Does Increasing Access to Formal Credit Reduce Payday Borrowing?

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ABSTRACT

This paper provides new evidence of substitution between "alternative" and "traditional" credit by exploiting an unexpected positive shock to traditional credit access among payday loan borrowers: the removal of a Chapter 7 bankruptcy flag. We find that the removal of a bankruptcy flag on a credit report results in a sharp increase in access to traditional credit and raises credit scores, credit card limits, and approval rates. However, despite meaningful increases in access to traditional credit, we find that borrowers do not reduce their use of payday loans, and instead increase the use of other alternative credit products.

I.   Introduction

The use of high-cost "payday" loans by low income borrowers has generated substantial concern among policymakers. Some regulators point to studies that show payday loan borrowers are extremely credit constrained and argue subprime borrowers are driven to use payday loans because their access to traditional credit products is limited (e.g. Bhutta, Skiba, and Tobacman (2015)). These regulators view policies to encourage banks and credit unions to extend credit to low income, high risk clientele as a way to reduce the use of these payday loan products.[1] At the same time, other studies find that some borrowers puzzlingly take out high-interest payday loans even when they have less expensive credit card liquidity available. If borrowers are taking out payday loans for other reasons than credit constraints, improving access to traditional credit may not actually change payday loan borrowing behavior.[2] Identifying the causal impact of improved credit access is challenging, as those with higher credit scores or credit card limits likely vary on unobservable dimensions such as delinquency risk, financial knowledge, or other characteristics that may affect the propensity of these borrowers to use payday loan products. Addressing this question has also been difficult empirically because the use of subprime products such as payday loans are not reported on standard credit reports. Analyzing the impact of credit access on payday borrowing behavior requires linking information on subprime credit behavior with information on traditional credit activity, as well as a source of exogenous variation in traditional credit access.

In this paper, we address this empirical challenge by linking a new administrative panel of payday loan and other "alternative" credit borrowers with their traditional credit reports. Using this linked panel, we are able to implement an identification strategy that exploits an exogenous positive "shock" to traditional credit access: the removal of a bankruptcy flag from a borrower's credit report. The Fair Credit Reporting Act requires credit bureaus to remove Chapter 7 flags after 10 years, generating a sharp increase in credit scores at the date of the flag removal. We analyze Chapter 7 rather than Chapter 13 filings in order to focus on low income borrowers who are more likely to take up alternative lending products.[3] Previous research has found that the removal of

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[1]See, for example, "Banks Urged to Take On Payday Lenders With Small, Lower-Cost Loans" https://www.nytimes.com/2018/02/16/your-money/banks-payday-loans.html.

[2]For example, studies find some borrowers use payday loans even when they are able to borrow on their credit card at much lower rates, and point to possible explanations of lack of knowledge or self-control (Pagel and Olafsson (2016), Agarwal, Skiba, and Tobacman (2009), Melzer (2011)).

[3]The Bankruptcy Abuse Prevention Act imposed income means testing for Chapter 7 filings in 2005, in order

these flags immediately increases credit scores and results in higher credit limits and higher approval rates (Gross, Notowidigdo, and Wang (2018); Dobbie et al. (2017); Dobbie, Goldsmith-Pinkham, Mahoney, and Song (2019); Musto (2004)).[4] Studies have also found that bankruptcy flag removals have a precise zero impact on labor market outcomes (Dobbie et al. (2019)), allowing us to rule out income effects. Thus with this newly linked panel, our work provides the new evidence as to whether improving access to "traditional" credit reduces payday borrowing.

We obtain payday and alternative credit outcomes from an "alternative" credit bureau, Clarity Services ("Clarity"), that specializes in provides underwriting services for the subprime consumer population, including those with typically thin or no file credit reports.[5] We link individuals in the Clarity database from 2013 to 2017 with their standard credit reports from Experian, one of the three major credit reporting agencies. These linkages allow us to see changes in both traditional and non-traditional credit product use that occurs around the time a bankruptcy flag is removed. Our data follows borrowing behavior through 4 years following the flag removal, allowing us to see longer term outcomes. Our final sample includes 30,246 alternative credit users who have had a Chapter 7 removal over our sample period. Our population of alternative credit users has limited credit access and faces higher credit constraints relative to the average borrower. The average alternative credit user in our sample has a total revolving credit limit of less than $2000 and has used over 80 percent of their available credit, whereas the typical credit card borrower has an average total limit of $18,000 and has only used approximately 54 percent.

Using data from the traditional credit reports, we first confirm that bankruptcy flag removal did create a positive shock to credit access among our sample. Credit scores jump sharply by approximately 7 points upon flag removal, and continue to be approximately 6 to 7 points above pre-flag removal trends at the end of four years. Consistent with prior studies, we find that this jump in credit scores results in a corresponding increase in credit limits and credit approvals. The total amount of credit available on credit cards increases to $63 immediately upon the removal

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to shuttle higher income borrowers into Chapter 13 filings instead. While prior studies such as Dobbie, Keys, and Mahoney (2017) have used both Chapter 7 and Chapter 13 filings, their data filings are pre-2005, and thus before the Bankruptcy Abuse Prevention Act would have been imposed. While it is possible some higher income borrowers could take advantage of exceptions to still file Chapter 7, we limit our sample to Chapter 7 to account for this change in law.

[4]Due to the obscurity of bankruptcy flags on credit reports, survey evidence has demonstrated that the removal of these flags are unexpected by borrowers (Gross et al., 2018).

[5]Clarity Services is now a subsidiary of Experian, our standard credit bureau data source. https://www.clarityservices.com/about-us/

of a bankruptcy flag and to about $500 higher than the pre-flag removal mean by the end of four years. This represents an approximately 25% increase in credit card limits by the end of our sample period. We also observe significantly higher approval rates for credit applications, which increase by about 8% immediately and by about 14% by the end of our sample period. These results suggest that the flag removal did indeed make it easier for the subprime borrowers in our sample to borrow through traditional credit channels.

Despite the clear improvement in access to mainstream credit, we do not observe any reduction in payday loan usage. Our confidence intervals allow us to rule out decreases in monthly payday borrowing of more than 4% (about $1.23) in the first year and more than 2% (about $0.50) by the end of our sample period. Furthermore, we find monthly credit applications for payday loans actually *increase* by 0.02 applications in the first year and continue to increase to 0.14 applications over the pre-flag removal trend by the end of four years. Furthermore, we simultaneously find that the applications and amount borrowed in online installment loans, a longer-term form of subprime credit, increased significantly post flag-removal. These results hold across a variety of specifications, sample definitions, measures of payday borrowing, and empirical approaches, as well as across many subgroups. In summary, we do not find that the improved access to less expensive, traditional credit meaningfully reduced use of "alternative" credit products captured in our dataset; if anything, consumers increased their use of some types of alternative products for which they might not have otherwise qualified.

This result is puzzling for policies aimed at reducing payday loan usage by increasing access to traditional credit. We explore three potential explanations for why we do not observe any reductions on payday borrowing: (1) the increase in credit score is insufficient to reduce alternative credit use, (2) borrowers are targeted by increased credit marketing offers post-flag removal, and (3) alternative credit users have a cash need that cannot be substituted with traditional credit such as loans or credit card borrowing. We find that the magnitude of credit access increases does not have any impact on reducing payday loan usage. Even subgroups that experience very large increases in credit scores of 30 to 40 points do not reduce their payday loan usage and still increase their use of subprime installment loans. We find that there are small, but statistically significant, increases in the marketing of "pre-approved" payday loans and online subprime installment loans to subprime borrowers following a bankruptcy flag removal. Finally, we discuss how the need for

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cash for some expenses–such as to pay rent or repay informal loans from friends or family–may be driving our sample's use of these high cost products.

Our results suggest that regulatory efforts to increase access to traditional credit may not be successful at reducing payday loan borrowing unless they are quite substantial (generating larger increases in credit access than those studied here) or they are coupled with other interventions (such as information interventions, cash transfers, or other types of social support).

II.   Related Literature and Theoretical Framework

The academic literature on payday lending has been mixed, and the regulatory response to payday lending has remained politically charged. Most recently the Consumer Financial Protection Bureau revoked its earlier restrictions on payday lenders implemented in 2017.[6] Consumer advocacy groups decried this reversal as stripping needed protections for consumers, while the CFPB defended its decision as an effort to improve credit options for borrowers who otherwise lack traditional credit access.[7] The payday lending industry has boomed from a relatively sparse market of single storefronts to lending \$38.5 billion in short-term credit to approximately 19 million U.S. borrowers over the last two decades. Its practices have attracted significant scrutiny and debate from regulators given the high interest rates of its products and the subprime population it services. At the same time, advocates for the payday loan industry point to the limited credit access its borrowers otherwise would have and cite its credit products as providing much needed credit relief for highly constrained borrowers.

Payday loans are not regulated by the Fair Credit Reporting Act, and therefore any application or activity with a payday lender has no impact on a borrower's credit score. Payday lenders will, however, request credit checks on applications from alternative credit bureau agencies that specialize in tracking payday loan borrower behavior. Payday loans are short-term (often around 2 weeks), non-collateralized small loans typically ranging from as little as \$25 to \$300. These loans typically come with very high fees translating from 300% to upwards of 600% when expressed as

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[6]See https://www.npr.org/2020/07/07/888499021/cfpb-strips-some-consumer-protections-for-payday-loans. See https://www.lexology.com/library/detail.aspx?g=896c71f9-8b78-4b27-b4b5-8a75a40bfd55 for a brief history of the CPFB payday lending rule.

[7]https://www.npr.org/2019/02/06/691944789/consumer-protection-bureau-aims-to-roll-back-rules-for-payday-lending

an annualized interest rate. Near the end of the two-week term, payday loans commonly come with roll over features in which the borrower can extend her loan by paying fees from the original loan and borrowing against the next paycheck. Qualifying for a payday loan presents relatively few barriers. Borrowers often simply need to provide evidence of a pay stub or a Social Security check as income evidence and a checking account.

Payday and installment loans are offered both in storefront and online. Figure A1 provides an example of a website of an online payday lender. The website emphasizes the ease in applying to its prospective borrowers, and reminds that applying in no way impacts a borrower's credit score. Online lending in particular has been responsible for the most growth in subprime credit products in recent years.[8] More recently, payday lenders have also offered subprime installment loans as an alternative credit product to borrowers. These loans offer repayment in a series of installments rather than a single payment option within payday loans. These loans are therefore also larger in magnitude, ranging from \$500 to \$5000, but also come with high interest rates often exceeding 50%. Critics have argued that these subprime installment loans are offered as a way to get around regulations of payday lending in certain states.[9] Installment loans are otherwise similarly uncollateralized, short-term with high-interest like payday loans, with some lenders marketing installment credit products as "payday consolidation loans."

A number of studies do show that payday borrowers are highly credit constrained, suggesting they only borrow at such high-interest rates because they lack traditional market alternatives. Bhutta et al. (2015), for example, find that borrowers apply for payday loans when they have limited access to mainstream credit and severely poor credit histories. In a comprehensive survey of payday customers, Lawrence and Elliehausen (2008) find that more than two-thirds turned to payday lenders after being turned down by a traditional creditor and nearly all were fully aware of the finance charges associated with the loans. Using natural disasters as an exogenous shock, Morse (2011) examines the causal effect of payday lenders on welfare and finds that payday lending mitigates foreclosures and larcenies in personal emergency situations. Some policy evaluations have found that restricting access to payday loans either has no effect (Carter and Skimmyhorn, 2017)

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[8]Online lending has increased 20 percent in volume and 19 percent in revenue from 2006 to 2011 whereas storefront payday loan volume has decreased 7 percent in volume and 6 percent in revenue Nunez, Schaberg, Hendra, Servon, Addo, and Mapillero-Colomina (2016).

[9]See https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2016/08/from-payday-to-small-installment-loans.

or a deleterious effect (Zinman, 2010) on borrowers' well-being. These studies suggest without a source of traditional credit market access, eliminating payday options would shut down a much needed alternative source of financing for these borrowers.

At the same time, several other studies have found that payday borrowers do appear to have access to liquidity. For example, Agarwal et al. (2009) find that payday borrowers have substantial liquidity on their credit cards on the days they take out a payday loan. In another survey of payday borrowers, Bertrand and Morse (2011) find that many respondents use loans for spending such as vacations, restaurants, electronics, and gifts. Using a detailed administrative dataset from Iceland, Pagel and Olafsson (2016) similarly find evidence that some payday borrowers are sufficiently liquid to borrow money less expensively and spend payday loans on "temptation" items. The authors conclude that for some borrowers self-control or poor information are proximate causes of payday borrowing, rather than liquidity constraints. Bertrand and Morse (2011) and Burke, Leary, and Wang (2016) find that disclosing better information to payday borrowers reduces the take up of payday loans significantly. Melzer (2011) finds that access to payday loans actually make it more difficult for borrowers to pay other bills such as mortgages. Carrell and Zinman (2014) find reduced job performance among military members associated with payday loan access. These studies raise concerns that without proper regulation, payday lenders could mislead borrowers into taking out loans unaware of high fees and adverse consequences on their credit.

The challenge in reconciling these sets of studies is that a borrower's payday loan activity is not observed in credit bureau data. Thus, data limitations make it difficult to observe substitutions between the traditional and alternative credit markets. We address this data limitation by directly linking households' payday borrowing with their traditional credit data. By doing so, we can observe exogenous shocks to borrowers' traditional credit access and examine their payday borrowing activity. Following Musto (2004), Dobbie et al. (2017), Gross et al. (2018), Dobbie et al. (2019), and Herkenhoff, Phillips, and Cohen-Cole (2016), we utilize the removal of bankruptcy flags on credit reports as a shock to credit access. In the U.S., when borrowers file for either Chapter 7 or Chapter 13 bankruptcy, a "red flag" is recorded on their credit report. This results in a significant decline in their credit score and restricted access to traditional credit cards, banking accounts, loans, internet, housing, and any other service requiring a prime credit score. The Fair Credit Reporting Act, however, requires that credit bureaus remove bankruptcy flags after ten years. The removal of

a bankruptcy flag results in a sudden jump in credit score, opening up access to traditional credit again. Musto (2004) finds sharp short run effects on credit scores and credit limits. Gross et al. (2018) and Dobbie et al. (2019) find that bankruptcy flag removals lead to not only an immediate but a persistent increase in credit scores, as well as credit card limits and credit card balances. Dobbie et al. (2019) examine effects of bankruptcy flag removals on employment, and find zero to negligible effects on employment and earnings. We contribute to this line of literature as the first to be able to finally examine the impact of credit access on payday and other alternative lending products.

A. Theoretical Framework

Following Argyle, Nadauld, and Palmer (2020), we describe a theoretical framework to discuss and interpret our empirical findings. We revisit standard optimization models to formalize the substitution decision between the traditional and payday lending credit market facing our constrained borrower.

We first consider the unconstrained consumer choosing optimal consumption, c_t and assets A_t to maximize the utility function $u(c_t)$ subject to a budget constraints where her assets and income, y_t, are equal to consumption and assets next period. Thus, the consumer maximizes the following Lagrangian:

$$max_{c_t, A_t} \sum_t \beta^t [u(c_t) + \lambda_t (A_{t-1}(1+r) + y_t - c_t - A_t)] \tag{1}$$

where β is the discount factor, λ_t is the Lagrangian multiplier or marginal utility of wealth, and the budget constraint is equal to $A_{t-1}(1+r) + y_t = c_t + A_t$. This standard set up results in the traditional Euler equation:

$$\frac{u'(c_t)}{u'(c_{t+1})} = \beta(1+r) \tag{2}$$

Without any credit constraints, the consumer is free to choose an optimal consumption path to satisfy the above first-order condition. However as we note above, the subprime consumer we are concerned with in this study faces credit constraints.

