Second Chance: Life without Student Debt*

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Abstract

Rising student debt is considered one of the creeping threats of our time. This paper examines the effect of student debt relief on individual credit and labor market outcomes. We exploit the plausibly-random debt discharge due to the inability of National Collegiate, the largest owner of private student loan debt, to prove chain of title for thousands of loans across the US. Using hand-collected lawsuits filings matched with individual credit bureau information, we find that borrowers experiencing the debt relief shock reduce their indebtedness by 26%, by both reducing their demand for credit and limiting the use of existing credit accounts, and are 11% less likely to default on other accounts. After the discharge, the borrowers' geographical mobility increases, as well as, their probability to change jobs and ultimately their income increases by about $3000 over a three year period. Albeit we cannot quantify its costs, these findings speak to the benefits of loan forgiveness to reduce the consequences of debt overhang problems.

Keywords: Student Debt Forgiveness, Private Student Loans, Legal Settlement, Mobility, Debt Collection, National Collegiate

JEL Classification: D14, H52, H81, J24, I23

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1. Introduction

Student debt has experienced a staggered growth in the last decade, reaching $1.5 trillion in the first quarter of 2018 (NYFED, 2018). Since the Great Recession, student debt levels surpassed auto loans, credit card debt and home-equity lines of credit and currently only trail mortgage liabilities as the second largest consumer debt in the United States. Since 11 percent of borrowers are 90 days or more delinquent on their student debts, rising student debt is considered one of the creeping threats of our time. This situation has ignited a heated debate about potentially bringing relief to borrowers crippled by student debt, and policymakers have considered ways to keep the student loan problem from swelling out of control. The newly appointed Chairman of the Federal Reserve even stated that "As this goes on and as student loans continue to grow and become larger and larger, then it absolutely could hold back growth."

Federal student loans are directly funded by the government and offer numerous consumer protections such as income-based repayment options that help borrowers in need. However, many people with private student loans, like those who took on subprime mortgages, end up shouldering debt that they never earn enough to repay. These trends might have aggregate effects because about 44 million graduates hold student debt with amounts averaging more than $30,000, and such burden might constrain borrowers' consumption and savings decisions. What exacerbates the situation is also a general lack of consensus on the policy objectives. For instance, they might be designed to target the liquidity constraints that have pushed the borrowers into distress, e.g. by relating the monthly repayments to borrowers' income. Alternatively, policymakers could implement interventions targeting the debt overhang problems associated with facing a significant debt burden, e.g. forgiving student loan principals altogether.[1] The empirical challenge in examining borrowers' behavior and potential reactions to changes in policies is to find plausibly exogenous variation in the borrowers' exposure to student debt and collect detailed information about the borrowers' decisions over time.

This paper overcomes these challenges in two ways. First, we have credit bureau data on borrowers' balance sheets, which provides information, such as monthly payments and loan amounts, on all type of accounts, but also provides employment and income information for a substantial sample of

[1] See, for instance, the policy proposals recently discussed (https://www.forbes.com/sites/robertfarrington/2019/04/24/the-2020-presidential-candidates-proposals-for-student-loan-debt/1c74e147520e).

borrowers. Second, we exploit a plausibly exogenous debt relief shock experienced by thousands of borrowers due to the inability of the creditor to prove chain of title. Specifically, the largest holder of private student loan debt, National Collegiate with 800,000 private student loans totaling $12 billion, and its collector agency, Transworld Systems, lost a series of collection lawsuits against the borrowers they were collecting from. National Collegiate bought the student loans from a series of banks and other financial institutions, but judges throughout the country have tossed out collection lawsuits by National Collegiate, ruling that it failed to establish the chain of title, because it was not able to prove it owned the debt on which it was trying to collect. This provides an ideal setting to explore the effects of relieving borrowers from debt overhang as the lack of documentation by National Collegiate is random and exogenous to borrowers' choices.

We hand-collected a unique dataset with information about these lawsuits, which provided us with details on the borrowers' identities, when these lawsuits were filed and adjudicated and in which court. This allowed us to then match this information to credit bureau data at household level in order to obtain a rich set of outcome variables for these borrowers. In order to isolate the effect of the student relief on these borrowers, we use a control group of borrowers living in the same ZIP Code, with the same age, a similar student loan amount to pay off, and most importantly, we restrict attention to borrowers that were also in default. Intuitively, we do not want to compare borrowers whose student debt was discharged to borrowers that were current on their debts. Instead, we only exploit the heterogeneity in the ownership of the student debt and the collection agency. We control for individual fixed effects as well as county by month fixed effects in this difference-in-differences setting to control for any time-varying local economic shocks.[2] Furthermore, we test and confirm the hypothesis that the treatment group and the control group are indistinguishable in the pre-period. Finally, we also provide consistent evidence when we restrict attention to the treatment group by only exploiting the timing of the discharge.

This setting provides us a unique opportunity to study the burden that defaulting on student loans represents for millions of individuals. Before evaluating our main outcomes, we first verify the effect of student debt relief on student loan balance and credit score for treated borrowers in our

[2] A similar approach has been used by Mayer et al (2014) to study whether homeowners respond strategically to changes of mortgage modification programs induced by settlement of U.S. state government lawsuits against Countrywide Financial Corporation.

sample. We find that, on average, debt relief leads to a decline in student loan balance by $6,855. This decline is substantial for borrowers in our sample whose average monthly income is $2,376. However, there is ample variation in this decline in student loan balance as reflected by the standard deviation of $11,602. Even when we estimate our baseline specification, which allows us to compare the effects to our control group, we find that on average borrowers who experience debt relief have 0.65 fewer student loan accounts, student loan balance declines by $5,320 and credit scores increase relative to other borrowers that do not experience the discharge.

We proceed by analyzing three main sets of outcome variables. First, we explore whether borrowers' leverage changes in the aftermath of the debt relief. We find that borrowers reduce their total liabilities, excluding the student loans object of the lawsuit, by about $4,000. The results are consistent across accounts as they delever across all types of loans, from credit cards to auto loans to home loans. We are also able to provide evidence that such adjustment happens along both the extensive and the intensive margins. In other words, the number of accounts decreases, and the balance on the existing account decreases as well, and this is mainly driven by higher repayments. Furthermore, we also show that borrowers reduce the number of inquiries, consistent with a lower demand for credit. Note that these borrowers were in default, so the effects we provide are not due to the cash-flow effect of having the monthly payment associated with the student debt becoming disposable income, i.e. they were not paying even before the legal settlement.

The second set of results pertain to borrowers delinquency. We test whether, having experienced relief from the student debt, these borrowers experience lower delinquency rates on other accounts. We find that the treated borrowers are significantly less likely to default on any type of account, an average decrease of about 11%, and this decline occurs across different accounts, namely credit cards, auto loans and mortgages. Conditional on being delinquent, their past-due balance also decreases significantly by about $400, which is a decrease of about 18%. We also show that the borrowers experiencing the discharge are less likely to file for bankruptcy, be subject to foreclosures or default on their medical bills. These findings speak to the potential spillover effects across liabilities and to a potential indirect benefit of intervening in this market by helping borrowers unable to afford their student loan debts.

Another set of results involves mobility and income. We are able to trace the residence of

these borrowers before and after the debt relief shock. Consistent with a debt overhang problem affecting these borrowers, we find that the treated individuals are significantly more likely to move to another state when their student loans get discharged. This suggests that indeed these borrowers are more able to pursue opportunities elsewhere when relieved from the burden of their financial obligations. We further explore this dimension by analyzing whether the borrowers income increases in the aftermath of the debt discharge. For a more restricted sample of borrowers, we also observe the income from a proprietary database used for income and employment verification services. Consistent with the hypothesis that once their debt is discharged the borrowers are able to pursue better opportunities, we find that these borrowers' income increases by more than $3,000, which is roughly equivalent to 1.25 months' salary. This increase in income is likely due to the borrowers' ability to accept better jobs. We indeed find that treated borrowers are significantly more likely to change jobs with respect to the control group after the debt relief shock and to accept higher-paying jobs. These findings speak to the importance of debt overhang for these borrowers, who seem to be constrained by the presence of the student loans on their record. This occurs because many employers check credit reports for hiring decisions, so the discharge is likely to make these borrowers better job candidates. Also, since student loans are not discharged in bankruptcy, these borrowers might not pursue high risk-high pay jobs, because they would need to pay these loans and prefer more stable income. Finally, these borrowers might expect that for any extra dollar of income earned, a significant fraction will be used to pay these loans when they will be collected upon, which lowers their incentives to earn more in the first place.

In the last set of results, we also explore whether eliminating the borrowers' debt also increases their spending ability. Although we do not have a comprehensive measure of consumption, we can infer car purchases from the credit bureau information. We show that borrowers are significantly more likely to increase their consumption after debt discharge. As with the findings on decreased defaults, this evidence further shows that policy interventions in the student loan market should not be considered a zero-sum game between lenders and borrowers, as there might be wider implications for the economy.

We test the robustness of our findings in a number of ways. First, we exploit the timing of the discharges, by only performing our analysis on the sample of treated individuals. This allows us

to compare individuals who get discharged at time t with those that get discharged at time $t+n$ and show that the results hold even in this restricted specification. It allows us to show that the choice of the control group, and potential issues about why loans are sold to National Collegiate, are not confounding our findings. Second, to show whether the results are mainly driven by the better access to credit post-discharge, due to the increase in credit score, we provide a specification where we control for bins of credit score interacted with month dummies, and show that the results are qualitatively unaffected, suggesting it might not be a key channel. Furthermore, since we found that borrowers tend to delever in the aftermath of the discharge, credit access is less likely to be driving the results. To further confirm that the results derive from the discharge, we exploit the heterogeneity in the amount that get discharged and show that the results are the strongest among the borrowers whose discharge amount is above the median. Finally, to test whether liquidity constraints operate through the control group of borrowers, whose wages may be garnished as part of the collection process, we examine the heterogeneity in effects across borrowers that reside in states with different levels of restrictions on wage garnishment. We do not find significant differences across these groups.

