimates for a subsample of individuals grouped by credit score in 1999. Standard errors clustered at the state level are reported in parentheses. See the text for additional details. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	All	< 500	500 - 600	600 - 700	> 700
Any Delinquency	0.62	2.27***	1.76*	0.73	0.11
	(0.53)	(0.95)	(0.84)	(0.89)	(0.25)
Mean	12.69	44.85	32.21	13.97	2.33
R^2	0.43	0.34	0.32	0.34	0.31
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441
Early Delinquency	0.02	0.11	0.05	0.08	0.03
	(0.13)	(0.33)	(0.23)	(0.23)	(0.04)
Mean	5.37	15.00	11.61	7.09	1.45
R^2	0.20	0.19	0.18	0.18	0.17
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441
Late Delinquency	0.62	2.39***	1.74**	0.74	0.10
	(0.53)	(0.98)	(0.86)	(0.88)	(0.25)
Mean	12.05	43.69	30.97	13.06	2.11
R^2	0.44	0.35	0.33	0.35	0.32
N	19,441,290	1,036,589	3,241,011	5,195,249	9,968,441

Table A.8: Impact on likelihood of any delinquency, early or late

This table reports difference-in-differences estimates of the effect of state-level changes in legislation regarding debt collection on the likelihood of having delinquent balances at the individual-year level. The first two rows report estimates for equation (2) with a dummy that equals one if the individual has any delinquent balances as the dependent variable, the next two rows report estimates for the analogous equation with a dummy for the presence of early delinquent balances (up to 60 days delinquent) as the dependent variable, and the final two rows report estimates for the analogous equation with a dummy for the presence of late delinquent balances (90 days delinquent, 120 days delinquent, or severely derogatory) as the dependent variable. All regressions include the law change dummy, and individual and year fixed effects, as well as a state-specific linear time trend. Column 1 shows the sample mean of each of the three dependent variables and column 2 reports difference-in-differences estimates using the full sample. Each of the subsequent column reports estimates for a subsample of individuals grouped by credit score in 1999. Standard errors clustered at the state level are reported in parentheses. See the text for additional details. Symbols *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.