Suppose the credit constrained consumer faces a borrowing limit $\bar{D}$, set exogenously by the lender based on a debt yield ratio relative to the borrower's income. The consumer then maximizes her utility as in (1) above, but subject to an additional credit constraint such that her debt-to-income ratio, $-A_t(1+r)/y_t$, must be less than or equal to $\bar{D}$. Thus, we can rewrite our consumer's Lagrangian as:

$$max_{c_t,A_t} \sum_t \beta^t [u(c_t) + \lambda_t(A_{t-1}(1+r) + y_t - c_t - A_t) + \mu_t(\bar{D} + A_t(1+r)/y_t)] \qquad (3)$$

where we incorporate the additional credit constraint with a second Lagrange multiplier, μ_t. This modifies her Euler equation with an additional term:

$$\frac{u'(c_t) - \mu_t(1+r)/y_t}{u'(c_{t+1})} = \beta(1+r) \qquad (4)$$

If $\mu_t = 0$, then the credit constraint is not binding and we can achieve first-best optimal consumption. For our subprime consumer, however, μ_t is likely greater than zero, and she will be forced to choose a lower level of consumption such that (4) is satisfied.

We follow Argyle et al. (2020) and extend this standard framework to incorporate the consumer's loan choice to optimize their consumption. Suppose our borrower is faced with a menu of consumer loans from which to choose a loan l with interest rate r_l and term T_l. We can then rewrite the consumer's maximization problem as:

$$max_{c_t,S_t,D,l} \sum_t \beta^t [u(c_t) + \lambda_t B_t^l + \mu_t(\bar{D} - m(D, r_l, T_l)/y_t)] \qquad (5)$$

where the consumer's budget constraint, B_t^l, is such that her prior savings (S_{t-1}), income, and total debt borrowed $(\bar{D})$ is greater than or equal to her consumption, current savings (S_t), and monthly payments $m(D, r_l, T_l)$ that correspond to her choice of loan l. In other words,

$$B_t^l \equiv [S_{t-1}(1+r_s) + y_t + \bar{D}^l] - [c_t + S_t + m(D, r_l, T_l)] \qquad (6)$$

Now from here, the optimal loan choice l^* can be characterized as:

$$l^* = argmin_l \sum_{t}^{t_0 + T_l} \beta^t \lambda_t m(D, r_l, T_l) \tag{7}$$

Argyle et al. (2020)'s main point here is to observe that the borrower's optimal loan contract choice is related to the present value of her recurring payments. In other words based on (7), a consumer will only consider the present value of the marginal utility lost from their required payments given the same loan size D. Thus, faced with two equally sized debt contracts, the unconstrained borrower would choose a contract with lower present value versus one with higher present value. In the case of our study, where the present value of payday versus credit card loans is primarily driven by interest rates r_l (as opposed to maturity), given the option the unconstrained borrower should easily opt for traditional credit card debt with much a much lower rate r_l^{cc} versus a payday loan with an astronomically high interest rate r_l^{payday}.

Nonetheless, we do not find this necessarily to be the case in our empirical findings. We find borrowers take out payday loans despite greater credit limits available to them in credit cards. Given the above framework, one possibility is that our borrowers may still face binding credit and budget constraints. In practice, $\bar{D}$ set by credit card lenders may still be too small even after flag-removal to support the lower bound consumption level borrowers require support next period costs, i.e.

$$[S_{t-1}(1 + r_s) + y_t + \bar{D}^{cc}] < c_t + S_t + m(D^{cc}, r_l, T_l)] \tag{8}$$

Of course, while the borrower is already forced to choose a lower consumption level c to satisfy this budget constraint, there is a lower bound of consumption level c_t. Thus in order to satisfy the budget constraint, in reality the subprime borrower's debt is more likely be comprised of both credit card and payday loan debt

$$\overline{D}_t = \bar{D}_t^{cc} + \bar{D}_t^{payday} \tag{9}$$

such that the budget constraint is essentially:

$$B_t^l \equiv [S_{t-1}(1 + r_s) + y_t + \overline{D}^l] - [c_t + S_t + m^{cc} + m^{payday}] \qquad (10)$$

Equation (6) is written as if the consumer borrows up to the exogenous credit limit that is made available to her by the lender, but in reality the amount of debt to take out, D_t, is another optimal variable choice made by the consumer to maximize her objective function, or $D^* = \overline{D}_t$. We can see from the consumers budget constraint in (6) that the optimal choice of debt to take is a balancing act between the benefits of increasing the budget at time or origination with the higher present value of future payments. The choice of reducing or continuing to take out payday loans then depends on the how much relief payday debt can bring to the borrowers budget constraint relative to the impact of its future per period debt service payments.

To summarize, this framework illustrates that unconstrained borrowers should always select lower cost credit card debt over more expensive payday loans. Among constrained borrowers, however, the prediction is less clear: constrained borrowers should reduce payday loan usage in response to higher credit card limits if the credit constraint summed across both types of products is non-binding. If credit constraints still bind even after the credit card limit is increased, consumers may still choose to borrow the maximum amount across both loan products. Finally, it is important to note that this model assumes that payday loan debt and credit card debt are identical in their ability to increase consumption and can therefore be fully characterized by the interest rate. We know this is not the case for payday loans, since taking out greater payday loan debt does not impact your credit score while traditional credit card debt does. Surveys by Nunez et al. (2016) of Clarity borrowers show that borrowers are aware of this difference and borrow accordingly. Furthermore, borrowers may also face unmeasured fixed costs of borrowing (such as an information costs) that may impact which credit product they decide to borrow.

III. Data

Because payday lending is not included on traditional credit reporting, a key empirical challenge in this literature has been observing simultaneous activity in the traditional and alternative lending

markets. To address this challenge, we utilize a panel dataset that links both traditional credit outcomes with alternative payday borrowing outcomes on the individual level.[10] In the United States, credit reports are provided by three main nationwide credit bureaus: Equifax, TransUnion, and Experian. We obtain standard credit report data for this project from Experian. Lenders use credit scores and information in credit reports to evaluate a borrower's ability to repay a loan. Each credit file contains information across the following components: trade lines, public records, collections, and inquiries (Consumer Financial Protection Bureau, 2012). Trade lines are accounts in a borrower's name furnished by lenders to the credit bureaus. Lenders generally report the type of credit (auto, mortgage, credit card), credit limit or loan amount, account balances, payment history, and defaults. These files also may include dates an account was opened or closed, whether or not an account is delinquent or in collection. The files do not contain any terms of the loans such as interest rates, points, or fees or information on a borrower's income or assets. Public records are obtained from the government and include any bankruptcies, judgements, and tax liens. Additional third-party collection items are also reported by collection agencies on behalf of lenders; note that these third-party collections are separate and in addition to the delinquent credit accounts described above. Finally, inquiries are any requests to access a consumer's credit file. Our data include all inquiries initiated by borrowers such as to apply for a credit card or open a bank account. Only these type of inquiries are incorporated into a consumer's credit score (Consumer Financial Protection Bureau (2012)).[11]

Credit scores are calculated through bankruptcy prediction models that assess the likelihood that a borrower will become over 90 days delinquent within two years. The historically known model was built by the Fair Isaac Corporation (FICO), but all models are impacted by the same borrower attributes including borrowers' payment history, delinquencies, number of accounts, and inquiries. We utilize credit scores provided by Experian's Vantage Score, a comparable and competing scoring model. Vantage Scores range from 300 to 850, and scores 600 and below indicate subprime borrowers. [12] Credit scores have a significant impact on a consumer's ability to access

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[10]Prior papers such as (Bhutta et al., 2015) address this challenge by accessing data from one payday lender and linking traditional credit reports

[11]Credit bureaus classify these as "hard" inquiries. Soft inquiries are those initiated by lenders such as for bank pre-screening offers or for marketing purposes (Consumer Financial Protection Bureau, 2012).

[12]Specifically, 300-499 is considered Deep Subprime, 500-600 Subprime, 661-780 is Prime, and 781-850 is Super Prime.

credit. Events such as delinquencies, bankruptcy filings, and foreclosures can cause a significant drop in scores that cause a lender to only offer a borrower subprime interest rates or deny a loan altogether. Filing for bankruptcy, for example, can drop FICO credit scores, which range from 501 to 900, over 200 points.[13]

Because main credit bureaus are not required by the Fair Credit Reporting Act to collect information from institutions that offer alternative lending products, payday loan outcomes have been collected by secondary market credit reporting agencies such as Clarity Services that specialize in providing underwriting and information to lenders offering alternative subprime products such as a payday loans. As with traditional credit bureaus, lenders who use Clarity's services report all loan applicant information of their borrowers to Clarity for verification.[14] Clarity then continues to then track all trade line activity on a subprime loan that is taken up by the borrower. Thus, the information in Clarity's trade line database is analogous to the information in standard credit reports. They similarly provide details on account type, balances, payment histories, and delinquencies except on alternative subprime products. This information is used by lenders who are interested in assessing default probabilities of applicants who are active in the alternative credit market. Directly following the acquisition of our dataset, Experian purchased Clarity as a subsidiary.[15]. Thus data from Clarity services can now be directly accessed through Experian, but are released with more limited detail subject to Experian's regulatory rules and restrictions.

Clarity covers over 60 million individuals, and covers over 70% of subprime consumers across the United States.[16] Clarity collects data from both storefront and online lenders. We obtain a random sample of 1 million individuals who have any record with Clarity between 2013 to 2017. Clarity provides us with information on all inquiries and tradelines associated with this sample, from which we construct monthly usage rates.[17] We then link this panel to the history of their

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[13]See Figure 1 in Consumer Financial Protection Bureau (2012) and hypothetical FICO impacts at `https://www.myfico.com/credit-education/questions/credit-problem-comparison/`.

[14]As of 2012, all identity verification and fraud detection was provided by Experian to Clarity (see: `https://www.prnewswire.com/news-releases/experian-provides-clarity-services-with-identity-verification-and-fraud-detection-capabilities-for-the-subprime-m html`).

[15]https://www.prnewswire.com/news-releases/experian-expands-lenders-visibility-and-improves-credit-access-for-responsible-borrowers-300615105.html

[16]Taken from promotional material reported on `http://www.clarityservices.com/`.

[17]While we observe the number of payday or other alternative loans taken out by a consumer, we cannot distinguish "new" loans from roll-overs of existing loans, which are common with these types of products (Allcott, Kim, Taubinsky, and Zinman, 2021a).

credit file reports from Experian from June of each year over the same period using social security and name identifiers.[18] Linking these data panels allows us to observe the effects on borrowing across both the mainstream credit market and alternative credit market across a random sample of borrowers across the United States.

A. Bankruptcy Sample

From this panel, we restrict our sample to those who have had a Chapter 7 bankruptcy removal during our sample period, 2013-2017. The Fair Credit Reporting Act requires that credit bureaus remove Chapter 7 and Chapter 13 bankruptcy flags from individual credit reports after ten years. We focus on Chapter 7 rather than Chapter 13 filings in order to focus on low income borrowers who are more likely to take up alternative lending products. The Bankruptcy Abuse Prevention Act imposed income means testing for Chapter 7 filings in 2005, in order to shuttle higher income borrowers into Chapter 13 filings instead.[19] Credit bureaus also voluntarily remove Chapter 13 flags after seven years, which is confounded by effects of when other delinquencies are removed.

Our final sample for analysis includes 30,246 "alternative credit" borrowers who appear both in the Clarity data and also have a Chapter 7 bankruptcy on their credit record that is removed over our sample period. The first three columns of Table I presents descriptive statistics for our analysis sample for the years prior to the removal of the bankruptcy flag. The average credit score among borrowers in our sample is 531, which falls in the subprime range. The average credit card limit (all credit cards combined) is approximately $1977 and average utilization, i.e., the percentage of total revolving credit being used, is over 80 percent, indicating a fairly credit constrained sample. Average monthly payday borrowing is approximately $29 (inclusive of months with zero borrowing); monthly subprime installment borrowing is similar. About 17% of borrowers have at least one payday loan in any given year in our sample, and about 40% have at least one payday inquiry (i.e. payday loan application).

In the subsequent columns of Table I, we compare the characteristics of our analysis sample with a random sample of borrowers who also have bankruptcy flags on their credit reports and a

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[18]In the main analysis, we use Experian credit report data from 2013 to 2017 so that the period of analysis is identical across the Clarity and Experian data. In the appendix, we show that the results are robust to using 2006 to 2017 Experian data, which allows us to observe a longer pre-flag removal period for some borrowers.

[19]While prior studies such as Dobbie et al. (2019) have used both Chapter 7 and Chapter 13 filings, their data filings are pre-2005, and thus before the Bankruptcy Abuse Prevention Act would have been imposed.

random sample of credit reports from Experian. Columns 4 through 6 show statistics for credit users with a bankruptcy flag from a random sample of Experian credit reports. Columns 7 and 9 show statistics for a random sample of Experian credit reports unconditional on bankruptcy flag presence. We expect that payday loan borrowers to be worse of than both the average borrower and an average borrower with a bankruptcy flag on her credit report. Columns (4) and (7) show that our bankruptcy flag sample has substantially worse access to credit, lower liquidity, and more delinquencies than a typical borrower and even relative to the typical borrower with a bankruptcy flag on her credit report. These comparisons highlight the striking difference between users of alternative subprime credit and typical borrowers. For example, on average, borrowers have credit limits across all open credit cards of about $18,182, and even borrowers with a bankruptcy flag on their credit report have credit card limits of $4,502. In contrast, our sample has a credit limit of only $1977. Similarly, utilization rates in our sample are, on average, over 80 percent, whereas they are about 54 percent in the population as a whole and 69 percent among those with a bankruptcy flag. Delinquencies exhibit similar patterns, with total balance on third party collections and amount 30 days past due or more higher in the Clarity sample relative to a typical borrower with a bankruptcy and much higher than what's observed among a typical borrower unconditional on having a bankruptcy flag.

The comparisons in Table I show that users of payday loans and other alternative credit products are meaningfully more credit constrained and delinquency prone than a typical borrower, even when compared to those with recent bankruptcies. These differences may indicate that any effect of credit access detected on this highly disadvantaged sample may not generalize to better off samples. At the same time, the sample population we use in this study is especially vulnerable and credit constrained, and may therefore be considered by policy makers to be especially disadvantaged and in need of intervention. In this sense, the treatment effect of expanded credit estimated for this particular group may be especially relevant for policymakers.

It is important to note that because payday loans are not regulated by the Fair Credit Reporting Act, Clarity only includes those loans originating from lenders who use their underwriting services. Thus while Clarity's database covers over 70% of subprime consumers across the U.S., Clarity may not include information across all subprime loans taken out by each borrower. Checking for external validity of Clarity's coverage is challenging, however, as data on payday loans has been difficult to

acquire. Nonetheless, in Table II we summarize and compare payday loan characteristics or our sample and prior studies on payday loans to provide a benchmark of comparison across studies thus far. In our sample of Clarity borrowers with bankruptcy flags, we find that the average number of payday loans per year per borrower is 6. The Consumer Financial Protection Bureau acquired payday loan data from numerous storefront payday lenders in the supervisory process and report a median of 6 payday loans per year (Consumer Financial Protection Bureau (2013), Burke, Lanning, Leary, and Wang (2014)). Bertrand and Morse (2011) and Lawrence and Elliehausen (2008) survey payday borrowers and find slightly higher averages of 9.2 and 8.3 loans per year respectively. The average loan size of our analysis sample is somewhat higher ($551) compared to prior studies, which find averages of approximately $360 of $392. Naturally, there are several differences across our sample and other samples used in the literature that may make average loan size of number of loans not directly comparable. These studies examine payday loans during earlier time periods than our study, examine payday borrowers from specific states or specific lenders, and/or only examine online or storefront lenders. Thus, because Clarity provides underwriting services across numerous lenders for more than 2/3 of U.S. subprime borrowers, we believe Clarity offers the best existing coverage of payday borrowing behavior across the United States.