Overall, our results shed novel light on the potentially adverse effects of the increase in student debt and of the corresponding defaults on individuals outcomes. Albeit we cannot use our experiment to infer the costs of intervening in the student loan market, our findings suggest that the costs of the rising student debt burden on the new generations can indeed have important effects: student debt limits the borrowers' access to better opportunities and also has significant spillover effects to other debt classes.

Our evidence complements a recent strand of the literature showing that alleviating short-run liquidity constraints have a beneficial effects on individuals' behavior, by highlighting the role of long-run constraints. For instance, Ganong and Noel (2018) show that, in the context of the Home Affordable Modification Program (HAMP), principal write-downs had no impact on underwater borrowers, while lower monthly payments benefited borrowers. This is consistent with the evidence on the effects of lower monthly mortgage payments shown by Di Maggio et al. (2017) and Fuster and Willen (2017) and the literature on marginal propensity to consume out of transitory income shocks (e.g. Gross and Souleles, 2002, Johnson, Parker and Souleles, 2006, and Agarwal, Liu and Souleles, 2007). Our findings show that debt overhang might be a real issue facing millions of student loan

borrowers, which significantly shapes their behavior. The difference might be due to the fact that student loan cannot be discharged in bankruptcy, while the other studies have focused on other types of debts.[3] Similar conclusions about the importance of debt overhang have recently been drawn in the context of credit card modification programs by Dobbie and Song (2019). Also related is a recent paper by Cheng, Severino and Townsand (2017), which explores how consumers fare outside of the court system when they negotiate directly with debt collectors. Our paper provides insight into what are the effects on borrowers' behavior and financial health once they are relieved from the collection process.

Given its staggering growth and potential consequences on generation of young individuals, the student loan market has attracted increasing attention from academics.[4] For instance, the level of student debt might have effects on human capital acquisition, in fact, Fos, Liberman and Yannelis (2018) analyze federal student loan borrowers in the US, and document a negative relationship between the level of undergraduate student debt and graduate school enrollment. Similarly, Scott-Clayton and Zafar (2016) investigate the effect of merit-based aid on future earnings and debt.

Also related are some recent studies on mobility. Bleemer, Brown, Lee and van der Klaauw (2017) provide evidence that in regions where many students are exposed to college costs, increased tuition is associated with more co-residence with parents and less living with roommates. While Goodman, Isen and Yannelis (2018) show that an increase in federal government lending has a significant effect on household formation early in the lifecycle, leads to a persistent increase in homeownership, with larger effects among those most financially constrained. Our paper builds on this literature by exploiting quasi-exogenous variation to causally assess the effects on financial and labor outcomes of debt relief.

There are also few papers trying to understand the reasons behind the recent increase in the stock of student loans. It has been related to an increase in tuition across country and to the financial crisis. Specifically, Lucca, Nadauld, Shen (2018) establish a causal link between student loan availability and college tuition which has been the subject of policy discussion and debate for at

[3]Our paper is also related to the recent evidence showing the effects of bankruptcy protection (e.g. Dobbie, and Goldsmith-Pinkham, 2014, Dobbie and Song, 2015, and Dobbie, Goldsmith-Pinkham, and Yang 2017), mortgage debt overhang (e.g. Melzer 2017, and Bernstein 2017) and credit constraints (Herkenhoff, Phillips and Cohen-Cole 2018, 2019).

[4]See Avery and Turner (2012) for an early discussion of which students are more likely to borrow too much and those more likely to underinvest in college education.

least three decades (Bennett, 1987, for example), whereas Amromin, Eberly and Mondragon (2018) analyze the relationship between student loans and the housing market and estimate that, for every lost dollar of home equity credit that would have been used to nance college enrollment, households increase student loan debt by forty to sixty cents.

Overall, we believe our paper can offer a unique opportunity to investigate how the student loan burden affects the individuals' consumption and borrowing decisions as well as their income and employment prospects. In doing so, this paper also quantifies how valuable it is for these individuals to lift the constraints attached to an excessive debt burden.

The rest of the paper is organized as follows. Section 2 describes the data employed, the construction of the sample and the empirical strategy. Section 3 presents the main results of the paper. In an effort to better understand the borrowers mostly affected by debt relief, Section 4 explores whether our effects are heterogeneous depending on borrowers' characteristics and presents the different mechanisms behind our results. Section 5 discusses the policy implications of our paper, Section 6 describes a series of robustness checks, while Section 7 concludes.

2. Empirical Framework

This section first describes the source of our exogenous variation, then discusses the data sources and empirical methodology to measure the impact of debt discharge on borrowers' outcomes.

2.1. Court verdicts

National Collegiate is the largest private holder of student debt in the US with 800,000 private student loans, totaling $12 billion.[5] According to the Consumer Financial Protection Bureau investigation, more than $5 billion of the debt held by National Collegiate was in default as of 2018. National Collegiate with its collection agency, Transworld System, have brought tens of thousands of lawsuits in the past five years across the country to aggressively pursue borrowers who fell behind on their bills. However, judges throughout the country have tossed out lawsuits by National Collegiate, ruling

[5]National Collegiate is an umbrella name for 15 trusts.

that it failed to establish the chain of title, because it was not able to prove it owned the debt on which it was trying to collect.

The issue arises from the fact that National Collegiate is not a lender, but rather it purchased loans made to college students a decade ago by dozens of different banks, which were bundled together by a financing company and sold to investors through securitization.[6] But as the debt passed through many hands before landing in National Collegiate's trusts, critical paperwork documenting the loans' ownership disappeared for a subset of loans. In other words, National Collegiate's legal problems have hinged on its inability to prove it owns the student loans.

While valid affidavits must be signed by a witness with personal knowledge of the consumers' account records, the CFPB found that such affidavits didn't exist in many of the lawsuits. In fact, Transworld employees completed and notarized sworn legal documents for lawsuits brought on behalf of the trusts, but these were ruled insufficient to prove ownership of the debt because the collector did not have personal knowledge of these records.[7] In 2017, the CFPB fined the National Collegiate Student Loan Trusts, and its debt collector nearly $22 million, charging them for aggressively suing students for debts that they allegedly couldn't prove were legitimate. These lawsuits rulings provide an ideal setting to identify the effects of debt relief on borrowers' outcomes, as they are arguably orthogonal with respect to the borrowers' characteristics.

2.2. Data

Our analysis relies on two unique data sources. First, to take advantage of the settlements as source of variation, we hand-collected information about all collection lawsuits initiated by National Collegiate or its collection agency, Transworld Systems, using a new platform provided by LexisNexis. Lawsuits against borrowers who have fallen behind on their consumer loans are typically filed in state or local courts, where records are often hard to search. This means that there is no national tally of just how often National Collegiate's trusts have gone to court. This required us to go through all filings related to the trusts and then select the ones related to the collection of student loan debt county

[6]These private loans were not guaranteed by the federal government.

[7]In one frequently cited ruling, Lovett v. National Collegiate Student Loan Trust 2004-1, a Florida appeals court held that the creditor, a securitized investment trust, had not submitted sufficient evidence to prove that it owned the note on a loan originated by Bank One in Chicago.

by county. This allowed us to gather information about the identity of the defendants, the court in which the case was filed, the date of filing and adjudication. The data covers all civil courts in the US starting in 2010 and ending in 2017.

The second unique data is provided by Equifax Inc., one of the main credit bureaus, which allows us to construct the key outcome variables. The credit bureau provides information on households balance sheets, specifically, monthly payment history of all the borrowers' loans, including auto loans, mortgages, home equity lines of credit, student loans and credit cards (revolving). The data has granular information about the main features of these loans, such as date opened, account type, credit limits, monthly scheduled payment, balance, and performance history. It contains more than 200 million consumer credit files and over a billion credit trades, i.e. information about single loans, and is updated monthly. Limited versions of this data have been employed in other papers studying households' financial decisions. However, our proprietary version is unique in a few respects.

First and foremost, to carry out our analysis, we need to be able to match the borrowers' information from the lawsuits to the credit bureau's information. The bureau matched the names and location of the borrowers with credit records by using both the names of the borrowers as well as the location and the existence of a defaulted student loan account on file. We verified the match by also making sure that the identified borrowers had student debt discharged after the decision date of the lawsuit. This resulted in about ten thousand borrowers for which we could match the legal information to the credit files.

Second, our data are not confined to households balance sheet information but include several other information about the borrowers. For a significant sample of borrowers including millions of individuals from more than 5,000 employers in the U.S., we observe their masked employer identity, as well as the industry they work in and their main occupation, through Equifax's proprietary employment data used in employment and income verification. For the same sample, we observe information on each employee's wages, and whether the employee remains employed at the firm at a given point in time.[8] We also observe demographic information, such as the gender, whether the borrower is married and a college graduate, which is collected by creditors. Overall, we believe our data provide us with a unique opportunity to study the value of student debt relief on borrowers'

[8]See Kalda (2019) for a more detailed discussion on the representativeness of the employment and income data.

credit outcomes and mobility.

2.3. Empirical methodology

Our empirical strategy consists of exploiting the individual court decisions as source of exogenous debt relief uncorrelated with borrowers' characteristics. Then, the individuals involved in the failed collection lawsuits constitute our treatment group and we can compare their outcomes before and after the debt discharge.[9] Since this is likely to be a population of severely-constrained borrowers, we do not want to compare their behavior with borrowers that were current on their debts. Instead, we want to exploit the cross sectional variation provided by the fact that only the National Collegiate trust was the subject of these failed collection attempts.