Still, it is important to be aware of the limitations of the data. If not all loans borrowed are captured, effects on payday lending may be present, but not observable in our analysis. In addition, we note that online payday lenders are more present in Clarity's database as they have become more popular in recent years compared to time periods examined in prior studies and are also more likely to need external information when processing loan applications.[20]

In Figure 1, we examine the credit liquidity available to our sample of borrowers access at the time they take out a payday loan.[21] This figure shows the fraction of the sample who took out a payday loan by their average utilization rate during the 6 month period in which the payday loan fell. The majority of the borrowers appear to be highly credit constrained around the time they took out a payday loan, with about 70 percent having utilization rates at 80 percent or higher at

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[20]As an additional check, in Miller and Soo (ming) we find that payday loan usage of our Clarity analysis sample reflects a similar fraction of use in the population of subprime borrowers as reported by the Survey of Consumer Finances.

[21]Note that utilization rates are not defined for borrowers who have no source of revolving credit, as is the case for approximately 25% of the borrower by year observations in our data. We assign such borrowers a utilization value of 100 percent, as they have no credit available for use.

the time they take out a payday loan and 34 percent either having no credit cards on file or using 100 percent or greater of their available credit. This is consistent with prior studies that documents most payday loan borrowers are credit constrained (Bhutta et al., 2015).[22] The fact that payday loan borrowers have limited access to formal credit suggests that we might *a priori* expect an alleviation of that constraint to result in less payday loan usage–that is, borrowers may be using expensive payday loans as a last resort. At the same time, a substantial minority use payday loan products even with more than 20 percent of their credit card credit available and some payday loan users exhibit considerable formal credit availability at the time of the payday loan. Borrowers who use payday loans even when less expensive traditional credit is available may exhibit this behavior due to poor information about the costs of payday borrowing; as a result, changes in access to credit may be less salient for this group.

IV. Empirical Analysis

We employ an event-study framework following Gross et al. (2018), Dobbie et al. (2019) and others. Specifically, we exploit the required flag removal of Chapter 7 bankruptcy flags by the Fair Credit Reporting Act to examine the causal impact of traditional credit access on subprime borrowing outcomes. We first explore our outcomes graphically using the following nonparametric estimation:

$$y_{it} = \gamma_y + \gamma_c + \sum_{\tau=-12}^{15} \delta_\tau \mathbf{I}(r_{it} \in \tau) + \epsilon_{it} \tag{11}$$

where r_{it} indicates the month since bankruptcy flag removal. To reduce noise, we group these monthly observations into quarters, denoted τ. Coefficients δ_τ capture the changes in credit outcomes by quarter relative to the quarter of the flag removal. The parameter γ_y represents fixed effects for calendar year while γ_c represents cohort year fixed effects that indicate the year the bankruptcy was filed. This event study estimation explores how outcomes evolve around the time

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[22]This is in contrast to Agarwal et al. (2009), however, that finds two-thirds of their sample have more than $1000 in credit card liquidity when taking out a payday loan, the majority of our sample has less than $400 in credit card availability.

of the bankruptcy flag removal after accounting for contemporaneous time trends and differences across filing cohorts.

After exploring these patterns graphically, we estimate the impact of the flag removal more formally by assuming that, in the absence of a flag removal, credit outcomes would have continued to evolve along their pre-existing trend. This approach ascribes any deviation from the pre-trend to a causal impact of the flag removal. Prior studies have shown that over time, post-bankruptcy borrowers gradually build back their new credit and overall improve their financial portfolio (Han, Keys, and Li (2018), Jagniani and Li 2014). In our graphical figures, we also plot a linear estimation in the pre-flag removal period to look for any common pre-trends that may be occurring across borrowers before their bankruptcy flag is removed. Consistent with prior studies, we find pre-trends that are roughly linear for both traditional credit outcomes and alternative credit outcomes. Thus, our final specification further controls for this linear pre-trend, represented by αt:

$$y_{it} = \alpha t_{pre} + \gamma_y + \gamma_c + \sum_{y=1}^{4} \delta_y \mathbf{I}(r_{it} \in y) + \epsilon_{it} \tag{12}$$

We implement this pre-trend specification by excluding the pre-flag removal event time indicators in equation (11) and instead including a linear "time to removal" term, denoted t_{pre}. This term should account for any pre-existing linear time trend (Gross et al., 2018). Coefficients δ_y estimate the impact of bankruptcy flag removal on credit outcomes relative to how these outcomes would have progressed otherwise, while removing any common calendar time and mean effects across cohorts. We group these indicators into year (y), rather than reporting them by quarter or month, for the ease of reporting.

The interpretation of our event study design also assumes bankruptcy flag removals are an exogenous shock to credit supply that is unanticipated by borrowers. Because credit bureaus are required by the FCRA to remove flag at a set period, consumers might anticipate this removal by applying for new credit in the months immediately leading up to the flag removal. Because of the obscurity of credit reporting, however, most consumers may not even be aware of upcoming flag removals and survey evidence is consistent with the idea that these removals are a surprise to borrowers (Gross et al., 2018). Nonetheless, we can empirically test to see if borrowers anticipate flag removals by looking for a gap in the number of inquiries in the months leading up to flag

removals. As we describe in the our following results, we do not find evidence of borrowers shifting the timing of their credit card applications in anticipation of the flag removal.

We conduct several "robustness checks" to confirm that our results are not sensitive to model specification or sample choices. We examine whether the results change if we include individual fixed effects in lieu of cohort fixed effects, include year by month (rather than year) fixed effects for the Clarity data,[23] cluster the standard errors at the level of the bankruptcy month and year cohort rather than the individual, if we expand the sample period in the Experian data to include years through 2007, and if we use a "control group" of bankruptcy filers whose flags were removed outside of our sample period to identify the year fixed effects in our model. These robustness checks yield results that are similar to those reported in our main specification. We discuss and report these in the Appendix, rather than the main text.

A. *Impact of Bankruptcy Flag Removals on Traditional Credit Outcomes*

We first examine the impact of bankruptcy flag removals on the total number of bankruptcies and credit scores. Figure 2 first plots the impact of bankruptcy flag removals on total bankruptcies and credit scores. Each point represents an estimated event study coefficient, denoted δ_τ in equation (11). The x-axis in these figures denote the number of quarters since the removal of the bankruptcy flag, with 1 representing the quarter in which the flag is removed (dashed line). The dotted line in each plot is a linear fit to the pre-flag removal data. Consistent with a deterministic relationship with bankruptcy flag removal, we observe a sudden drop in the number of bankruptcies on a consumer's credit report. Table III reports the corresponding estimates of average the change by year, i.e., δ_y from equation (1). We find that the number of bankruptcies on a consumer's report falls significantly by about 0.886 in year 1, and remains lower by about 1 by year 4. Note that the number of bankruptcies does not always drop to 0, as borrowers can have multiple bankruptcies on their report.

We also observe an equally sharp increase in consumers' credit scores. The second panel of Figure 2 shows a sudden jump in credit score of an approximately 7 to 8 points. Table III reports that credit scores increase significantly by an average of 7.1 points in the first year. This increase

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[23]Note that since we only observe one month of data per year for the Experian data, including year fixed effects is equivalent to including year by month fixed effects.

remains high throughout our sample period, and is on average 6 points higher than the pre-flag removal trend in year 4. These magnitudes are on par with magnitudes found in Dobbie et al. (2019) (who find an initial jump of 9 points) and Gross et al. (2018) (who estimate a jump of 15 points). We would expect the difference in our estimates to be smaller, however, due to the subprime population we examine in our study.[24] The impacts on credit score remain elevated and statistically significant throughout our post flag-removal period. These "first stage" results show that removal of bankruptcy flag does indeed mechanically drop the number of bankruptcies and provide sudden increase in credit access via credit scores.

We proxy lender approval rates with the number of new accounts opened per credit inquiry. Like credit limits, we find trades per inquiry exhibit a small jump in the first year post flag-removal and larger increases going forward. Estimates in Table III show that these increases are still significantly higher than the pre-flag trend, in which lender approvals jump by 0.032 per inquiry in year 1 and then to 0.06 per inquiry by year 3 and 0.054 by year 4. This translates to an increase in approval rates of about 8% in the first year and about 14% by the end of our sample period, and implies about 0.26 more accounts per year on average being approved relative to the pre-flag removal period.[25]

The third plot in Figure 3 shows the impact of flag-removal on the number of credit inquiries. Inquiries are recorded when consumers submit applications for traditional credit products, and a lender requests a credit check to review an applicant's credit. Note that credit applications are often submitted in response to direct mail offers or targeted advertising, so examining inquiries combines effects coming from both borrower demand and lender supply. Figure 3 shows a jump in total number of inquiries post flag-removal, indicating that consumers are submitting more applications for traditional credit products. Importantly, the plot does not show evidence of a jump in demand in any months prior to flag removal, indicating borrowers are not shifting their demand for credit in anticipation of their bankruptcy flag being removed from their credit report. Estimates in Table III show that credit inquiries are significantly elevated the first year after the flag removal, but with only marginal ($p < 0.10$) increases in year 2 and no significant increases in years 3 and 4. Our data

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[24]Dobbie et al. (2019) examine Chapter 13 filers which on average have higher incomes and Gross et al. (2018) analyze a representative sample of chapter 7 filers.

[25]We arrive at 0.26 as $12 \times (0.054 \times (0.385 + 0.014)$, where 0.06 is in the increase in trades per inquiry, 0.385 is the pre-flag removal average number of inquiries in a 30 day period, and 0.014 is the direct impact of the flag removal on monthly inquiries. This is multiplied by 12 to arrive at an annual, rather than monthly, number.

likely underestimates inquiries, however, as lenders do not necessarily report every inquiry made. Auto and credit card inquiries in particular are often only reported to one or two credit bureaus.

Our analysis of credit limits and approvals indicate a sustained increase in availability of formal credit for our sample of subprime borrowers. Given this increase in credit, we explore whether this subsequently impacts borrowers' use of formal credit. In Figure 3, we plot the impact of flag removal on borrowers credit card balance. As their credit limits increase each year, we find borrowers utilize their credit availability by taking out more credit each year. Our estimates in Table III show that credit card balances on average increase $50 in the first year, and increases to $340 over the pre-flag removal trend by year 4. The final plot in Figure 3 examines credit utilization – the ratio of balance to available credit. Borrowers at 100% utilization are "maxed out" and have no remaining revolving credit to use. Figure 3 shows that initially post flag-removal credit utilization patterns do not differ from their pre-flag removal trend, and by the third year utilization looks like it begins to flatten and decline relative to the pre-removal trend. Our estimates in Table III match these patterns, where estimates are not significant across the first three years and then negatively significant in year 4. In other words, we find that borrowers start by using the increased credit liquidity they receive, and this also translates into improved liquidity across their credit cards in the longer-term. Our estimates are consistent with a pattern of increased availability and steady use of "traditional" credit card credit.

We also observe that the removal of a bankruptcy flag results in more borrowing across other types of loans. The top panel of Figure 4 plots the number of auto loans and mortgages borrowed post flag-removal. As we might expect for our subprime sample of borrowers, we find a sharp effect on auto loan activity but a lesser impact on number of mortgage loans taken out. The number of mortgages does not change immediately after the removal of the flag, although it appears to trend upwards two or three years after the flag is removed. This is consistent with prior studies that document and CFPB's recent concerns over high activity of subprime borrowers in the auto loan market (Adams, Einav, and Levin (2009), Berger, Butler, and Mayer (2016)). These patterns are reflected in our estimated in Table III, which finds that the number of auto loans increases by 0.07 in the first year and 0.24 by year 4. Our estimates on mortgage loans are negative but essentially zero in magnitude.

Even with greater credit usage, we find that increased credit access reduces the amount overdue

our sample of borrowers hold. Access to credit may have a causal impact on a borrower's ability to remain current on their accounts if it allows them to smooth over negative shocks to earnings or expenses. The bottom panel of Figure 4 displays changes in total balance of third party collections amount past due 30 days or more at the time of the flag removal and documents a visible negative change in trajectory post-flag removal. Third party collections occur when creditors are unable to collect on a debt and sell it to a third party. A bit more than one third of such collections are medical bills, but utility bills, cell phone bills, or extremely derogatory credit card bills may also be included. Table III reports significant reductions in collections of nearly $300 in the first year, $500 in the second year, and $817 by year 4. Relative to a pre-flag removal mean of $3501, this represents a 23% reduction in total collections.[26]

We do not, however, find significant reductions in the amounts past due over 30 days. This debt includes only credit accounts such as loans or credit cards and excludes bills like utilities or hospital bills. It also excludes accounts that have been turned over to third party collections, and instead captures delinquencies that are between 30 and, typically, 180 days past due. Figure 4 shows the amount in debt in third party collections and the amount of debt 30 days or more past due are perhaps slightly lower than their pre-flag removal trend, but the effects appear to be, if anything, quite small. The plots in Figure 4 suggest that overall delinquencies and debts were already in a declining trajectory pre-flag removal and traditional credit access had minimal, if any impact on lowering amounts past due. Estimates in Table III are negative, but none are statistically different than zero.

B. Impacts of Flag Removal on Subprime Borrowing

Now that we have established that our sample of borrowers experience an increase in formal credit access and use, we address the question of whether this reduced their use of high cost alternative credit products. We first examine whether flag removal impacts payday loan borrowing. The top graph in Figure 5 plots the flag removal impact on payday loan inquiries. We do not find evidence that increasing access to formal credit reduced payday loan applications. Table IV reports the corresponding estimates and show that, in fact, payday inquiries *increased* following the removal

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[26]We run further robustness tests that shortens the pre-period to address potential outliers that may be present in event quarters before $t-9$. Even after removing these potential outliers, however, we still find a significant reduction in collections post flag-removal though at smaller magnitudes relative to the fitted pre-trend ($69*).

of the bankruptcy flag (by 0.018 per month in year 1 and 0.144 per month in year 4). [27]

Figure 5 also indicates that the flag removal did not reduce the amount of payday loans borrowed. Table IV estimates find no significant effect on the amount borrowed in payday loans in the first 3 years, and a marginally significant increase in borrowing in year 4. The lower bound of our confidence intervals allows us to rule out that there were decreases in average monthly payday borrowing larger than $1.23 in the first year (about 4% relative to the pre-flag removal mean) and we can rule out decreases of about $0.50 in year 4 (less than 2%). This analysis demonstrates that the additional traditional credit access that resulted from the bankruptcy flag removal did not reduce usage of payday borrowing as observed in our sample.

We find no effect of bankruptcy flag removals on the average amount of payday loan borrowing in each month. However, this null effect on average borrowing may mask important changes in the distribution of payday borrowing that minimally affect mean borrowing. For example, the flag removal may cause borrowers who only occasionally use payday loans to stop using them altogether, while leaving the behavior of heavy payday loan users unchanged. If the average amount borrowed is driven primarily by heavy users of payday loans, such changes may go undetected when examining average usage. In Appendix Figure 2, we explore the distribution of positive payday loan amounts pre- and post- flag removal graphically. Visually, the distribution of payday loan amounts borrowed appears to remain stable year to year, from pre- to post-flag removal. Appendix Table A1 tests the impact of flag removal on the probability that a borrower has any payday loan borrowing, the number of payday loans, and the probability that a borrower takes out payday loans of different sized amounts, based on the distribution of payday loan borrowing. We find little to no impact of the flag removal on the probability of having any payday loan nor on the distribution of loan sizes: borrowers are no more likely to take out smaller or larger loan amounts post flag-removal than before. Taken together, it appears the flag removal had little impact on payday loan borrowing across many measures of payday loan usage.

We also examine the impact of the bankruptcy flag removal on a second type of alternative borrowing: subprime, mostly online installment loans. Figure 6 shows how installment loan in-

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[27] Just like credit inquiries in our Experian data set, it is important to note that credit inquiries for alternative credit confound the effects of borrower demand and credit supply. Loans are recorded when consumers submit applications for payday loans and a lender requests a credit check to review an applicant's credit with Clarity Services. Credit applications are often submitted in response to targeted advertising. Furthermore, websites that advertise payday loans may simultaneously query multiple lenders resulting in a high volume of inquiries through a single request.

quiries and amounts changed around the time of the flag removal. Both of these measures appear to have increased relative to the pre-flag removal trend. Table IV shows installment inquiries increase at similar magnitudes to payday inquiries by 0.07 in the first year relative to the pre-flag removal trend in year 1, and increases to 0.122 by year. It is interesting to note that Figure 6 shows that these increases are relative to an *increasing* pre-trend of subprime installment inquiries, while Figure 5 shows the increases in payday inquiries are relative to a flat or slightly decreasing pre-trend. In contrast to the largely null effects on payday amounts, subprime installment amounts increase relative to their pre-flag removal trend. Figure 6 shows the amount of installment loans borrowed to increase in a sharp change of trajectory post flag removal. Table IV reports that average monthly borrowing of subprime installment products increases significantly by year 2, by $4.16, a 19% increase relative to pre-removal mean, increasing to $7.86 by year 4, a 35% increase.

C. Heterogeneity by Borrower Characteristics

Borrowers with different characteristics may be affected by flag removals differently. While we do not detect any reduction in payday loan borrowing on average, it may be the case that certain groups of borrowers changed their behavior upon the removal of a bankruptcy flag. As pointed out by Dobbie et al. (2017), using an individual's pre-flag removal credit characteristics, such as their pre-removal credit score, may cause us to over-state the impact of the flag removal due to mean reversion. So, in order to conduct our heterogeneity analyses, we follow the method used in Dobbie et al. (2017) and predict pre-flag removal characteristics using variables that are not themselves affected by the flag removal: state of residence and age. We then stratify our sample based on these predicted values, rather than the actual values, in order to avoid spurious relationships due to mean reversion.

To examine heterogeneity along these dimensions, we split the sample at the median of income (as predicted by Experian), credit score, credit limits, payday loan usage and mortgage rates and estimate our models separately across these subgroups. It may be the case that borrowers whose initial credit profile makes it more difficult for them to access traditional credit (such as those with lower incomes, credit scores, or credit limits) experience a larger proportional change in credit access when a bankruptcy flag is removed, which could affect their response. In addition, high initial rates of payday loan usage may be indicative of debt "cycles" in which payday borrowing results

in high debt service costs, inducing borrowers to take out more payday loans. It may be difficult for borrowers caught in such a cycle to reduce their payday borrowing even with a large infusion of access to traditional credit; we might therefore expect borrowers with lower rates of payday loan usage prior to the flag removal to have a greater response. Finally, we look at whether the borrower is predicted to have a mortgage, which could indicate greater familiarity with traditional credit markets.

These heterogeneity analyses are reported in Table V. Instead of reporting the estimated coefficient for each year and each subgroup, we instead take the average effect over the 4 years via a linear combination of our estimated yearly coefficients. We report the impact of the flag removal on credit score and credit limit for each subgroup, and on payday and subprime installment inquiries and amounts, rather than the full set of outcome variables. The subgroups we examine are comprised of borrowers with higher or lower predicted income (as determined using Experian's predicted income score), credit score, credit limit, payday loan usage and predicted mortgage in the period prior to the flag removal.

Across the subgroups, we observe significant increases in credit scores of between 4.7 and 9 points, and in credit card limits of between \$183 to \$431. Across all of these groups, inquiries for payday loans increase following the flag removal, by between 0.074 and 0.098 inquiries per month. For most groups, average amount borrowed in payday loans does not change significantly. We do observe a significant increase in payday borrowing for those with predicted below average credit limits in the pre-flag removal period, although it is important to note that these heterogeneity tests are not adjusted for multiple comparisons.

D.   Summary

Despite the fact that bankruptcy flag removals improve access to less expensive traditional borrowing options (such as credit cards), they do not reduce a borrower's use of payday loans. This is true across many measures capturing different margins of loan usage. The increased credit associated with a flag removal also does not reduce the probability that a borrower takes out any payday loan or the probability the borrower takes out loans of a particular size. We also examine the impact of flag removals across subgroups defined by their pre-removal characteristics. Across many subgroups, we see no evidence that the additional credit made available by the bankruptcy flag

removal reduces payday loan usage. Instead, flag removals appear to *increase* the use of subprime, predominantly online installment loans, that they perhaps were unable to qualify for prior to the flag removal. The insensitivity of payday loan use to changes in credit access is puzzling given the high cost of these short-term loans. These results are robust across a large number of alternative specifications and sample definitions which we report and describe more fully in the Appendix. In the next section, we explore various hypotheses as to why substitution away from payday loans does not occur.

V.   Why Do Borrowers Not Substitute Towards Less Expensive, Traditional Credit?

Payday loans are an expensive form of credit, with interest rates far exceeding those of credit cards or personal bank loans. However, results in the previous section indicate that, although a flag removal increases credit scores and results in a substantial increase in credit card limits and approval rates, borrowers do not reduce their use of high cost payday loans. In this section, we explore different explanations as to why this might be the case.

A.   *The Increase in Credit Access Associated with Flag Removal is Insufficient*

In Table III, we find that a flag removal is associated with an increase in credit score of about 7 points, and an increase in credit limits of about $63 immediately and $490 by year 4. It may be the case that such an increase in available credit (while a large increase relative to the amount typically borrowed in payday loans annually) is not enough to meaningfully alter borrowers' behavior, but that larger increases in credit scores or credit limits would result in an observable effect on payday loan borrowing. This would also be consistent with the predictions generated by the model in Section II.A, which imply that payday loan may not fall if credit constraints remain binding after the removal of the bankruptcy flag.

We examine this hypothesis by expanding the heterogeneity analyses conducted in Table V to additional subgroups. We estimate our model within many subgroups by dividing the sample into 10 age groups based on the deciles of the age distribution in our sample. Then, within each age group, we estimate our model separately by state. State by age groups with fewer than 500 observations

in the Experian data are dropped. This gives us over 120 subgroups defined by state and age, and reveals that individuals with different ages, living in different states, experience different changes in credit score following a flag removal. These differences may be due to their average pre-flag removal credit characteristics as well as differences across state bankruptcy and credit regulations.[28]

In Figure 7, we explore whether subgroups that experienced larger credit score, credit limit, or approval rate (i.e., trades per inquiry) improvements following the flag removal were more likely to reduce their reliance on payday loans and subprime installment loans. On the x-axis, we plot the average effect of the flag removal during the 4 post-removal years on each measure of credit access (top panel: credit score; middle panel: credit limit; bottom panel: trades per inquiry).[29] We observe that some of the age by state groups experienced much larger increases in credit scores than the sample average–increases exceeding 20 or 30 points–while other groups experienced smaller than average credit score increases as a result of the flag removal. Similarly, some groups experienced increases in credit limits exceeding $2000 or experienced increases in approval rates exceeding 30 percentage points. On the y-axis, we plot the impact of the flag removal on the amount borrowed in payday loans (left panel) or subprime installment loans (right panel). We also include a fitted line on the plot showing the relationship between these two variables. Similar to the heterogeneity analysis presented in Table V, this analysis reveals no systematic relationship between the increase in access to formal credit experienced by the subgroup and the change in the amount of payday loans borrowed. Indeed, even subgroups that experienced very large increases in credit scores, credit limits, or trades per inquiry do not appear to decreased their use of payday loans in response. This pattern suggests that even large increases in credit access still do not seem to reduce payday borrowing. Similarly, we find groups increased borrowing of subprime installment loans, with no clear pattern between the size of the credit score increase and the size of the observed impact of the flag removal on installment loan borrowing.

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[28]This exercise was inspired by the one conducted in Dobbie et al. (2019), who present a similar analysis in Appendix Table 16.

[29]We arrive at a single number by averaging the four yearly post-flag removal indicators estimated as in equation (11).

B. Changes in Exposure to Marketing

Previous research has documented that bankruptcy filers are often targeted for credit products via mail promotions, and that these promotions are more likely to include higher annual fees and lower credit limits relative to non-filers (Han et al., 2018). This suggests that the removal of a bankruptcy flag may improve credit card mail offers. However, it may also be the case that a flag removal changes the marketing for payday loans that a borrower is exposed to. If lenders increase marketing to subprime borrowers after a flag is removed, this behavior may explain why borrowers are less quick to switch away from costly payday loan products and towards less expensive traditional credit.

We explore this potential explanation by using a variable in the Clarity database that captures one type of direct to consumer marketing. Clarity's underwriting services allow lenders to "pre-screen" borrowers for payday loan or subprime installment credit offers. We use such pre-screen approvals as a measure of marketing exposure of borrowers in our sample. It is important to note that this measure captures only a small portion of the marketing experienced by borrowers; however, such direct mail efforts may be correlated with other marketing activity, making them informative about marketing exposure in general.[30]

Figure 8 shows how the number of pre-screen approvals change around the time of the bankruptcy flag removal for both payday loans and subprime installment loans. The top plot of Figure 8 shows a small increase in the number of payday loan offers that borrowers receive post flag-removal. The estimates are reported in Table VI. Although the estimates are positive and significant, they are also fairly small, indicating average monthly pre-screened offers increased by only about 0.0007 per month. Similarly pre-screened offers for installment loans is positive and significant starting in year 2, but also not of significant magnitude. The plot in Figure 8 also suggests that offers for installment loans continued to increase from pre-flag removal trends.

These results suggest that borrowers were exposed to more marketing following the flag removal, but on average these effects were small. If such small increases are correlated with increases in other types of marketing, it may be the case that this marketing for subprime products is dampening the tendency of borrowers to substitute from alternative credit to more traditional sources.

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[30]For example, payday loan companies spent about $277 million on television and radio advertising from June 2012 to May 2013 and online advertising for these products is also common (Bourke, Horowitz, Lake, and Roche, 2014).

C. Traditional Credit and Payday Loans Are Not Substitutes

Finally, low income borrowers may not shift towards less expensive credit because payday loans and credit card liquidity are not perfect substitutes. Payday loans provide two important features that are likely important to low income borrowers: 1) immediate cash and 2) zero impact to credit scores.

Both payday loans and subprime installment loans grant borrowers immediate access to cash: once the payday loan is processed, borrowers either receive cash directly (if the payday loan is borrowed at a physical storefront) or the cash is deposited into the borrower's checking account, allowing the borrower to withdraw it immediately. There are many transactions that cannot be paid with credit card such as rent, auto loan payments, tuition, child support, and taxes. Gross and Souleles (2002) document that the average U.S. household borrower already keeps a significant fraction of liquid cash in the bank despite holding a expensive revolving line of credit card debt. Telyukova (2013) finds one reason for this "credit card debt puzzle" is that borrowers need to keep a significant cash on hand to pay for household expenditures that cannot be paid for via credit card, and an additional buffer of liquidity for cash needs that cannot be anticipated.[31] Allcott, Kim, Taubinsky, and Zinman (2021b) find that for payday loan borrowers in particular, experienced borrowers are able to anticipate their payday loan needs, while inexperienced borrowers have more difficulty. Our results are consistent with this documented need for cash, and payday loans serve as a debt product to fulfill cash liquidity needs that credit cards cannot provide.

Payday loans provide an additional benefit over traditional credit in that payday loans does not impact credit scores while other debt does. In our results, we find that total collections drop consistently every year post flag-removal, by approximately \$300 in the first year and by \$817 by year 4. Appendix Table A4 shows that when we examine collections by type, we find significant reductions across medical, banking, retail, and utility collections. Medical collections make up more than 35% of total collections for our payday loan sample, and drop by approximately \$110 per year — 15% of the pre-flag removal average. Overdue debt held in collections has a negative impact on credit score, while amounts borrowed in payday loans and subprime installment loans do not. Thus, borrowers, particularly prior bankruptcy filers, may be motivated to pay off collections debt

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[31]Carter (2015) finds that in states where payday rollovers are allowed, borrowers also use pawnshops in conjunction with payday loans, emphasizing this need for cash liquidity.

first in order to preserve or continue to build back their credit profile.[32]

VI.   Conclusion

In this paper, we examine the impact of increased access to traditional credit on the use of payday and other subprime credit products. We employ a novel panel data set that links traditional credit bureau outcomes with payday and subprime outcomes across the U.S. We take advantage of the unanticipated increase in access to traditional credit products that occurs at the removal of a Chapter 7 bankruptcy flag. We find that a bankruptcy flag removal results in significantly higher credit scores and better access to credit for borrowers. However, despite this improved access to traditional credit, we do not find any evidence that borrowers reduce their use of payday loans in response. Our confidence intervals allow us to rule out all but extremely small reductions in payday loan use. Across multiple subgroups, alternative specifications, sample definitions, and measures of payday loan usage, we find no evidence that increased access to traditional credit reduces payday loan behavior. Furthermore, we find evidence that borrowers significantly increase their use of a different type of alternative credit product, subprime online installment loans. Our dataset does not include every subprime product available to borrowers, and so it is possible borrowers made adjustments on other dimensions of their credit use in response to the flag removal that we do not observe. However, our analysis is conclusive that the flag removal did not reduce the use of the payday loans or other subprime loans covered in our dataset.

Our results suggest that policies that modestly increase access to traditional credit for payday borrowers may not be successful in reducing reliance on payday loans unless coupled with other supportive policies. According to survey evidence presented in Nunez et al. (2016), most payday loan borrowers use these loans to cover regular expenses such as utility bills, groceries, medical bills, or rent, rather than to pay for one-off unexpected expenses. This suggests that policymakers looking to reduce reliance on such loans may be more successful at achieving this goal if they implement policies that make it easier for low income individuals to cover their basic needs; e.g. by improving labor market opportunities, expanding access to low-cost health insurance, or strengthening the

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[32]Similarly, we see concurrent increases in the number of auto loans. While these loans are unlikely to improve credit scores in the short run, this increase in auto debt could reflect a prioritization of improving access to transportation over reducing payday loan usage.

social safety net. For example, in contrast to our results here, recent work by Dettling and Hsu (2020) indicates that minimum wage increases *are* successful at reducing borrower reliance on payday loan products.