Then, other borrowers that were similarly situated in default constitute a natural control group. Specifically, we build our control group by gathering information about all other individuals who reside in the same ZIP Code, are of the same age (less than one year apart), carry similar student loan amounts, and crucially, who defaulted on their student loans as well. In other words, our control group is other borrowers exposed to the same local economic conditions, with the similar demographic characteristics, that also defaulted on their student debts, but whose loan was not held by National Collegiate, which resulted in their debt not being charged off. Having defined our treatment and control group, our main specification takes the following form:

$$Outcome_{i,j,t} = \alpha + \beta \times (Treated_i \times Post_t) + \mu_i + \gamma_{j \times \tau} + \varepsilon_{i,j,t} \tag{1}$$

where the outcome variables range from defaults to leverage, to mobility and income; $Treated_i$ is a dummy that identifies the treated individuals who received the debt discharge; $Post_t$ is an indicator variable identifying the 36 months after the discharge and zero for the 36 months before, while μ_i and $\gamma_{j \times \tau}$ are county by event-month fixed effects[10]. The *Post* dummy is purposely capturing several months after the discharge because for some of our outcomes we would expect a lagged reaction. We cluster the standard errors at the ZIP Code level[11]. To study how long it takes for the borrowers

[9]Note that National Collegiate lost documents for only a fraction of loans, so treatment group comprises a sub-sample (and not all) of borrowers whose loans were owned by the company.
[10]We show that our results are robust to including calendar-month fixed effects.
[11]Table OA 2 shows that our results are robust to double clustering by ZIP code and calendar-month level.

to react to the discharge, and to explicitly show that the treatment and the control group are indistinguishable before the discharge, we also estimate the following dynamic specification:

$$Outcome_{i,j,t} = \alpha + \sum_{\tau=-25}^{25} \beta_\tau \times (Treated_i \times Post_\tau) + \mu_i + \gamma_{i\times\tau} + \varepsilon_{i,j,t} \quad (2)$$

so that we can plot the estimated coefficients β_τ with the corresponding confidence intervals. Since our sample consists of 24 months on either side of treatment, the dummy variable at both ends captures all months before or after that particular month, i.e. $\tau = 25$ ($\tau = -25$) captures all months after (before) 24 months from treatment. In the appendix we report separately the dynamics of the treatment and control group to further show that the results are driven by changes in the treatment group.

2.4. Summary statistics

We begin our analysis by describing our sample in Table 1. Panel A reports the summary statistics for the main variables used in the analysis. There are 9,878 individuals in the treatment group and 93,974 in the control group. Our borrower × month panel data contains about 6 million observations when we restrict the credit report data to only three years before and after the treatment date. We find that on average these borrowers have about 7 credit accounts, which include any type of loan, and a total debt balance of about $25,000, of which $16,000 are not related to the student loans. The average credit card utilization is 34%, and they have on average about one account in delinquency status in addition to the student loan with an average $2,200 past-due amount. Finally, the average monthly salary is $2,300.

In order to discuss how the borrowers in our sample compare to the average borrower, Panel B reports key statistics from four different samples: a 1% random consumer credit panel, a random sample of the student loan population, the subset of borrowers having student loans in delinquency and finally our sample of treated individuals. For all samples, we report averages for a panel that, similar to our sample, spans from Jan 2010 through Dec 2017. We find that our sample has the highest amount of debt balance outstanding with about $49,900, they have the lowest number of credit card accounts, 3 versus an average of 11 of the general population and the lowest fraction of

mortgages, which is also indicative of our sample being younger (34 years compared to 49 of the consumer credit panel). They also exhibit an average of 5 accounts past-due with an average $6,000 past-due amount, compared to about 0.4 accounts and $1,400 of the general population. While there are significant differences with the average borrower, in many respects, our sample of treated individuals is similar to the delinquent student loan population, e.g. total debt balance, number of accounts, and age. The most notable differences are the higher credit card balance of our sample, but lower mortgage and auto balance compared to the benchmark sample. Overall, these comparisons show that, as we would expect, our treatment sample is on average more constrained, younger and has lower assets than that of the average borrower.

To complement the previous statistics, we also investigate the geographical distribution of these borrowers across the US. Panel A of Figure 1 plots a heat map of the US showing the geographical distribution of delinquent student loan borrowers based on a random sample of the credit bureau data. It shows that the delinquency is quite spread out across the US but with a higher incidence in California, Texas and Florida. Panel B of Figure 1, instead, shows the geographical concentration of our treated individuals which are similarly present across several states in the US. Figure 2 complements the previous one by plotting the number of lawsuits settlements matched to the credit file over our sample period. We find that these are present throughout the sample but spike during the 2014-2017 period.

2.5. Student debt relief validation

Before evaluating our main outcomes, we first verify the effect of student debt relief on student loan balance and credit score for treated borrowers in our sample. We find that, on average, debt relief leads to a decline in student loan balance by $6,855.52. This decline is substantial for borrowers in our sample whose average monthly income is $2,376.71. However, there is ample variation in this decline in student loan balance experienced by different borrowers as reflected by the standard deviation of 11,602.75. We utilize this variation to further validate our main results in Section 4.

Formally we estimate this effect on student loans using our baseline specification. Table 2 reports estimates for this analysis which includes both treated and control borrowers. All columns control for individual fixed effects and county by event-month fixed effects. We begin this analysis by

examining the effect of debt relief on the number of student loan accounts in Column (1). We find that on average borrowers who experience debt relief have 0.65 fewer student loan accounts relative to borrowers who were delinquent but did not experience debt relief. This is consistent with student loan account getting closed following court judgments. We examine the effect on student loan balance in Column (2) which shows a decline of about $5,320 for the treated borrowers relative to the control group following debt relief. Taken together, these results verify a decline in student debt following court judgments in our sample. In Column (3), we analyze the effect of debt relief on credit scores. When debt relief gets reflected on credit reports, it can potentially affect credit scores. We find that credit scores increase for borrowers experiencing relief from their student loans relative to the control group.

3. Main Results

This section describes the main results of the paper distinguishing between the effects of the discharge on different credit and labor market outcomes including leverage, delinquencies, bankruptcy, medical defaults, mobility, income and durable consumption.

3.1. (De)Leveraging

The first hypothesis we analyze is whether the sudden student debt discharge affects the borrowers' behavior with their other credit accounts, as an indication of their financial health post-discharge. On the one hand, the discharge has a wealth effect but does not increase the disposable income of these borrowers, and so it might have limited effects. On the other hand, borrowers might be trying to improve their financial situation after getting this break to avoid ending up in similar trouble in the future.

Table 3 examines the effect of the debt discharge on leverage. All columns include individual fixed effects and county by event-month fixed effects which allows us to control for time invariant individual level characteristics and any time-varying differences between regions. The first step towards a better understanding of how the affected borrowers change their leverage is to examine the extensive margin on their total debt and components of debt, that is, whether they tend to change their number of

accounts in total and across different credit types. When we consider total number of accounts other than the student loans in Column (1) of Panel A, we find that it significantly decreases relative to the control group. Columns (1) through (3) of Panel A examine the effects on the number of different accounts. We find that consistently across all debt categories, the treated borrowers are significantly more likely to reduce the number of accounts.

On the intensive margin in Panel B, we also find that the total debt balance of the borrowers that experienced the discharge is significantly lower than that of the control group. Column (1) shows that borrowers reduce their balance by over four thousand dollars. Given an average balance of $15,317 in the pre-period, this corresponds to a 26 percent reduction. Columns (2)-(4) explore the intensive margin across different credit types and find that on average the credit card balance is reduced by at least $360, their auto loan balances decline by about $220 and their mortgage balances decrease by about $900. Overall, these findings suggest that treated individuals are significantly more likely to reduce their leverage after the debt is discharged.

Although the result of the legal disputes should be orthogonal to borrowers' behavior, an important assumption of our analysis is that the treatment and the control group were on parallel trends in the pre-period. Figure 3 shows that this is indeed the case. It plots the dynamic coefficients of our baseline regression and shows that, while the treatment and the control group are indistinguishable from each other in the pre-period, the treated borrowers tend to dramatically reduce their total debt balance (excluding the student loan discharged) right after it gets discharged, and they continue doing so for several months after the event. Note that there might be few weeks delay between the court decision and the date when the discharge is reported in the credit report.

To ensure that our results are driven by changes in total debt balance for treated individuals and not control individuals, we estimate our dynamic baseline regressions separately for both group of individuals and plot the coefficients in Figure OA 1 of the Online Appendix. The blue color represents the treated individuals while the red color represents the control group. Similar to Figure 3, the plot shows that both treated and control group experienced similar changes in total debt balance (excluding student loan discharged) in the pre-period. However, they diverge following debt discharge as total balance declines significantly more for the treated group relative to the control group.

Next, we examine in Table 4 how this deleveraging occurs. Panel A focuses on credit cards, Panel B on auto loans and Panel C on home loans. Column (1) of Panel A show that the borrowers are significantly less likely to open an account. Column (2) provides evidence that treated borrowers tend to use the existing accounts less as their utilization decreases by about 2%, which is equivalent to a 6-percent reduction with respect to the average of 34%. Column (3) shows that deleveraging is also partially driven by an increase in repayment above the minimum payment. We complement these results by examining the dynamics of this behavior in Figure 4, which focuses on revolving utilization and shows that while there is no significant difference in the utilization ratio between borrowers that get their loans discharged and those who do not in the pre-period, we find that there is significant wedge right after the legal decision. Figure OA 2 plots this dynamics separately for the treated and control groups and corroborates the finding that changes in credit card utilization were similar across both groups in the pre-period but diverged after debt discharge as utilization reduced for the treated (blue color) individuals but remained at similar levels for the control group (red color).