Finally, our results speak to the discussion more broadly about the nature of borrowing behavior among subprime, predominantly low-income populations. Our empirical framework does not allow us to directly test whether the mechanisms underlying this behavior stem from "rational" (e.g., credit limits remain too low even after the bankruptcy flag removal) or "behavioral" (e.g., self-control or information related) traits. However, it is the case that even borrowers who experience relatively large increases in credit access at the removal of the bankruptcy flag fail to substitute away from payday loan, and that marketing of subprime loan products increases around the time the flag is removed. These patterns suggest that factors other than credit limits may play an important role in borrower choices in this market.

REFERENCES

Adams, W., L. Einav, and J. Levin (2009). Liquidity constraints and imperfect information in subprime lending. *American Economic Review 99*(1), 49–84.

Agarwal, S., P. Skiba, and J. Tobacman (2009). Payday loans and credit cards: New liquidity and credit scoring puzzles? *American Economic Review 99*(2), 412–17.

Allcott, H., J. Kim, D. Taubinsky, and J. Zinman (2021a). Are high-interest loans predatory? theory and evidence from payday lending. *The Review of Economic Studies*.

Allcott, H., J. Kim, D. Taubinsky, and J. Zinman (2021b, 09). Are High-Interest Loans Predatory? Theory and Evidence from Payday Lending. *The Review of Economic Studies 89*(3), 1041–1084.

Argyle, B. S., T. D. Nadauld, and C. J. Palmer (2020). Monthly payment targeting and the demand for maturity. *The Review of Financial Studies 33*(11), 5416–5462.

Berger, E., A. Butler, and E. Mayer (2016). Credit where credit is due: Drivers of subprime credit. NBER Working Paper.

Bertrand, M. and A. Morse (2011). Information disclosure, cognitive biases, and payday borrowing. *Journal of Finance 66*(6), 18651893.

Bhutta, N., P. Skiba, and J. Tobacman (2015). Payday loan choices and consequences. *Journal of Money, Credit, and Banking 47*(2-3), 223260.

Bourke, N., A. Horowitz, W. Lake, and T. Roche (2014). Fraud and abuse online: Harmful practices in internet payday lending. Pew Charitable Trust Report.

Burke, K., J. Lanning, J. Leary, and J. Wang (2014). Cfpb data point: Payday lending. CFPB Report.

Burke, K., J. Leary, and J. Wang (2016). Information disclosure and payday lending in texas. Working Paper.

Carrell, S. and J. Zinman (2014). In harm's way? payday loan access and military personnel performance. *Review of Financial Studies 9*(27), 28052840.

Carter, S. and W. Skimmyhorn (2017). Much ado about nothing? new evidence on the effects of payday lending on military members. *Review of Economics and Statistics 99*(4), 606–621.

Carter, S. P. (2015). Payday loan and pawnshop usage: The impact of allowing payday loan rollovers. *Journal of Consumer Affairs 49*(2), 436–456.

Consumer Financial Protection Bureau (2012). Key dimensions and processes in the u.s. credit reporting system: A review of how the nation's largest credit bureaus manage consumer data. Consumer Financial Protection Bureau Technical Report.

Consumer Financial Protection Bureau (2013). Payday loans and deposit advance products: A white paper of initial data findings. Consumer Financial Protection Bureau Technical Report.

Dettling, L. and J. Hsu (2020). Minimum wages and consumer credit: Impacts on access to credit and traditional and high-cost borrowing. *Review of Financial Studies*.

Dobbie, W., P. Goldsmith-Pinkham, N. Mahoney, and J. Song (2019). Bad credit, no problem? credit and labor market consequences of bad credit reports. Journal of Finance.

Dobbie, W., B. Keys, and N. Mahoney (2017). Credit market consequences of credit flag removals. Working Paper.

Gross, D. and N. Souleles (2002). Explaining the increase in bankruptcy and delinquency: Stigma versus risk-composition. *Review of Financial Studies 15*(1), 319–347.

Gross, T., M. Notowidigdo, and J. Wang (2018). The marginal propensity to consumer over the business cycle. Working Paper.

Han, S., B. Keys, and G. Li (2018). Unsecured credit supply, credit cycles, and regulation. *Review of Financial Studies 3*(31).

Herkenhoff, K., G. Phillips, and E. Cohen-Cole (2016). The impact of consumer credit access on employment, earnings and entrepreneurship. NBER Working Paper.

Lawrence, E. and G. Elliehausen (2008). A comparative analysis of payday loan customers. *Contemporary Economic Policy 26*(2), 299–316.

Melzer, B. (2011). The real cost of credit access: Evidence from the payday lending market. *Quarterly Journal of Economics* (126), 517–555.

Miller, S. and C. Soo (forthcoming). Do neighborhoods affect credit market decisions of low-income borrowers? evidence from the moving to opportunity experiment. Review of Financial Studies.

Morse, A. (2011). Payday lenders: Heroes or villains? *Journal of Financial Economics 1*(102), 28–44.

Musto, D. (2004). What happens when information leaves a market? evidence from post-bankruptcy consumers. *Journal of Business 77*(4), 725–748.

Nunez, S., K. Schaberg, R. Hendra, L. Servon, M. Addo, and A. Mapillero-Colomina (2016). Online payday and installment loans: Who uses them and why? MDRC Report.

Pagel, M. and A. Olafsson (2016). Payday borrower's consumption: Revelation of self-control problems? Working Paper.

Telyukova, I. A. (2013). Household need for liquidity and the credit card debt puzzle. *Review of Economic Studies 80*(3), 1148–1177.

Zinman, J. (2010). Restricting consumer credit access: Household survey evidence on effects around the oregon rate cap. *Journal of Banking and Finance 3*(34), 546–556.

Figure 1. Are Payday Borrowers Credit Constrained?
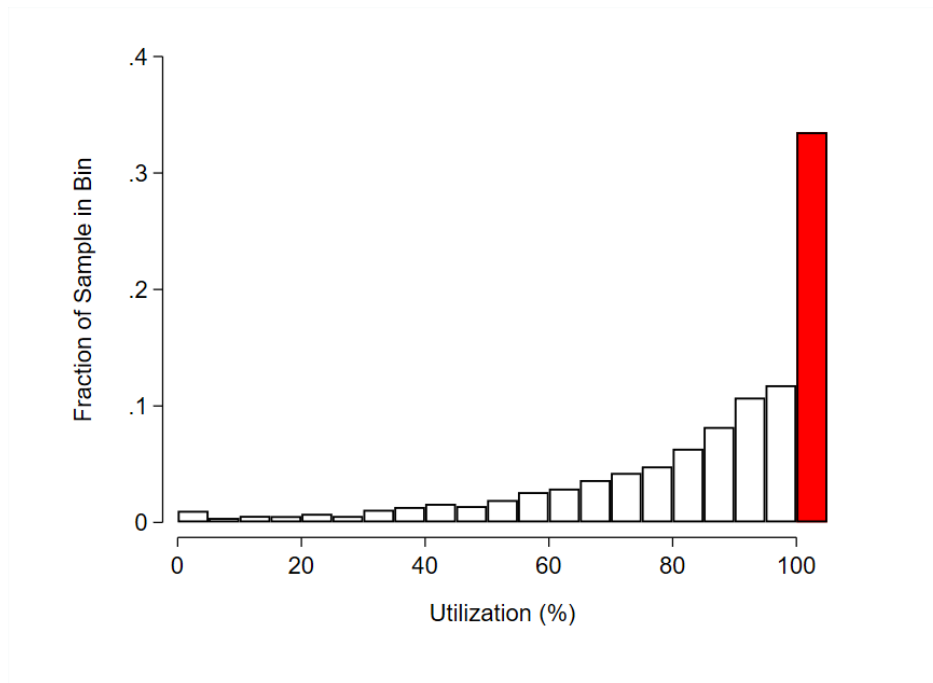
Note: Figure shows histogram of average utilization for the last 6 months of payday borrowers measured over the 6 month period during which they took out a payday loan. Red column shows borrowers who are overdrawn on their existing credit lines (that is, utilization greater than 100%), borrowers at their credit limit (utilization 100%), or borrowers with no revolving credit.

Figure 2. Direct Impact of Bankruptcy Flag Removals on Bankruptcies and Credit Access
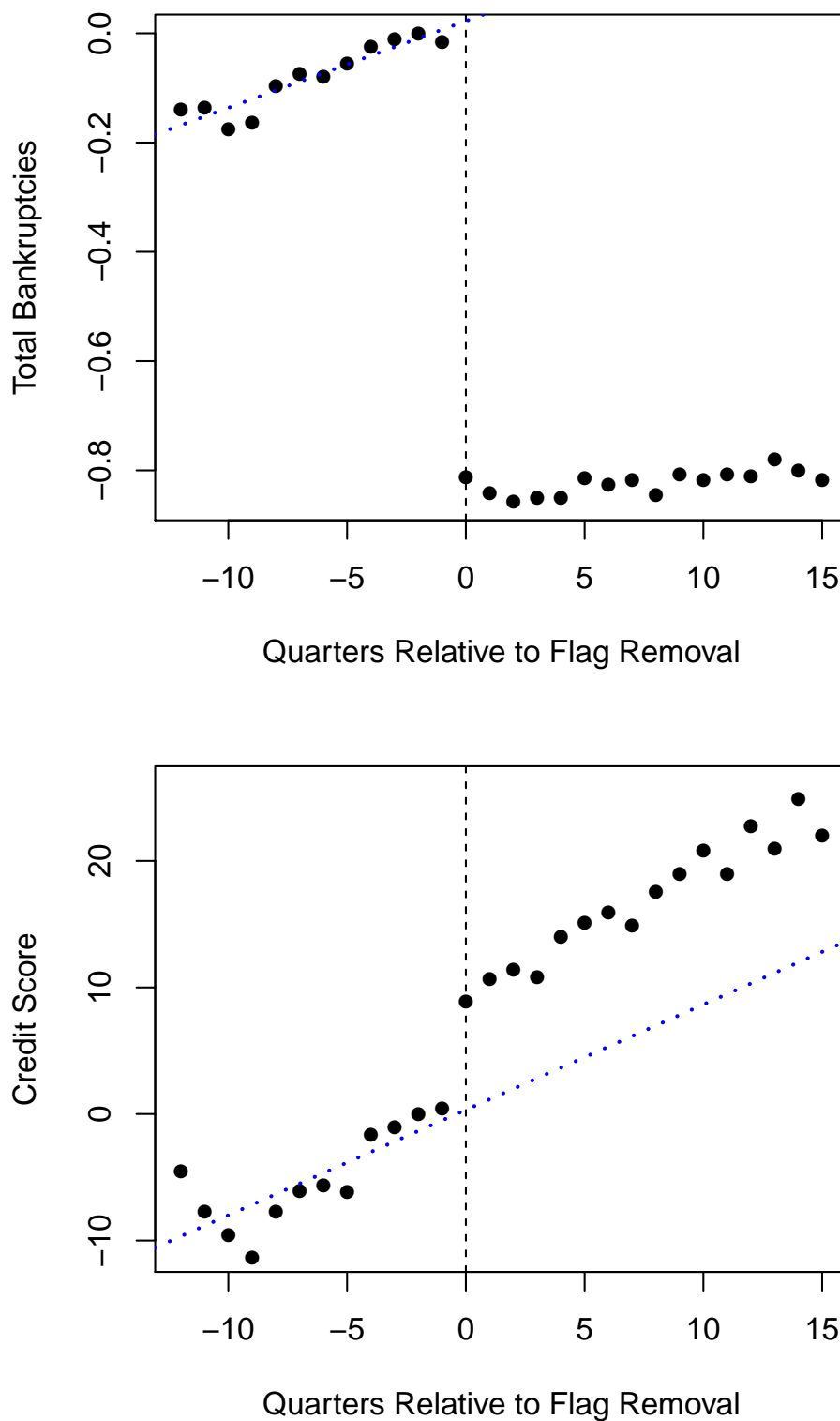
Note: Figure shows quarterly estimates from a regression that includes calendar year and year of bankruptcy fixed effects relative to the quarter in which the flag is removed (quarter 0).

Figure 3. Direct Impact of Bankruptcy Flag Removals on Credit Access and Use
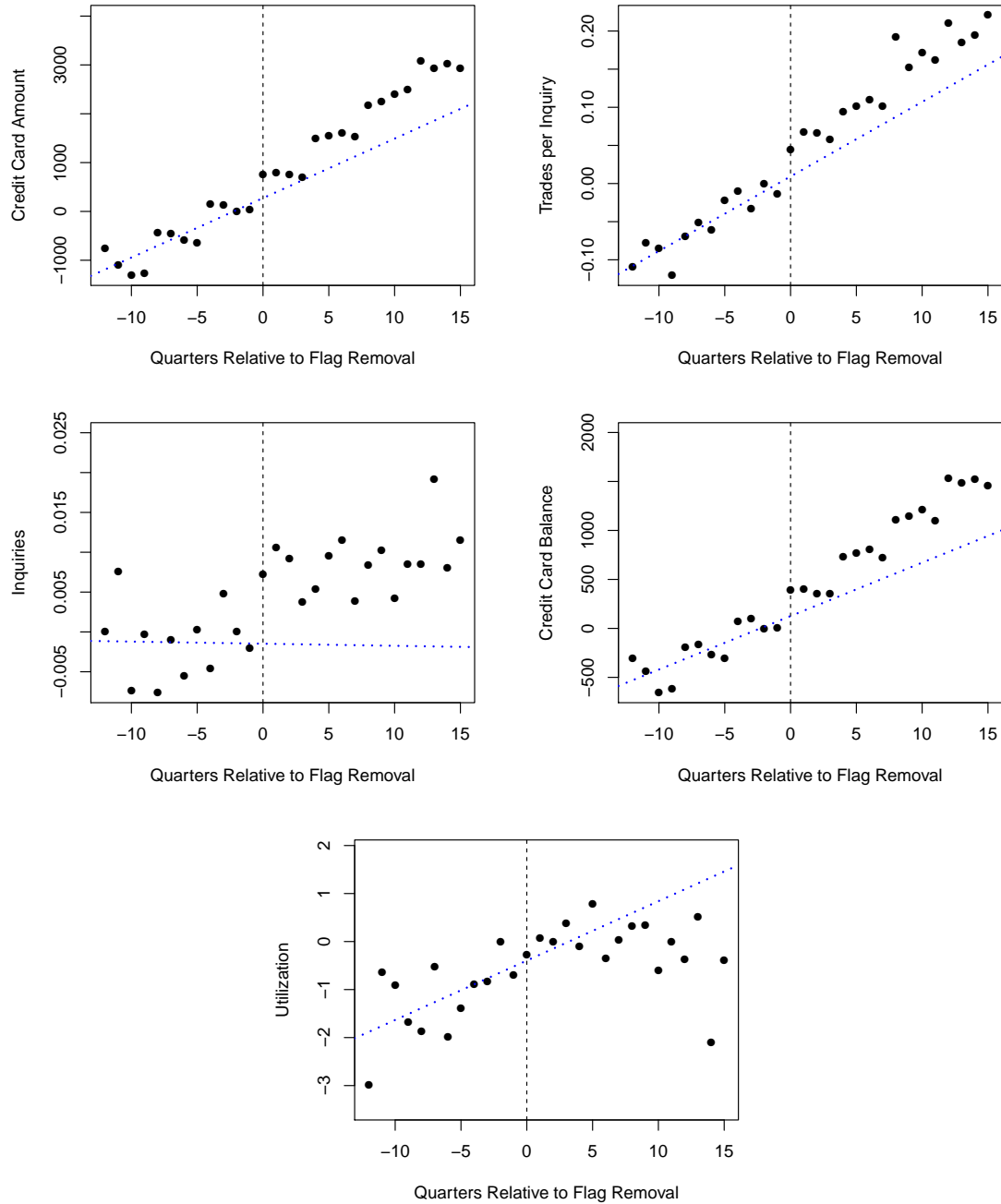
Note: Figure shows quarterly estimates from a regression that includes calendar year and year of bankruptcy fixed effects relative to the quarter in which the flag is removed (quarter 0).

Figure 4. Impact of Bankruptcy Flag Removals on Traditional Credit Usage

Note: Figure shows quarterly estimates from a regression that includes calendar year and year of bankruptcy fixed effects relative to the quarter in which the flag is removed (quarter 0).

Figure 5. Impact of Bankruptcy Flag Removals on Payday Loan Usage

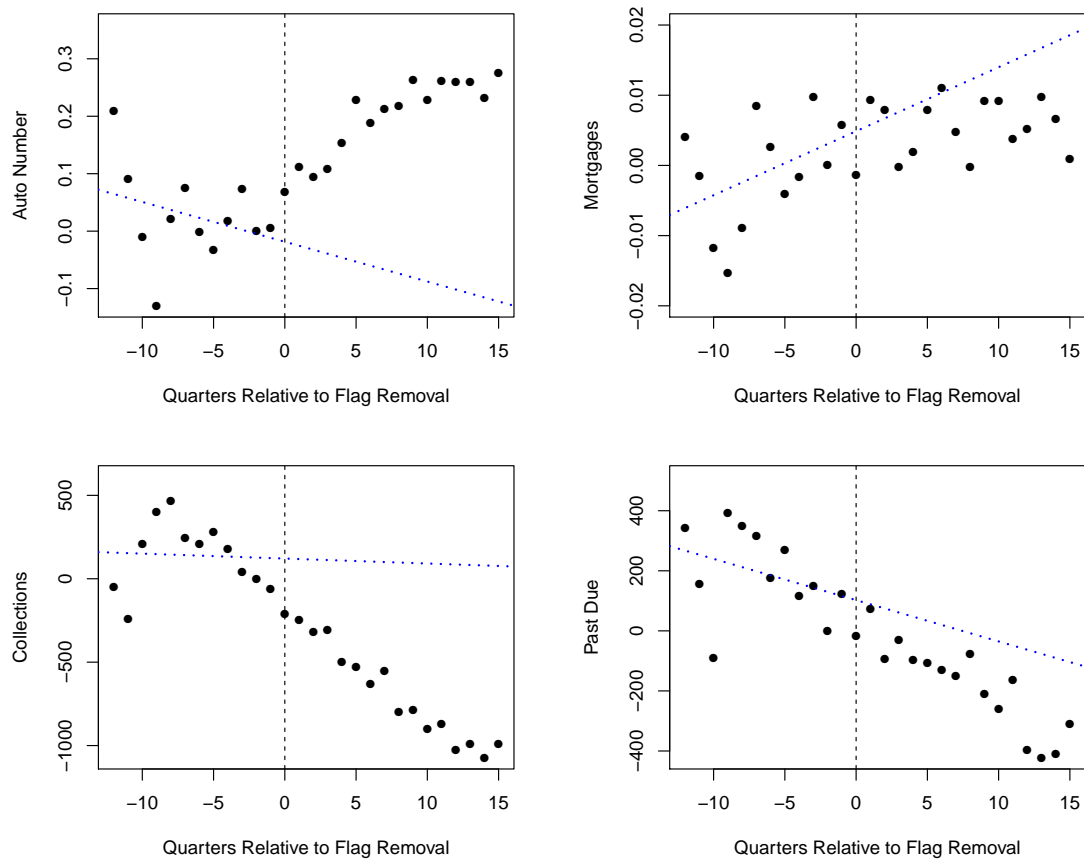Note: Figure shows quarterly estimates from a regression that includes calendar year and year of bankruptcy fixed effects relative to the quarter in which the flag is removed (quarter 0).

Figure 6. Impact of Bankruptcy Flag Removals on Installment Loan Usage

Note: Figure shows quarterly estimates from equation (1), which includes calendar year and year of bankruptcy fixed effects relative to the quarter in which the flag is removed (quarter 0).

Figure 7. Impact of Flag Removal on Subprime Borrowed Amounts vs Credit Score, Amount of Credit Available, and Approval Rates by Age x State Groups
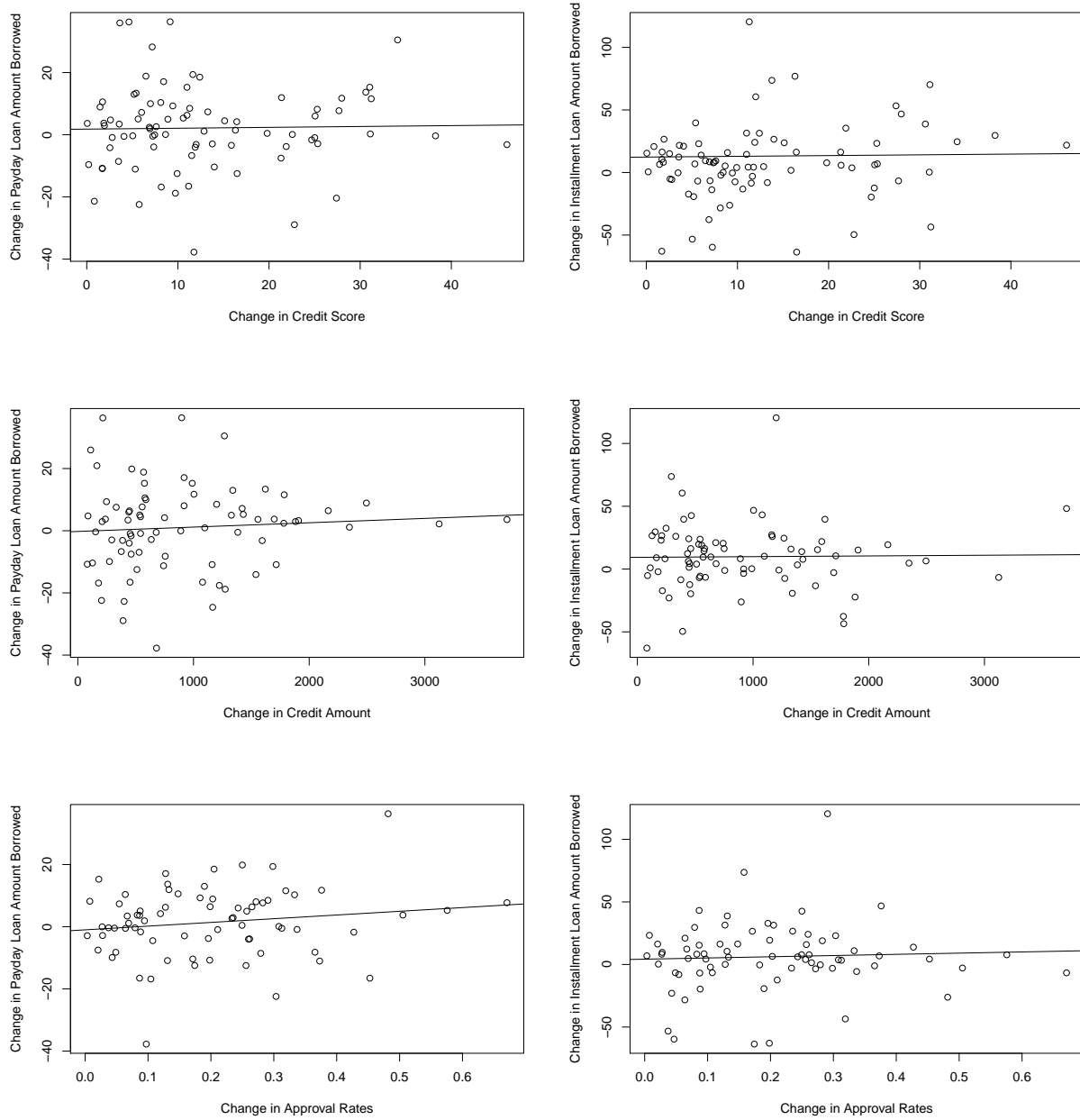
Note: Figure shows estimates of impact of a flag removal on credit score (x axis) against impact of the flag removal on payday borrowing (y axis, top panel) and subprime installment loan borrowing (y axis, bottom panel) for regressions estimated within groups defined by age and state. These regressions include calendar year and bankruptcy year fixed effects, as well as a linear pre-trend.

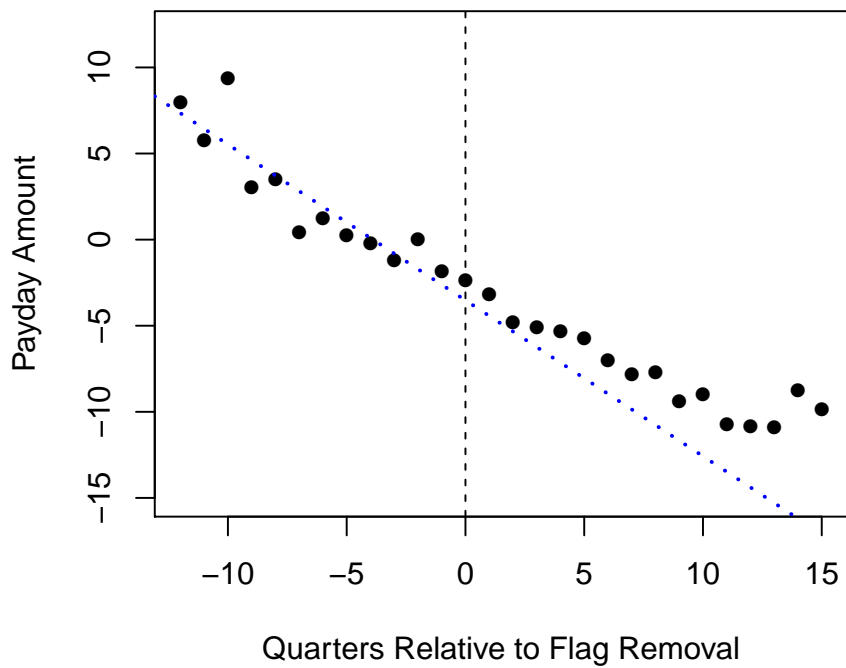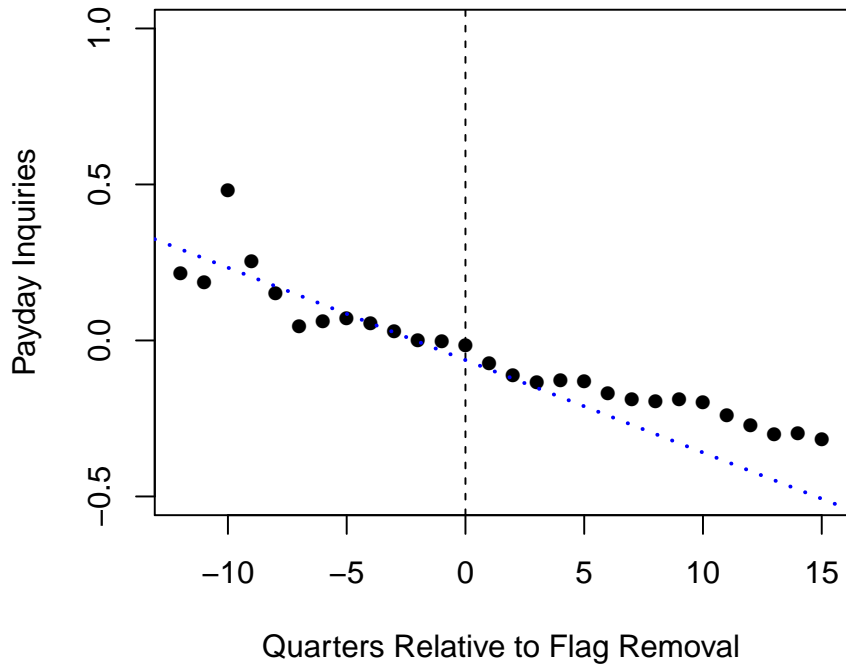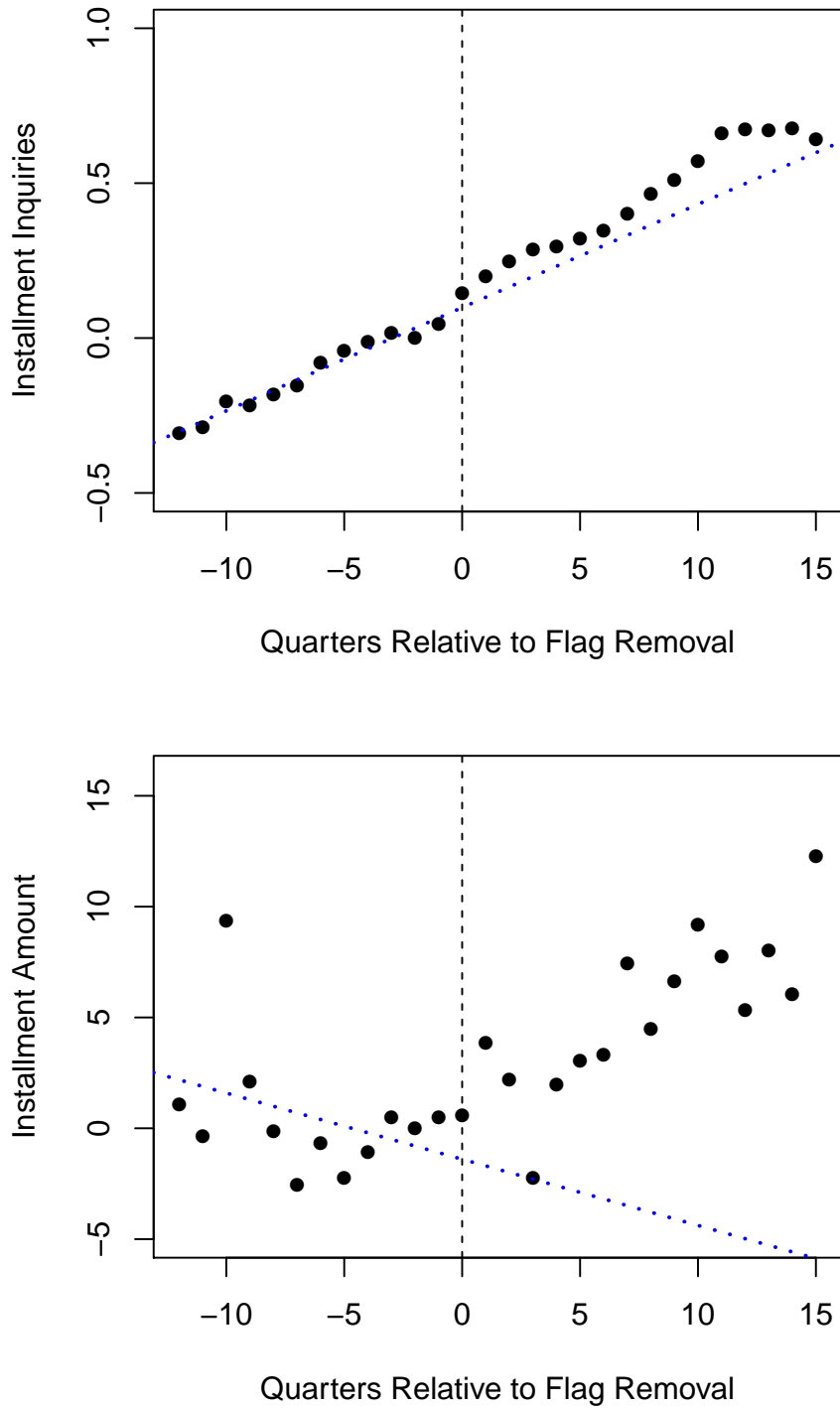**Figure 8.** Impact of Bankruptcy Flag Removals on PreScreen Offers of Subprime Loans