Panel B examines whether the borrowers' behavior for auto loans is any different. Similarly to Panel A, we look at the account opening and payments, but rather than utilization, we examine the response in the origination amount. We find that in the case of auto loans, most of the effects are driven by smaller auto loan originations compared to the control group, with a reduction of about \$690, and higher payment amounts. Panel C shows a similar pattern for mortgages after the student debt is discharged: treated borrowers exhibit significantly smaller mortgage originations, with an average effect of \$9,400, and higher payment on their accounts.

Finally, we can exploit the richness of our data to show that these results are driven by the borrowers' deliberate choice of reducing their demand for credit by analyzing credit inquiries. Our data contain information on hard inquiries for any credit application. This allows us to test whether the borrowers demand more credit after their student loans get discharged. Columns (1) and (2) of Table 5 focus on the number of inquiries in the past 30 days and an indicator for multiple inquiries as main dependent variables respectively. The results show that treated individuals reduce their demand for credit as credit inquiries decrease significantly after the discharge.

Overall, these results provide evidence that one of the effects of relieving borrowers from their

student loans is to allow them to better manage their finances and start significantly deleveraging which is likely to make them more resilient to negative shocks.

3.2. Delinquency and bankruptcy

A natural question at this point is whether the treated individuals are likely to end up in default again after the discharge. On the one hand, the findings discussed above would suggest that the lower leverage relative to the control group would reduce the likelihood to being delinquent on their accounts. On the other hand, the borrowers that ended up in default the first time around might be more likely to be subject to similar negative shocks in the future and, since they are likely credit-constrained, they might find themselves unable to meet their obligations again.

We test this hypothesis in Table 6. Panel A investigates the extensive margin, i.e., whether the borrowers are likely to default, by differentiating between total delinquency (which excludes the student loans) and being delinquent on credit cards, auto loans or mortgages. By comparing the results across accounts, we find that treated individuals are 11% less likely to experience any type of default in the post period. Most of this effect comes from a significant reduction, about 10%, in the likelihood of being delinquent on credit cards payments. The effects for auto loans and mortgages are statistically significant but smaller in magnitude.

Figure 5 reports the dynamic coefficients for the probability of being delinquent on any account (except the student loans subject of the collection attempt by National Collegiate). We find that, although treatment and control group exhibit a very similar delinquency behavior for a long period of time before the discharge, about three months after it, the treated borrowers are significantly less likely to be delinquent on any account. This reassures us about our identification strategy and shows that the effects we find are quite consistent and economically significant for the treated individuals.

In Figure OA 3, we examine whether this decline in delinquencies is driven by treated or control groups. The plot shows that in pre-period, the changes in delinquencies was similar across both groups, however the treated group experienced significantly lower likelihood of delinquencies in the period following discharge.

Panel B of Table 6 quantifies these effects by looking at the delinquency amounts. We find that on average the treated borrowers exhibit about $400 lower delinquency amount, which is equivalent

to a 18% reduction. While there is no significant difference in mortgages, we find that both credit card and mortgage delinquencies decline by $60.

Our data allows us to examine other related outcomes associated with credit delinquencies such as bankruptcy, foreclosures and medical defaults. Table 7 reports these effects where the outcome variables include an indicator variable for bankruptcy in Column (1), an indicator variable for foreclosure in Column (2), and an indicator variable for defaulting on medical bills in Column (3). Consistent with our delinquency results, we find that treated individuals are 0.1% less likely to be in bankruptcy and 0.4% less likely to experience a foreclosure. In a similar vein, they are also less likely to default on their medical bills.

Taken together, we find further evidence that the borrowers significantly improve their financial conditions in the aftermath of their student loan being discharged, as they have lower debt balances and are significantly less likely to being in default.

3.3. Mobility and Income

Having established that borrowers whose student debt is discharged are able to improve their credit outcomes, we now investigate whether the discharge also improves their real outcomes. One of the key channel through which student debt relief might improve borrowers' situation is by reducing the extent to which these borrowers face debt overhang problems. Specifically, after the debt being discharged, borrowers might have more flexibility in pursuing other jobs and potentially better opportunities. This hypothesis has been at the forefront of the policy debates about the costs of rising tuition costs and of student debts being out of control.

We test this hypothesis by examining both mobility and income for borrowers. Table 8 presents estimated coefficients from our baseline regressions using different forms of mobility and dollar value of income as dependent variables. In column (1), we first measure geographical mobility as changes to the borrowers' ZIP code of residence. Similar to the previous tables, our specification includes individual fixed effects and county by event-time fixed effects. We find that borrowers that see their student loan discharged are significantly more likely to move. The effects are both statistically and economically significant; in fact, the treated borrowers are about 5% more likely to move to a different ZIP code in the post period than similar borrowers that still suffer from the student loan burden.

A complementary way of investigating whether treated borrowers are able to improve their economic conditions is to exploit the granularity of our data, for a restricted sample of borrowers, to test if borrowers' job mobility increases by examining employment changes. Although the test is low-powered due to the lower number of observations, column (2) of Table 8 provides evidence that this is indeed the case: borrowers whose student debt gets discharged are more likely to change jobs relative to the control group of similar borrowers.[12] Columns (3) and (4) examine the characteristics of this increased mobility and complement these results by showing that borrowers experiencing debt discharge are more likely to move to a new industry and, more importantly, to a higher paying industry.

Finally, column (5) complements the previous findings by quantifying the increased income that borrowers, who are not constrained by student debt anymore, are able to achieve in the aftermath of the discharge. We find that treated borrowers do exhibit higher income in the post period compared to the control group by about $80. We can use this estimate to quantify the cumulative income gained over the three years after discharge to be $79.72*37 = $2,949.64. This is a pretty substantial gain as it is equal to over 1.25 months' salary for the average individual in our sample.

Figure 6 plots the dynamic coefficients for income that compare changes in the outcome variable between treated and control groups. We find that, although both groups exhibit very similar income trends for a long period of time before the discharge, income for treated borrowers gradually increases after the discharge. In Figure OA 4, we plot the dynamic coefficients for the treated and control groups separately. The plot shows that in pre-period, the changes in income was similar across both groups, however the treated group experienced significantly higher income in the period following discharge.

Overall, we find that treated borrowers are more likely to change home, job and earn more. These findings strongly suggest that the increase in student loans burden for young borrowers might be an important drag on their economic outcomes by limiting their ability to pursue better opportunities. If on the one hand these are the costs of the looming student debt crisis, these findings can also inform the debate about the potential benefits of intervening in this market.

[12]Table OA 4 shows that our results on credit outcomes with this restricted sample are similar to the baseline estimates.

3.4. Durable consumption

A natural question at this point is to see whether there is any expansionary effect of the debt discharge. Although we do not have a comprehensive consumption measure, we can follow the existing literature and use car purchases as a proxy for durable consumption. The idea being that after the debt discharge these borrowers are more likely to be able to afford a car purchase, both because of the increased income that we have documented and because of the easier access to credit. Table 9 reports the effect of debt relief on car purchases and finds that borrowers do increase their consumption in the aftermath of the debt relief. This evidence suggests that debt discharge not only helps borrowers to better manage their finances and increase income but also allows them to increase their level of consumption.

4. Mechanisms & Heterogeneity

This section discusses plausible mechanisms and heterogeneity in the effects we document.

4.1. Plausible Mechanisms

Discharging debt for defaulted borrowers can affect their credit and labor market outcomes for a number of reasons. For instance, borrowers may have defaulted owing to liquidity constraints in the first place which in turn might have reduced their ability to move or change jobs. Relieving these borrowers from outstanding debt would reduce their constraints and allow them greater flexibility to look for better opportunities. In our setting, for the sub-sample of borrowers on which we have payment data we find that most had stopped making payments on their student loans. Hence, relieving them from debt on which they were delinquent is less likely to give them access to higher disposable income. This makes it less likely that liquidity constraints drive our results. However, they do expect to be collected upon at some point in the future, with their wages potentially garnished by creditors, so the discharge might potentially relieve them from future liquidity constraints.

Liquidity constraints may potentially also operate through the control group of borrowers whose wages may be garnished as part of collections. If higher levels of liquidity constraints are imposed on the control group during the post period relative to the treated group, it may drive our results. To

evaluate this potential channel, we examine the heterogeneity in effects across borrowers that reside in states with different levels of restrictions on wage garnishment. Following Lefgren and McIntyre (2009) and Kalda (2019), we split the sample into borrowers that reside in states with severe, medium and no restrictions on wage garnishment. Table OA 5 reports results for this analysis where the dependent variables include total debt balance excluding student loans in Column (1); mortgage balance in Column (2); revolving utilization in Column (3); indicator of any delinquent account in Column (4); indicator of moving to different ZIP code in Column (5); and dollar value of income in Column (6). Across different levels of restrictions on wage garnishment, we find similar effects of debt relief on borrower outcomes further suggesting that liquidity constraints likely doesn't play an important role in our setting.

Debt discharge may also lead to changes in credit scores for borrowers which may directly or indirectly affect their opportunity set. We evaluate the importance of this channel in our setting by estimating our baseline effects after controlling for credit score changes in a non-parametric manner. Comparing the estimates for this analysis with our baseline estimates would shed light on the importance of this channel in our setting. Table 10 reports results for this analysis where in addition to individual and county $\times$ event-month fixed effects, we also control for credit score decile $\times$ event-month fixed effects. The estimates become stronger than our baseline coefficients when we control for credit score changes. This suggests that changes in credit score is likely not an important mechanism in our setting otherwise one would expect to find smaller magnitudes by controlling for that channel.