Note:Figure shows quarterly estimates from a regression that includes calendar year and year of bankruptcy fixed effects relative to the quarter in which the flag is removed (denoted quarter 1).
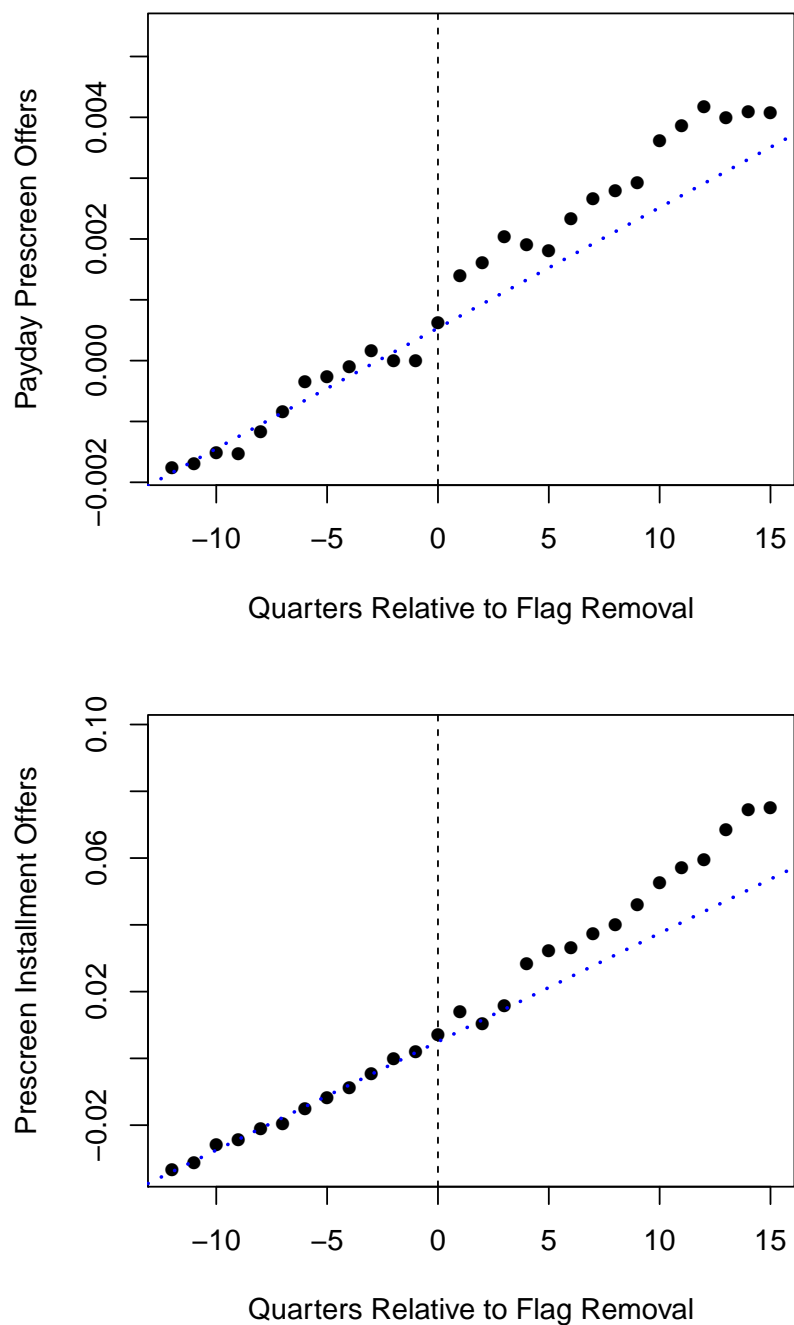
Table I Pre-Flag Removal Bankruptcy Sample Descriptive Statistics and Comparisons

	Active Alternative Credit Users with Bankruptcy Flags			Random Sample of Credit Reports with Bankruptcy Flags			Random Sample of Credit Reports		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
Traditional Credit Outcomes									
Credit Score	531.39	65.52	94,672	615.94	84.91	908,485	662.64	128.46	19,168,533
Credit Card Limit (All Cards)	1977.39	5408.47	94,672	4502.30	9121.60	908,485	18181.59	29058.92	19,168,533
Number of Inquiries Past 30 Days	0.192	0.398	94,672	0.169	0.427	908,485	0.106	0.341	19,168,533
Trades per Inquiry	0.385	0.695	47,256	3.141	6.455	323,188	3.557	7.326	4,526,254
Total Amount in Collections	3500.53	6332.75	94,672	1076.62	8326.93	908,485	1057.63	6362.53	19,168,533
Total Number of Bankruptcies on Credit Report	1.124	0.625	94,672	1.064	0.318	908,485	0.050	0.236	19,168,533
Utilization (%) on All Revolving Accounts	82.70	30.20	69,519	68.61	33.18	673,996	54.17	35.62	14,321,852
Amount 30 Days or More Past Due	1659.89	8769.83	94,672	1335.38	11780.91	908,485	896.76	12838.61	19,168,533
Number of Auto Trades	1.96	1.92	94,672	1.91	2.25	908,485	1.14	1.85	19,168,533
Number of Mortgages Open	0.102	0.325	94,672	0.139	0.400	908,485	0.297	0.639	19,168,533
Alternative Credit Outcomes (Monthly)									
Amount Borrowed in Payday Loans	28.57	160.01	628,793	N/A	N/A	N/A	N/A	N/A	N/A
Number of Payday Loan Applications	0.518	2.10	628,793	N/A	N/A	N/A	N/A	N/A	N/A
Amount Borrowed of Subprime Installment	22.31	233.97	628,793	N/A	N/A	N/A	N/A	N/A	N/A
Number Subprime Installment Applications	0.189	1.25	628,793	N/A	N/A	N/A	N/A	N/A	N/A

Note: N represents individual by year observations for traditional credit outcomes and individual by month observations for alternative credit outcomes. Trades per inquiry defined only for consumers with a positive number of inquiries. Utilization defined only for consumers with at least one revolving credit account.

Table II   Comparison Summary Payday Loan Characteristics Across Prior Studies

Payday Loan Characteristics:	Avg # Per Year	Avg Loan Size ($)	Data Sample Description
Miller and Soo, 2020	6	551	Clarity sample with Ch. 7 bankruptcy flags
CPFB 2013, 2014	6*	392	Storefront payday lenders in supervisory process
Bertrand and Morse 2009	9.2	372.5	Texas survey of 1,441 payday borrowers
Elliehausen and Lawrence 2008	8.3	n/a	National phone survey of 450 payday borrowers
Skiba and Tobacman 2011	n/a	360	141k bankruptcy filers from Texas payday lender
Fritzdixon and Skiba 2016	n/a	363	2,942 online payday borrowers from Tennessee lender

Note: This table summarizes payday loan characteristics as reported across prior studies of payday loan borrowers and our sample of payday loan borrowers. Column 2 reports the average number of payday loans per borrower among borrowers with at least one loan in the year and column 3 reports average loan size conditional on taking out a loan over the 12 months. Column 3 provides a brief description of the sample examined in the corresponding study. Note that studied samples do vary by geography, size, storefront or online loans, and time period, but provides a benchmark reference of our sample relative to prior literature. Note also that in this table we condition the sample on having at least one loan within the year, in contrast to Table I which includes the full sample. *CPFB reports median and not the mean number of loans per person per year.

Table III Effect of Bankruptcy Flag Removal on Access to Traditional Credit

	Year 1 Effect	Year 2 Effect	Year 3 Effect	Year 4 Effect
Bankruptcies (#)	-0.886***	-0.935***	-0.990***	-1.033***
	(0.00296)	(0.00466)	(0.00688)	(0.00929)
Credit Score	7.134***	7.306***	6.955***	5.910***
	(0.508)	(0.799)	(1.125)	(1.464)
Credit Limits	62.91**	242.9***	424.8***	490.4***
	(29.61)	(53.76)	(88.77)	(111.4)
Trades Per Inquiry	0.0320***	0.0350***	0.0622***	0.0543**
	(0.00903)	(0.0129)	(0.0176)	(0.0226)
Credit Inquiries	0.00967***	0.00966*	0.0102	0.0140
	(0.00358)	(0.00510)	(0.00689)	(0.00886)
Credit Card Balancee	49.71***	152.4***	258.9***	340.4***
	(18.81)	(32.51)	(47.45)	(64.17)
Utilization	0.194	-0.287	-0.888	-2.129***
	(0.268)	(0.408)	(0.557)	(0.718)
Auto Loans (#)	0.0734***	0.175***	0.226***	0.242***
	(0.00634)	(0.0108)	(0.0162)	(0.0218)
Mortgages (#)	-0.00510***	-0.00784***	-0.0139***	-0.0189***
	(0.00156)	(0.00255)	(0.00369)	(0.00488)
Collections	-299.1***	-503.1***	-728.8***	-817.5***
	(33.17)	(54.68)	(77.05)	(101.8)
Amount 30 Days Past Due	-76.08	-103.8	-92.93	-219.1
	(57.78)	(87.52)	(118.8)	(154.5)
N = 282,050				

Note: This table presents estimates of model (1). Each row represents estimates from a separate regression. The model includes year and bankruptcy removal year fixed effects and a linear "pre-trend" term. Robust standard errors are clustered at the individual level. See text for more details.

Table IV   Effect of Bankruptcy Flag Removal on Use of Alternative Credit Products

	Year 1 Effect	Year 2 Effect	Year 3 Effect	Year 4 Effect
Payday Inquiry	0.0182**	0.0603***	0.121***	0.144***
	(0.00774)	(0.0111)	(0.0152)	(0.0199)
Payday Amount	0.368	0.983	1.464	3.535*
	(0.813)	(1.236)	(1.614)	(2.057)
Installment Inquiry	0.0698***	0.0575***	0.129***	0.122***
	(0.00848)	(0.0127)	(0.0187)	(0.0274)
Installment Amount	1.220	4.155***	7.092***	7.863***
	(1.053)	(1.505)	(2.042)	(2.586)
N = 1,684,190				

Note: This table presents estimates of model (1). Each row represents estimates from a separate regression. The model includes year and bankruptcy removal year fixed effects and a linear "pre-trend" term. Robust standard errors are clustered at the individual level. See text for more details.

Table V Effect of Bankruptcy Flag Removal: Heterogeneity by Pre-Flag Removal Characteristics

	Predicted Income		Credit Score		Credit Limits		Payday Loan Usage		Mortgage	
	Below Median	Above Median	Below Median	Above Median	Below Median	Above Median	Below Median	Above Median	Below Median	Above Median
Experian Outcomes:										
Credit Score	6.521***	7.344***	7.227***	6.507***	7.261***	6.592***	7.565***	6.316***	4.743***	9.049***
	(1.128)	(1.138)	(1.146)	(1.118)	(1.120)	(1.144)	(1.171)	(1.099)	(1.136)	(1.130)
Credit Limits	365***	252.2**	182.5*	414***	430.5***	183.7*	381***	234**	278***	331***
	(79.44)	(105.3)	(99.76)	(88.79)	(82.76)	(102.9)	(88.10)	(98.06)	(95.75)	(91.98)
N:	140,608	141,442	136,174	145,876	140,398	141,652	133,642	148,408	141,525	140,525
Alternative Outcomes:										
Payday Inquiry	0.0975***	0.0740***	0.0791***	0.0917***	0.0796***	0.0924***	0.0765***	0.0957***	0.0878***	0.0850***
	(0.0178)	(0.0182)	(0.0185)	(0.0176)	(0.0184)	(0.0177)	(0.0185)	(0.0174)	(0.0188)	(0.0172)
Payday Amount	1.237	1.953	2.080	1.079	4.503**	-1.195	1.518	1.691*	2.060	1.590
	(2.272)	(1.283)	(1.693)	(1.964)	(1.933)	(1.797)	(2.400)	(0.915)	(1.472)	(2.151)
Installment Inquiry	0.102***	0.0891***	0.132***	0.0632***	0.127***	0.0636***	0.0691***	0.122***	0.129***	0.0624***
	(0.0210)	(0.0181)	(0.0198)	(0.0195)	(0.0218)	(0.0173)	(0.0202)	(0.0190)	(0.0201)	(0.0193)
Installment Amount	6.708***	3.379	3.387	6.524***	4.342**	5.792**	2.781	7.453***	6.547***	3.665
	(1.919)	(2.638)	(2.362)	(2.235)	(2.030)	(2.527)	(1.915)	(2.667)	(2.022)	(2.521)
N:	857,745	826,445	775,454	908,736	841,333	842,857	871,315	812,875	823,459	860,731

Note: This table presents estimates of model (1) for different subgroups. Each row represents estimates from a separate regression. Subgroups are defined using predicted values of characteristics listed in the top row, with predictions based on age and state of residence fixed effects. The model includes year and bankruptcy removal year fixed effects and a linear "pre-trend" term. Robust standard errors are clustered at the individual level. See text for more details.

Table VI Effect of Bankruptcy Flag Removal on "Pre-screened" Loan Offers

	Year 1 Effect	Year 2 Effect	Year 3 Effect	Year 4 Effect
Prescreen Payday Offers	0.000512***	0.000432***	0.000694***	0.000705***
	(9.79e-05)	(0.000124)	(0.000143)	(0.000180)
Prescreen Installment Offers	0.00105	0.00845***	0.0105***	0.0174***
	(0.000752)	(0.00120)	(0.00145)	(0.00188)
N = 1,684,190				

Note: This table presents estimates of model (1). Each row represents estimates from a separate regression. The model includes year and bankruptcy removal year fixed effects and a linear "pre-trend" term. Robust standard errors are clustered at the individual level. See text for more details.

Does Increasing Access to Formal Credit Reduce Payday Borrowing?

Appendix

Sarah Miller   Cindy K. Soo

Robustness checks and alternative sample definitions

In this appendix, we verify our results do not depend on particular specifications of our empirical model by exploring a variety of alternative specifications. We show the results for these specifications for our primary outcomes related to credit access (credit score and credit limit across all credit cards) and alternative borrowing (number of inquiries and amount borrowed per month for payday loans and installment loans). Similar results for other outcomes are available from the authors upon request.

Our results for these robustness checks are reported in Appendix Table A2. In the first row under each listed outcome variable, we include individual fixed effects, rather than cohort year fixed effects, to account for any change in the composition of individuals in our sample over time.

The second row under each outcome variable shows an alternative specification in which we include a "control group" in the model, similar to the approach used in Dobbie et al. (2017). For the control group, we include borrowers who had Chapter 7 bankruptcy flags removed either prior to the beginning of our sample period (before 2013) or after the end of our sample period (after 2017). These borrowers are similar to our main sample in that they also experienced a bankruptcy in the recent past, but they do not experience a flag removal over our sample period. These borrowers can be used to identify the year effects and account for any contemporaneous year shocks that occur over our sample period, analogous to a "difference in differences" design.

We implement this by estimating the following model, similar to equation (1) in the main text:

$$y_{it} = \alpha t_{pre} \times FlagRemoved_i + \gamma_y + \gamma_c + \sum_{y=1}^{4} \delta_y \mathbf{I}(r_{it} \in y) \times FlagRemoved_i + \epsilon_{it}. \tag{1}$$

Here, the indicator variable $FlagRemoved_i$ equals 1 if individual i is in our main sample, who experienced a bankruptcy flag removal between 2013 and 2017, and 0 if individual i is in the control group that had a flag removal before 2013 or after 2017. The coefficient α therefore captures the relative trend in our flag removal group, relative to the time trend estimated by γ_y. In this revised model, the estimates γ_y are identified in part by the calendar time trend experienced by the control group.

The third row under the traditional credit outcomes shows results that use Experian credit report data from 2006 through 2017. In our main results, we limit the years of Experian credit report data to match those we have available in Clarity, to improve the direct comparability of these results. In this alternative version, we show that results are similar if we instead use all available years.

For alternative credit outcomes, the third row shows results that include year by month fixed effects, rather than year fixed effects. Note that because we only observe Experian credit reports once per year, including year fixed effects is equivalent to including year by month fixed effects for these outcomes. The inclusion of the year by month fixed effects in models using the (monthly) Clarity data allows us to account for any contemporaneous time effects that occur within a calendar year.
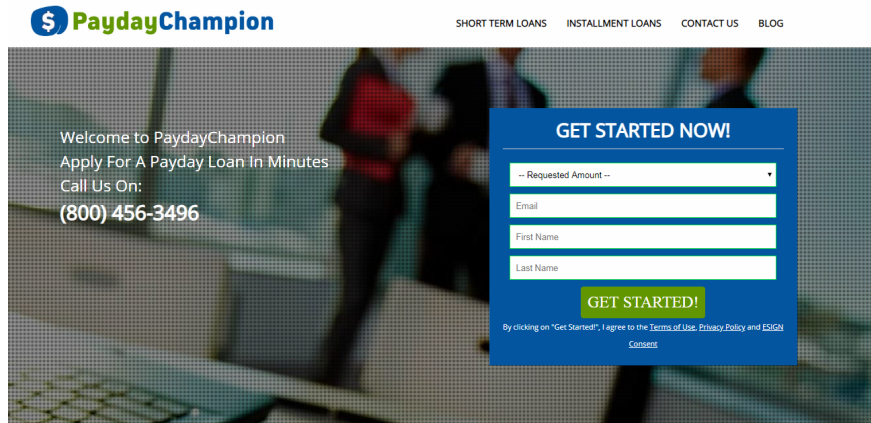
Across all specifications, we find that the flag removal significantly increased access to traditional credit but does not significantly reduce payday loan usage, and our confidence intervals are such that we can rule out even small decreases in payday loan borrowing. We also find significant increases in online installment loan inquiries and borrowing following the flag removal. This analysis supports the results in the main text, and suggests that our qualitative results are not sensitive to changes in our model specification or sample inclusion criteria.

We also examine whether our findings on payday loan usage are dependent on the coding of our outcome variable. In our main analysis, we examine whether the total amount of payday or subprime installment borrowing changed following the removal of a bankruptcy flag. However, it may be the case that, while the average amount of alternative borrowing did not change, the probability of having very large (or small) dollar values of subprime borrowing was affected. We explore this hypothesis by coding our alternative borrowing outcome variables in the following way: whether the consumer has any payday or subprime installment borrowing, whether the amount

borrowed in the month is between \$1 and \$299 (inclusive), between \$300 and \$449, between \$450 and \$633, and at or above \$634. The end points of these bins correspond to the quartiles of the payday amount distribution in months when consumers have a positive amount of payday borrowing.

These results are reported in Appendix Table A1. We do not find statistically significant changes in the probability of taking out loans of a certain size. These results suggest that the modest effects of expanded traditional credit access we find on average monthly alternative borrowing are not masking more substantial effects at other parts of the borrowing distribution.

Figure A1. Examples of Online Payday and Subprime Installment Lenders
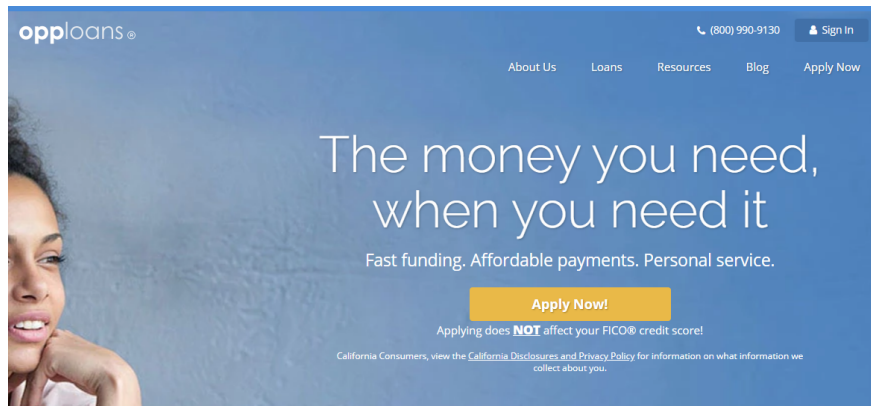
Note: Presents examples of advertising and presentation of online payday and installment loan lenders. Source: https://www.paydaychampion.com/ (upper panel), https://www.opploans.com/ (lower panel)

Figure A2. Changes in the Distribution of monthly borrowing amounts by year relative to flag removal
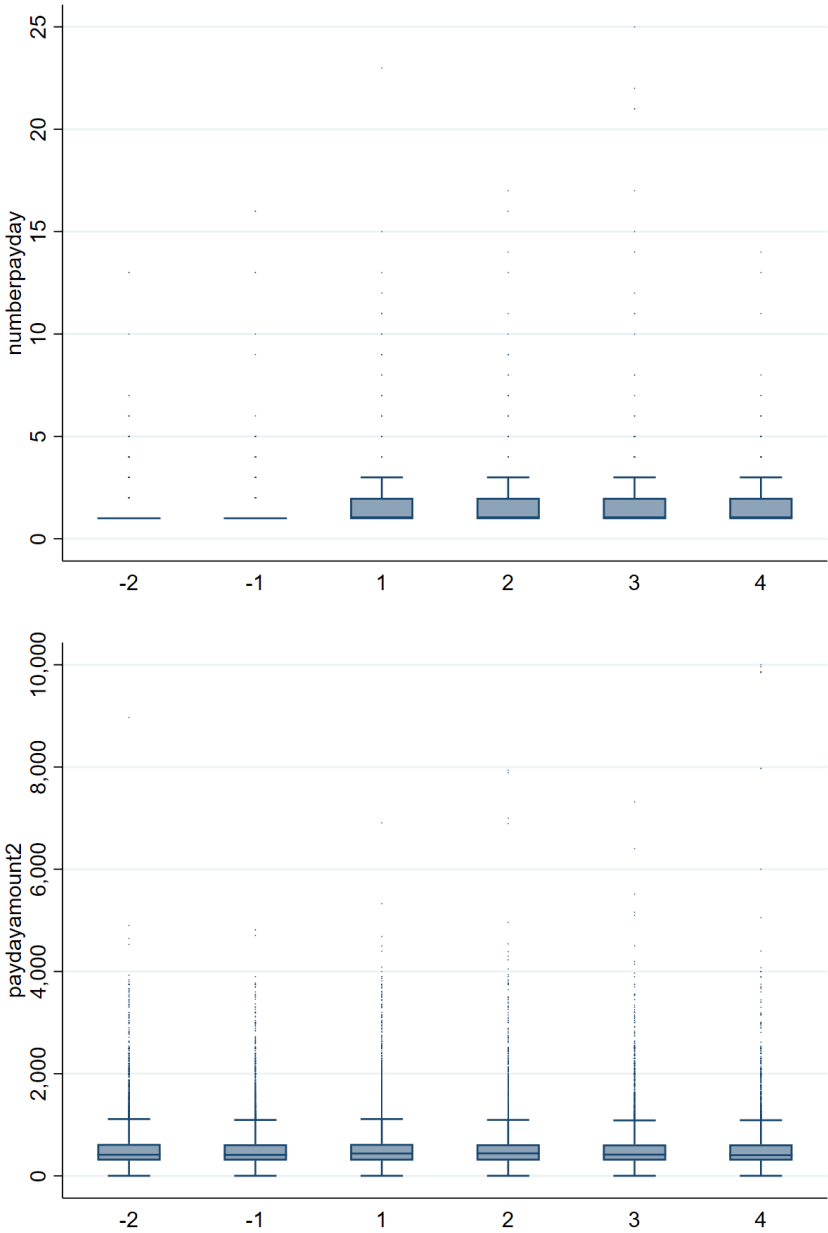
Note: Presents box and whisker plots of the monthly number of payday loans (top panel) and monthly payday borrowing amount (lower panel) by year relative to the flag removal.

Table A1 Effect of Bankruptcy Flag Removal on Taking out Any Payday Loan, Number of Payday Loans, and Probability of Taking Out Payday Loan of Different Sizes

	Year 1 Effect	Year 2 Effect	Year 3 Effect	Year 4 Effect
Any Payday	0.000412	0.00235	0.00364*	0.00530*
	(0.00107)	(0.00167)	(0.00220)	(0.00279)
Payday Loans (#)	0.00077	0.00302	0.00500	0.00698*
	(0.00161)	(0.00249)	(0.00330)	(0.00419)
Payday Amount Quartile 1	-1.42e-05	0.000549	0.000905	0.00109
	(0.000476)	(0.000711)	(0.000925)	(0.00116)
Payday Amount Quartile 2	-0.000455	-0.000280	-0.000550	4.52e-05
	(0.000493)	(0.000785)	(0.00102)	(0.00132)
Payday Amount Quartile 3	0.000476	0.00144*	0.00215**	0.00206
	(0.000506)	(0.000785)	(0.00103)	(0.00131)
Payday Amount Quartile 4	0.000405	0.000634	0.00114	0.00210
	(0.000533)	(0.000803)	(0.00105)	(0.00131)

Note: This table presents estimates of model (2) for our alternative credit outcomes. Each row represents estimates from a separate regression of each different outcome. The model includes year and bankruptcy removal year fixed effects and a linear "pre-trend" term. Robust standard errors are clustered at the individual level. See text for more details.

Table A2 Effect of a Bankruptcy Flag Removal on Traditional Credit Outcomes: Alternative Specifications and Sample Definitions

	Year 1 Effect	Year 2 Effect	Year 3 Effect	Year 4 Effect	N
Credit Score					
Individual FEs	7.094***	7.238***	7.034***	6.125***	282,050
	(0.497)	(0.773)	(1.074)	(1.390)	
Control Group	6.907***	7.144***	6.675***	5.681***	921,452
	(0.527)	(0.816)	(1.116)	(1.433)	
All Years	6.707***	6.670***	6.245***	5.098***	371,955
	(0.360)	(0.557)	(0.770)	(0.999)	
Cluster by Bankruptcy Cohort	7.109***	7.280***	7.106***	6.210***	282,050
	(0.448)	(0.725)	(0.945)	(1.218)	
Credit Limits					
Individual FEs	74.80**	263.5***	452.1***	525.0***	282,050
	(33.23)	(60.33)	(100.5)	(125.0)	
Control Group	73.48	259.4***	457.3***	542.4***	921,452
	(55.01)	(90.26)	(118.5)	(165.7)	
All Years	21.70	179.9***	336.4***	370.6***	371,955
	(21.24)	(37.81)	(64.07)	(91.82)	
Cluster by Bankruptcy Cohort	62.91*	242.9***	424.8***	490.4***	282,050
	(33.90)	(55.78)	(93.13)	(117.4)	
Payday Inquiries					
Individual FEs	0.0181**	0.0600***	0.123***	0.146***	1,684,190
	(0.00768)	(0.0110)	(0.0152)	(0.0199)	
Control Group	0.0161**	0.0627***	0.119***	0.139***	5,523,530
	(0.00775)	(0.0111)	(0.0152)	(0.0198)	
Year Month FEs	-0.00001	-0.00474	0.00566	-0.00766	1,684,190
	(0.00767)	(0.0111)	(0.0152)	(0.0198)	
Cluster by Bankruptcy Cohort	0.0182	0.0603	0.121	0.144*	1,684,190
	(0.0394)	(0.0464)	(0.0728)	(0.0856)	
Payday Amount					
Individual FEs	0.418	1.042	1.706	3.737*	1,684,190
	(0.828)	(1.255)	(1.626)	(2.079)	
Control Group	0.181	0.950	0.636	2.121	5,523,530
	(0.813)	(1.236)	(1.615)	(2.050)	
Year Month FEs	0.311	-0.293	-0.380	0.596	1,684,190
	(0.816)	(1.244)	(1.629)	(2.096)	
Cluster by Bankruptcy Cohort	0.368	0.983	1.464	3.535	1,684,190
	(1.026)	(1.695)	(2.118)	(2.503)	
Installment Inquiries					
Individual FEs	0.0691***	0.0559***	0.127***	0.127***	1,684,190
	(0.00845)	(0.0127)	(0.0190)	(0.0281)	
Control Group	0.0715***	0.0526***	0.126***	0.120***	5,523,530
	(0.00853)	(0.0127)	(0.0187)	(0.0269)	
Year Month FEs	0.0246***	0.0326**	0.0410**	0.0488*	1,684,190
	(0.00840)	(0.0127)	(0.0189)	(0.0277)	
Cluster by Bankruptcy Cohort	0.0698	0.0575*	0.129**	0.122	1,684,190
	(0.0477)	(0.0324)	(0.0620)	(0.0734)	
Installment Amount					
Individual FEs	1.203	4.256***	7.131***	8.024***	1,684,190
	(1.063)	(1.525)	(2.058)	(2.604)	
Control Group	1.113	4.130***	6.670***	7.210***	5,523,530
	(1.048)	(1.502)	(2.007)	(2.534)	
Year Month FEs	1.436	2.346	5.530***	5.027*	1,684,190
	(1.065)	(1.519)	(2.082)	(2.632)	
Cluster by Bankruptcy Cohort	1.220	4.155	7.092**	7.863**	1,684,190
	(1.818)	(2.520)	(2.895)	(3.481)	

Note: Each row represents estimates from a separate regression. Robust standard errors are clustered at the individual level. See text for more details.

Table A3 Summary of Total Collections by Type (Pre-Flag Removal)

	Mean	SD	N
Total Collections	3500.53	6332.748	94672
Medical Collections	1251.31	4535.557	94672
Banking Collections	487.05	1753.075	94672
Retail Collections	272.31	1257.694	94672
Utility Collections	462.64	928.6727	94672

Note: This table presents the breakdown of total collections by type of collections for our analysis sample of alternative credit users with bankruptcy flags on their credit report.

Table A4 Effect of a Bankruptcy Flag Removal on Collections by Type

	Year 1 Effect	Year 2 Effect	Year 3 Effect	Year 4 Effect
Total Collections	-299.1***	-503.1***	-728.8***	-817.5***
	(33.17)	(54.68)	(77.05)	(101.8)
Medical Collections	-56.86**	-112.0***	-152.3***	-122.8*
	(23.15)	(38.76)	(55.58)	(73.73)
Banking Collections	-78.41***	-147.1***	-222.1***	-292.8***
	(10.80)	(16.91)	(24.00)	(31.68)
Retail Collections	-54.10***	-88.20***	-117.7***	-136.1***
	(9.198)	(13.90)	(17.67)	(22.78)
Utility Collections	-13.53**	-7.160	0.735	9.890
	(5.650)	(9.273)	(13.17)	(17.31)

N = 282,050

Note: Each row represents estimates from a separate regression. The model includes year and bankruptcy removal year fixed effects and a linear "pre-trend" term. Robust standard errors are clustered at the individual level. See text for more details.