Another potential mechanism through which debt discharge may affect borrowers' labor market outcomes is removal of delinquency flag. Delinquency flag on borrowers' credit report may cut them off from certain opportunities in the labor market because employers could potentially check for such information. Removing such flags from the report would allow borrowers to access the labor market more freely. This might be a potential channel driving our results.

Alternatively, discharging debt may also relieve borrowers from associated debt overhang problems ultimately changing their incentives to provide labor supply and look for better opportunities. If debt overhang is important in our setting, one would expect to find stronger effects for borrowers that experience larger amounts of debt relief. Table 11 evaluates this heterogeneity where we esti-

mate our baseline results for two sub-samples split by different levels of debt relief amount. Panel A (Panel B) reports estimates for the sub-sample where the debt relief amount is above (below) median level. As before, the dependent variables include total debt balance excluding student loans in Column (1); mortgage balance in Column (2); revolving utilization in Column (3); indicator of any delinquent account in Column (4); indicator of moving to different ZIP code in Column (5); and dollar value of income in Column (6). We find stronger results for the sub-sample of borrowers who experience above median levels of debt relief. In fact, our expansionary results in terms of higher mobility and income are concentrated within the sub-sample experiencing above median levels of discharge for which the average debt relief is $12,259.61. These results highlight the importance of debt overhang in our setting.

Finally, relieving student debt for delinquent borrowers may also lead to higher income through it's effect on labor productivity. If being in default adversely affects productivity, similar to the effect of negative home equity (Bernstein, McQuade and Townsend 2019), relieving debt can potentially alleviate these adverse effects and may lead to an increase in income. Debt relief may also lead to an increase in income if increased potential to move allows higher bargaining power to the employees (Gopalan et al 2018).

4.2. Heterogeneity

We complement the previous analysis by exploring whether our results depend on borrowers' characteristics. First, borrowers of different ages might respond very differently to the debt relief shock. For instance, older borrowers might be more likely to try to quickly improve their finances in light of a closer retirement, or to have a different propensity to move to take advantage of better job opportunities. This hypothesis is also related to the standard models of life cycle behavior such as Browning and Crossley (2001). We can formally test this hypothesis in Panel A of Table 12, where we modify our baseline specification by interacting the main coefficient, $DebtRelief \times Post$, with an indicator that identifies borrowers older than the median (35 years). The dependent variables are total debt balance in Column (1); mortgage balance in Column (2); revolving utilization in Column (3); indicator of any delinquent account in Column (4); indicator of moving to different ZIP code in Column (5); and dollar value of income in Column (6). The results show that older borrowers tend

to reduce their debt balances by more than $4,500 relative to the younger borrowers. Furthermore, they are also 10% less likely to default after the debt relief shock and slightly more likely to move.

An additional source of heterogeneity that we exploit is the level of the total debt balances, excluding the student loans, which proxies for the extent to which these borrowers are constrained. Panel B of Table 12 shows that this is indeed an important source of heterogeneity. More constrained households tend to reduce their total outstanding debt balances by over $7,000 and in particular their mortgage balance by about $1,100. This deleveraging makes them less likely to default on any other account after the debt relief shock. The effects are both statistically and economically significant, with a reduction in defaults of 10%. These individuals are also more likely to move and earn higher income. Overall, the heterogeneity of these results can be informative of the sub-population more likely to experience the biggest benefits of a potential debt relief program.

5. Discussion

We can now discuss the implications of our results for policymakers by contrasting them with the existing literature.

One key policy question highlighted by the millions of borrowers delinquent on their mortgages during the recent financial crisis is how to better support them to go back on their feet, e.g. by targeting monthly payment reduction or principal write-offs. Similarly, the staggering increase in student loan defaults has policymakers debating these issues. Although some theoretical work has suggested the benefits of debt write-downs in the context of the mortgage crisis (see, for instance, Eberly and Krishnamurthy 2014, and Haughwout, Okah, and Tracy 2016), the evidence has suggested that addressing short-term liquidity constraints might be significantly more successful.

In particular, Ganong and Noel (2018) exploit the fact that, through the Home Affordable Modification Program (HAMP), some underwater borrowers received payment reductions for the first five years, due to a maturity extension of their obligations, while others also received an average of $67,000 in mortgage principal forgiveness. Then, the authors estimate the effects of changes in wealth, due to a reduction in long-term obligations, and changes in liquidity, due to lower payments, on defaults and consumption. The key insight is that, while lower payments lead to lower likelihood

of defaulting and higher consumption, mortgage principal reduction has no positive impact on either outcomes.

Our results suggest that the student debt market might require different policy interventions. Specifically, by analyzing a setting where monthly payments stays at zero, because the borrowers have stopped paying, but the debt is charged off, and by showing that this discharge does have significant effects on these borrowers' outcomes, we draw different conclusions than those in Ganong and Noel (2018).

There might be several potential reasons for these differences. First and foremost, student loans are not dischargeable in bankruptcy, which might make these borrowers significantly more sensitive to debt write-offs than mortgagors. Consider the case of underwater borrowers in non-recourse states, where defaulting on their mortgages might lead to the foreclosure of their homes, but not to income garnishment; in contrast to defaulting on student loans, which would lead to income garnishments and, because there is no statute of limitations, collections will continue even after the defaulted loan disappears from the credit report. Second, it is possible that liquidity constraints may be less important in the student loan market, where delinquent borrowers might postpone their payments with deferment or forbearance. Third, underwater borrowers' behavior might be motivated by their desire to keep their homes, which would make them sensitive to any immediate intervention to avoid foreclosure. In contrast, the borrowers in our sample have been in default for some time, due to job losses or health shocks, and might not expect to be ever current on their student loans again.

Overall, our conclusions about the importance of debt overhang problems are consistent with recent evidence in the case of credit card modification programs provided by Dobbie and Song (2019), which shows that, despite taking effect after several years, interest write-downs significantly improved the borrowers' financial and labor market outcomes, while they find no positive effects of payment reductions. While we cannot examine how student loan borrowers would react to changes in monthly payments within our setting, our results strongly suggests that, for severely distressed borrowers, debt discharge might significantly improve the borrowers' outcomes.

6. Robustness

Although we have limited concerns related to the potential differences between treatment and control group by including a number of controls and selecting borrowers in similar economic conditions in the first place, we can explore variation in the timing of the discharge to show the robustness of our findings. Specifically, rather than comparing borrowers whose loan get discharged because held by National Collegiate with those whose loan is not discharged, we can take advantage of the fact that not all loans are discharged at the same time. Then, we can compare borrowers who are discharged to those who are not discharged yet. This is helpful in mitigating any concern that somehow the discharge is correlated with unobservable characteristics of the borrowers driving the likelihood to being held by National Collegiate in the first place (although if that was a concern it should have shown up in the pre-trends).

Table 13 reports results from similar difference-in-differences regressions to the previous ones but focusing only on the treated group of individuals. Column (1) reports results for total borrower's debt balance, Column (2) focus on mortgage balance, Column (3) on credit utilization, Column (4) delinquent accounts, while Columns (5) and (6) examine the effects on mobility and income respectively. We find very consistent results with the baseline specifications as the borrowers that see their student loan discharged tend to reduce their liabilities, are less likely to be delinquent, but more likely to move and increase their income.

In addition, we conduct a robustness test to further ensure that our results are not driven by the choice or number of control individuals in our sample. Specifically, from within our baseline sample we use propensity score matching to select one control individual for every treated individual who resides in the same ZIP code, is of the same age, holds similar balance on their student debt and is closest in terms of total outstanding balance on their debt both on extensive and intensive margins, and number of delinquent accounts. Table OA 7 reports results for this estimation where we find similar results as our baseline estimates.

Our baseline specification purposely examines outcome for borrowers 36 months around treatment because one may expect some of the effects to manifest over a few months following court judgments. However, our results are also robust to confining our analysis to a balanced panel one year around treatment as reported in Table OA 3. As suspected, some results are smaller in magnitudes as the

effect of debt relief becomes stronger in due course following treatment.

A potentially interesting issue to investigate is whether borrowers strategically default on their student loans after the first few cases are dismissed as borrowers may be able to anticipate debt relief in the latter part of the sample period. This might also lead them to react differently to debt relief relative than those for whom the relief is completely unanticipated. [13] To evaluate the importance of these arguments, we examine the effects of debt relief on borrower outcomes for borrowers whose debt was discharged in first and second halves of the sample period separately. Table OA 6 reports estimates for this analysis where we find similar results across both sub-samples. We find similar effects of student debt relief regardless of whether it is in the first or second half of the sample.

7. Conclusion

A crisis in the student loan market has been looming over the economy, due to an explosion in recent graduates' indebtedness since the Great Recession and a worrisome increase in delinquency. Several policies have been advocated to help borrowers unable to meet their financial obligations, especially in the private student loan market, which is usually tapped by more fragile borrowers attending for-profit institutions and experiencing lower returns to education. Although these issues have spurred growing interests, we still know very little about what would be the benefits of offering some type of debt relief to borrowers in need. Furthermore, policy makers would need guidance on the type of policies that are likely to be effective in this market, from those addressing the immediate liquidity constraints of some of these borrowers to more ambitious policies aimed to forgive a portion of their debts. The main challenge faced by the existing literature has been the inability to observe detailed information about borrowers' balance sheets and decisions over time coupled with the difficulty to infer the causal link between debt and behavior due to the lack of plausibly-exogenous variation in the data.

This paper overcomes these challenges by taking advantage of the debt discharge that affected thousands of borrowers across the US due to the inability of National Collegiate to prove chain of title of the debts and by matching hand-collected lawsuits filings with individual credit bureau

[13] These concerns may be assuaged to the extent that borrowers are less likely to have information on whether or not their loan is owned by National Collegiate.

information. This allows us to build a unique panel dataset enabling us to estimate the effects of debt relief on borrowers.

We find that the borrowers experiencing the debt relief shock are significantly more likely to engage in deleveraging, by both reducing their demand for credit and limiting the use of the existing accounts. That is, borrowers benefiting from a debt relief seem to quickly try to improve their financial conditions. These efforts are successful in that they are also significantly less likely to default on their accounts, above and beyond their student loan accounts. These findings speak to the potential spillover effects across borrowers' liabilities and to an indirect benefit of intervening in the student loan market by helping borrowers unable to afford their student loan debts. Finally, debt relief helps these borrowers to overcome debt overhang constraints as they are significantly more likely to move, change job and experience a significant increase in income. Overall, these findings speak to the forceful impact that interventions in this market could have on these individuals.

References

Agarwal, Sumit, Chunlin Liu, and Nicholas Souleles. 2007. The Reaction of Consumer Spending and Debt to Tax Rebates Evidence from Consumer Credit Data. *Journal of Political Economy*, 115(6): 986-1019.

Albuquerque, Rui, and Hugo A. Hopenhayn, 2004, Optimal Lending Contracts and Firm Dynamics, *The Review of Economic Studies* 71, 285-315.

Amromin, Gene, Janice Eberly, and John Mondragon, 2018, The Housing Crisis and the Rise in Student Loans, Working Paper.

Avery, Christopher, and Sarah Turner, 2012, Student Loans: Do College Students Borrow Too Muchor Not Enough?, *Journal of Economic Perspectives 26*, 165-92.

Baum, Sandy, 2015, The evolution of student debt in the united states, in Brad Hershbein, and Kevin M. Hollenbeck, ed.: Student Loans and the Dynamics of Debt . 11-36 (WE Upjohn Institute).

Bennett, W. J., Our greedy colleges, 1987, *New York Times*, 18, A27.

Bernstein, Asaf, 2017, Negative Equity, Household Debt Overhang, and Labor Supply, Working Paper

Bernstein, Shai, Timothy McQuade, and Richard Townsend, 2019, Do Household Wealth Shocks Affect Productivity? Evidence from Innovative Workers During the Great Recession, *Journal of Finance* forthcoming

Bleemer, Zachary, Meta Brown, Donghoon Lee, Katherine Strair, and Wilbert van der Klaauw, Echoes of Rising Tuition in Students Borrowing, Educational Attainment, and Homeownership in Post-Recession America, Federal Reserve Bank of New York Staff Reports.

Bos, Marieke, Emily Breza, and Andres Liberman, 2016, The Labor Market Effects of Credit Market Information, Working Paper 22436, National Bureau of Economic Research.

Brown, Alexandra M, J Michael Collins, Maximilian D Schmeiser, and Carly Urban, 2014, State Mandated Financial Education and the Credit Behavior of Young Adults, Federal Reserve Board Finance and Economics Discussion Series.

Brown, Meta, John Grigsby, Wilbert van der Klaauw, Jaya Wen, and Basit Zafar, 2016, Financial Education and the Debt Behavior of the Young, *Review of Financial Studies*, 29, 2490-2522.

Browning, Martin, and Thomas F. Crossley, The Life-Cycle Model of Consumption and Saving, 2001, *Journal of Economic Perspectives*, 15, 3-22.

Burdman, Pamela, 2005, The Student Debt Dilemma: Debt Aversion as a Barrier to College Access, Center for Studies in Higher Education.

Carneiro, Pedro, James J Heckman, and Edward J Vytlacil, 2011, Estimating Marginal Eeturns to Education, *The American Economic Review*, 101, 2754-2781.

CEA, 2016, Investing in Higher Education: Benefits, Challenges, and the State of Student Debt, Council of Economic Advisers Report.

Cheng, I., Severino, F. and Townsend, R., 2017. Debt Collection and Settlement: Do Borrowers Under-Utilize the Court System. Working paper.

Cohen-Cole, Ethan, Kyle F Herkenhoff, and Gordon Phillips, 2016, The Impact of Consumer Credit Access on Employment, Earnings and Entrepreneurship, NBER Working Paper.

Cooper, Daniel, and Christina J. Wang, 2014, Student Loan Debt and Economic Outcomes, Federal Reserve Bank of Boston Working Paper.

Cordoba, Juan Carlos, and Marla Ripoll, 2013, What Explains Schooling Differences across Countries?, *Journal of Monetary Economics*, 60, 184-202.

Cox, Natalie, 2016, Pricing, Selection, and Welfare in the Student Loan Market: Evidence from Borrower Repayment Decisions, Mimeo.

Di Maggio, Marco, Amir Kermani, Benjamin J. Keys, Tomasz Piskorski, Rodney Ramcharan, Amit Seru, and Vincent Yao, 2017, Interest Rate Pass-Through: Mortgage Rates, Household Consumption, and Voluntary Deleveraging. American Economic Review 107(11), 3550-88

Dobbie, Will, and Paul Goldsmith-Pinkham. 2014. Debt Protections and the Great Recession, Unpublished Working Paper.

Dobbie, Will, Paul Goldsmith-Pinkham, and Crystal Yang. 2017. Consumer Bankruptcy and Financial Health. *Review of Economics and Statistics*, 99(5): 853-869.

Dobbie, Will, and Jae Song, 2015, Debt Relief and Debtor Outcomes: Measuring the Effects of Consumer Bankruptcy Protection. *American Economic Review*, 105(3): 1272-1311.

Dobbie, Will, and Jae Song, 2019, Targeted Debt Relief and the Origins of Financial Distress: Experimental Evidence from Distressed Credit Card Borrowers, Working Paper.

Eberly, Janice, and Arvind Krishnamurthy. 2014. Efficient Credit Policies in a Housing Crisis. Brookings Papers on Economic Activity, 45(2): 73-136.

Fos, Slava, Andres Liberman and Constantine Yannelis, Debt and Human Capital: Evidence from Student Loans. *Working Paper*

Fuster, Andreas, and Paul Willen. 2017. Payment Size, Negative Equity, and Mortgage Default. *American Economic Journal: Economic Policy*, 9(4): 167-191.

Galor, Oded, and Omer Moav, 2004, From Physical to Human Capital Accumulation: Inequality and the Process of Development, *The Review of Economic Studies* 71, 1001-1026.

Ganong, Peter, and Pascal Noel. 2018. Liquidity vs. Wealth in Household Debt Obligations: Evidence from Housing Policy in the Great Recession. NBER Working Paper No. 24964.

Gicheva, Dora, et al., 2011, Does the Student-Loan Burden Weigh into the Decision to Start A Family, Working paper.

Goldin, Claudia, and Lawrence F. Katz, 2008, The Race between Education and Technology (Belknap of Harvard UP).

Goodman, Sarena, Adam Isen and Constantine Yannelis, A Day Late and a Dollar Short: Subsidies to Human Capital Investment, Credit Constraints and Consumption Smoothing, 2019, Working Paper.

Gopalan, Radhakrishnan, Barton Hamilton, Ankit Kalda and David Sovich, Home Equity and Labor Income: The Role of Constrained Mobility. Working Paper.

Gross, David, and Nicholas Souleles. 2002. Do Liquidity Constraints and Interest Rates Matter for Consumer Behavior? Evidence from Credit Card Data. *Quarterly Journal of Economics*, 117(1): 149-185.

Herkenhoff, Kyle, Gordon Phillips and Ethan Cohen-Cole, The Impact of Consumer Credit Access on Self-Employment and Entrepreneurship, 2018, Working Paper.

Herkenhoff, Kyle, Gordon Phillips and Ethan Cohen-Cole, How Credit Constraints Impact Job Finding Rates, Sorting and Aggregate Output, 2019, Working Paper.

Haughwout, Andrew, Ebiere Okah, and Joseph Tracy. 2016. Second Chances: Subprime Mortgage Modification and Re-Default. *Journal of Money, Credit, and Banking*, 48(4): 771- 793.

Hoxby, Caroline, 1988, How Much Does School Spending Depend on Family Income? The Historical Origins of the Current School Finance Dilemma, *American Economic Review* 88, 309-314.

Johnson, David, Jonathan Parker, and Nicholas Souleles. 2006, Household Expenditure and the Income Tax Rebates of 2001. *American Economic Review*, 96(5): 1589-1610.

Kalda, Ankit. 2019, Peer Financial Distress and Individual Leverage. *Review of Financial Studies*, forthcoming.

Lee, Donghoon, Wilbert Van der Klaauw, Andrew Haughwout, Meta Brown, and Joelle Scally, 2014, Measuring Student Debt and Its Performance, FRB of New York Staff Report.

Lefgren, Lars, and Frank McIntyre, 2009. Explaining the puzzle of cross-state differences in bankruptcy rates. *Journal of Law and Economics* 52, 367393.

Lochner, Lance, and Alexander Monge-Naranjo, 2015, Student Loans and Repayment: Theory, Evidence and Policy, Working Paper 20849, National Bureau of Economic Research.

Lochner, Lance J., and Alexander Monge-Naranjo, 2011, The Nature of Credit Constraints and Human Capital, *American Economic Review*, 101, 2487-2529.

Looney, Adam, and Constantine Yannelis, 2015a, A Crisis in Student Loans? How Changes in the Characteristics of Borrowers and in the Institutions They Attended Contributed to Rising Loan Defaults, *Brookings Papers on Economic Activity.*

Looney, Adam, and Constantine Yannelis, 2015b, Is High Student Loan Debt Always a Problem?, SIEPR Policy Brief.

Lucca, David, Taylor Nadault, and Karen Shen, Credit Supply and the Rise in College Tuition: Evidence from the Expansion in Federal Student Aid Programs, 2019, *Review of Financial Studies*, 32, 423-466.

Lusardi, Annamaria, Olivia S Mitchell, and Vilsa Curto, 2010, Financial Literacy among the Young, *Journal of Consumer Affairs*, 44, 358-380.

Mayer, Christopher, Edward Morrison, Tomasz Piskorski, and Arpit Gupta. 2014. Mortgage Modification and Strategic Behavior: Evidence from a Legal Settlement with Countrywide. *American Economic Review*, 104 (9): 2830–57.

Melzer, Brian, 2017, Mortgage Debt Overhang: Reduced Investment by Homeowners at Risk of Default, *Journal of Finance*, 72 (2), 575-612

Mezza, Alvaro A., Daniel R. Ringo, Shane M. Sherlund, and Kamila Sommer, 2016, On the Effect of Student Loans on Access to Homeownership, Federal Reserve Board Finance and Economics Discussion Series.

Mian, Atif, and Amir Sufi, 2015, House of Debt: How They (and You) Caused the Great Recession, and How We Can Prevent It from Happening Again (University of Chicago Press).

Myers, Stewart C, 1977, Determinants of Corporate Borrowing, *Journal of Financial Economics*, 5, 147-175.

Rothstein, Jesse, and Cecilia Elena Rouse, 2011, Constrained After College: Student Loans and Early-Career Occupational Choices, *Journal of Public Economics*, 95, 149-163.

Scott-Clayton, Judith, and Basit Zafar, 2016, Financial Aid, Debt Management, and Socioeconomic Outcomes: Post-College Effects of Merit-Based Aid, Working Paper 22574, National Bureau of Economic Research.

Stephens, Melvin, and Dou-Yan Yang, 2014, Compulsory Education and the Benefits of Schooling, *The American Economic Review*, 104, 1777-1792.

Sun, Stephen Teng, and Constantine Yannelis, 2016, Credit Constraints and Demand for Higher Education: Evidence from Financial Deregulation, *Review of Economics and Statistics*, 98, 12-24.

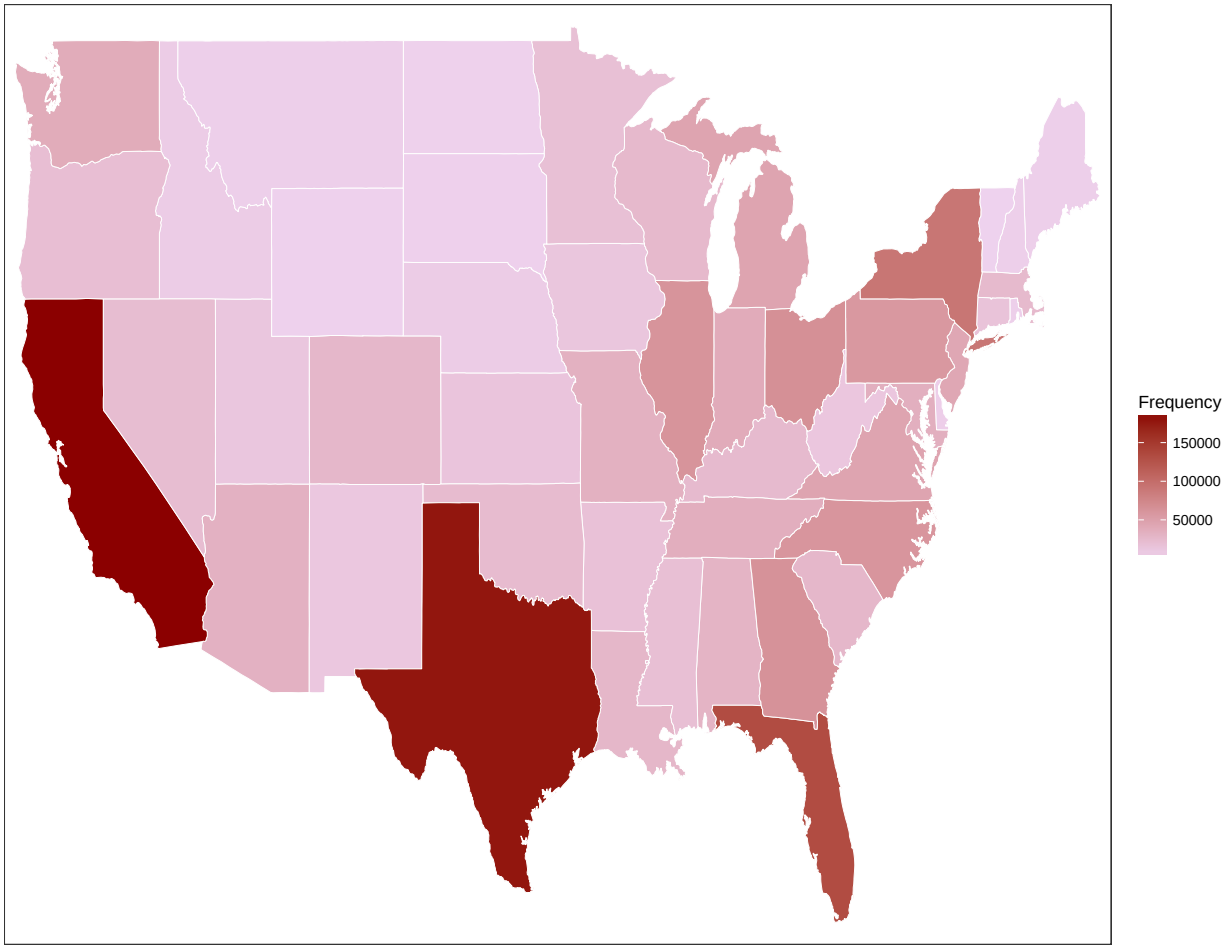
Yannelis, Constantine, 2016, Strategic Default on Student Loans, Working Paper.

Zhang, Lei, 2013, Effects of college Educational Debt on Graduate School Attendance and Early Career and Lifestyle Choices, *Economics 21*, 154-175.

Figure 1. Geographical Distribution of the Delinquent Student Loan Borrowers

The figures plot geographic distribution, at state level, of student loan borrowers. In Panel A, we plot total number of delinquent student loan borrowers based on complete credit bureau data. In Panel B, we plot number of treated individuals in our sample, who had delinquent student loans, but received debt relief due to favorable court rulings.

Panel A: All Delinquent Student Loan Borrowers



Panel B: Treated Individuals in Our Sample

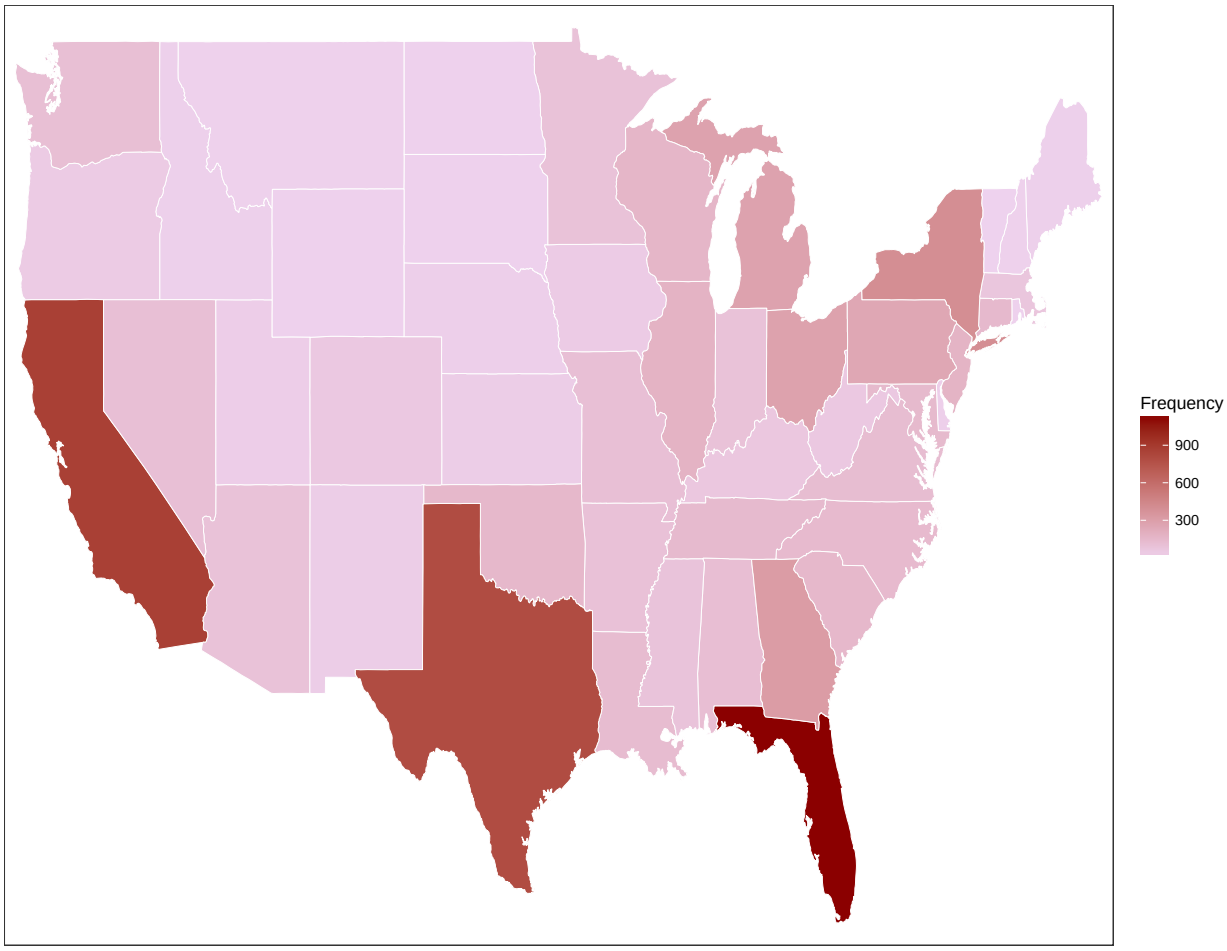


Figure 2. Number of Legal Settlements

The figure plots number of legal settlements over time. Y axis is the number of legal settlements we hand-collected from court cases. X axis is the court ruling month.

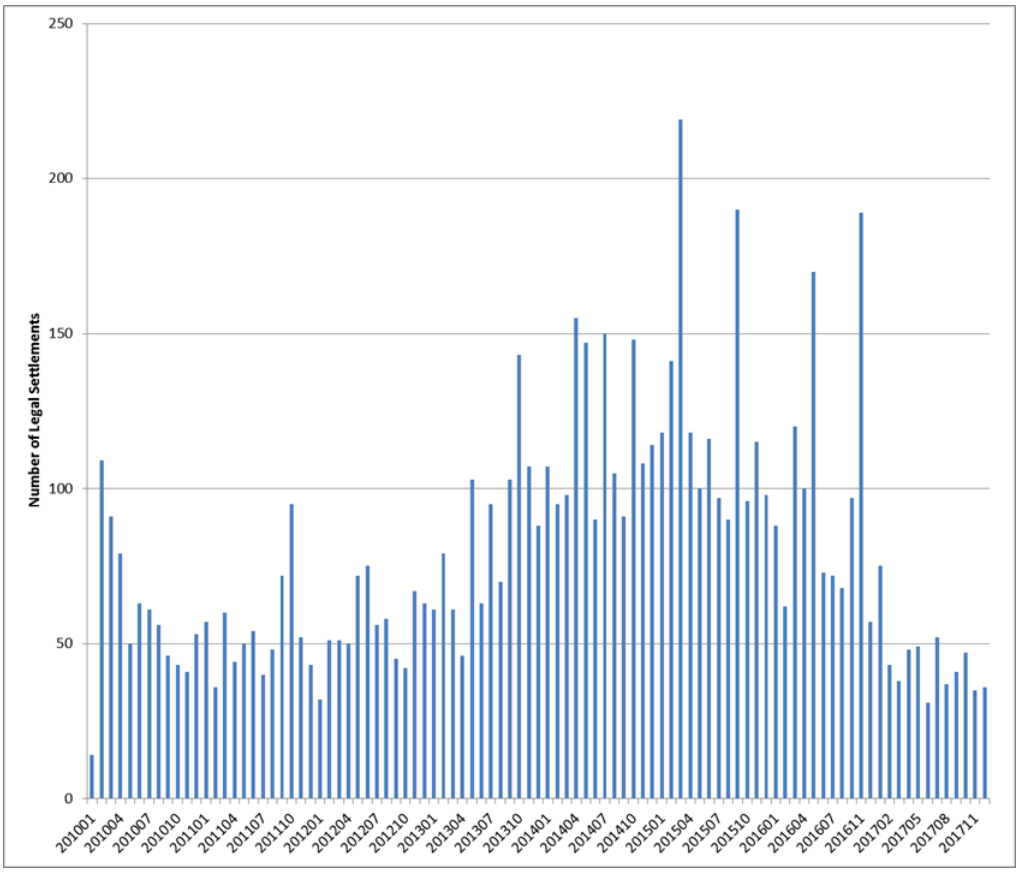


Figure 3. Dynamics of the Total Debt Balance

The figure plots the coefficients on the interaction term of treated borrower indicator and relative monthly dummies from regressions specified in Equation (2). Relative monthly dummies are defined as the interval, in months, from the debt discharge date to credit report date. Dependent variable is total debt balance (excluding student loans). On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level.

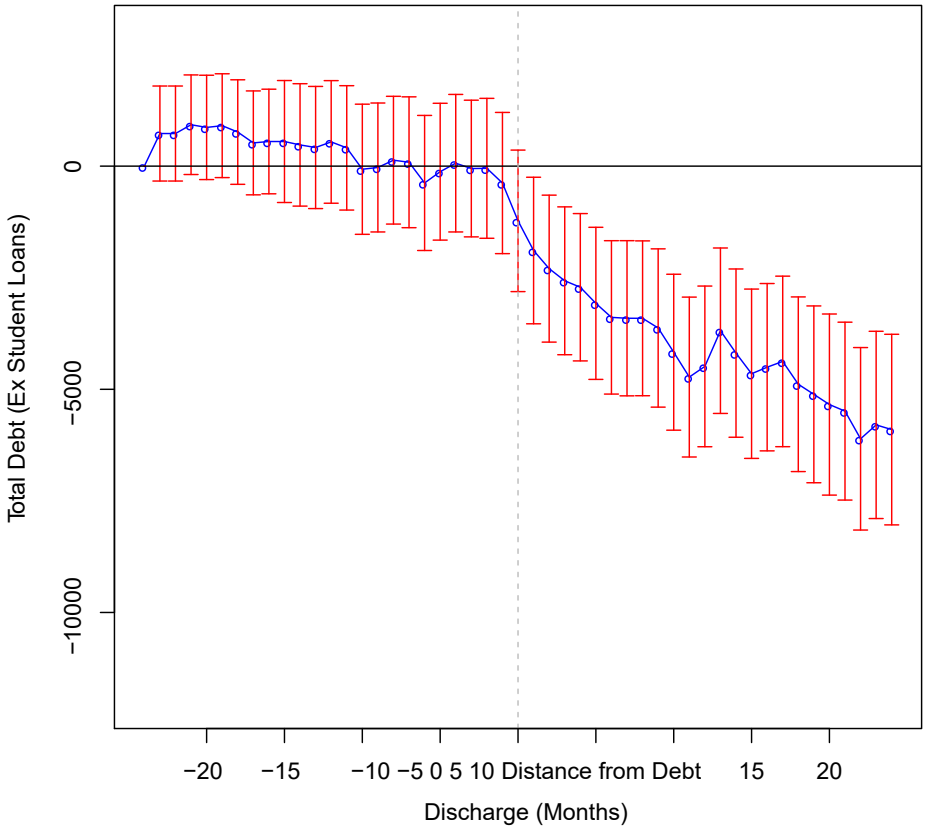


Figure 4. Dynamics of the Revolving Utilization

The figure plots the coefficients on the interaction term of treated borrower indicator and relative monthly dummies from regressions specified in Equation (2). Relative monthly dummies are defined as the interval, in months, from the debt discharge date to credit report date. Dependent variable is revolving utilization, calculated as ratio of revolving balance to revolving credit limit. It varies between 0 and 1. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level.

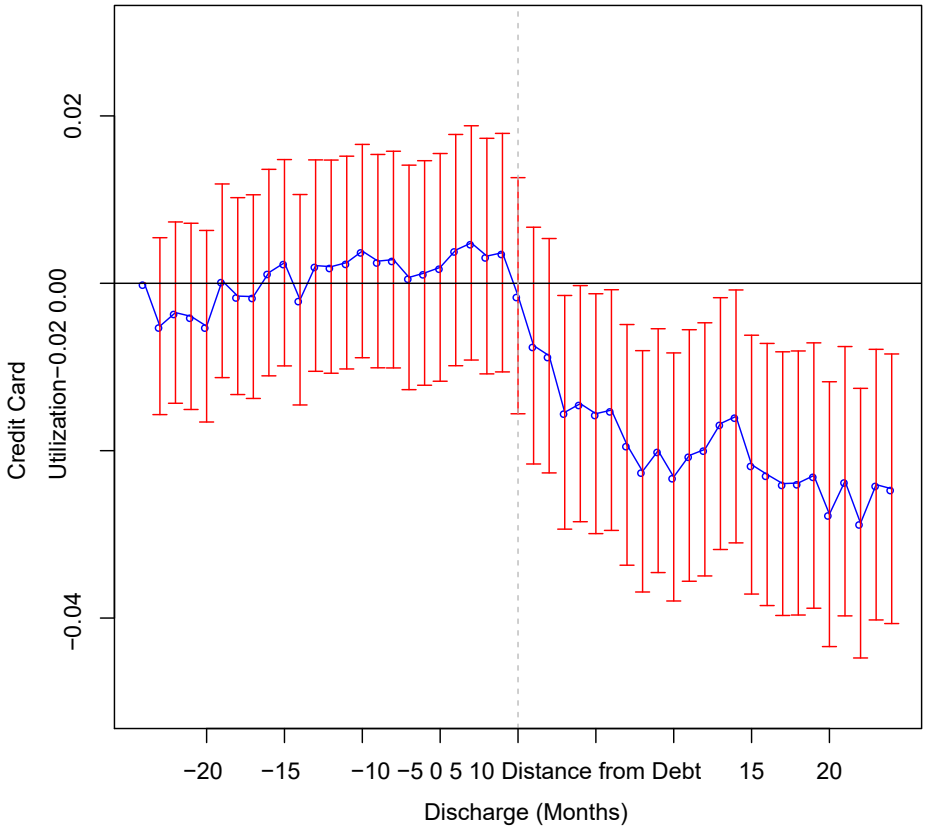


Figure 5. Dynamics of Delinquency Rate

The figure plots the coefficients on the interaction term of treated borrower indicator and relative monthly dummies from regressions specified in Equation (2). Relative monthly dummies are defined as the interval, in months, from the debt discharge date to credit report date. Dependent variable is the indicator of borrower having any delinquent account. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level.

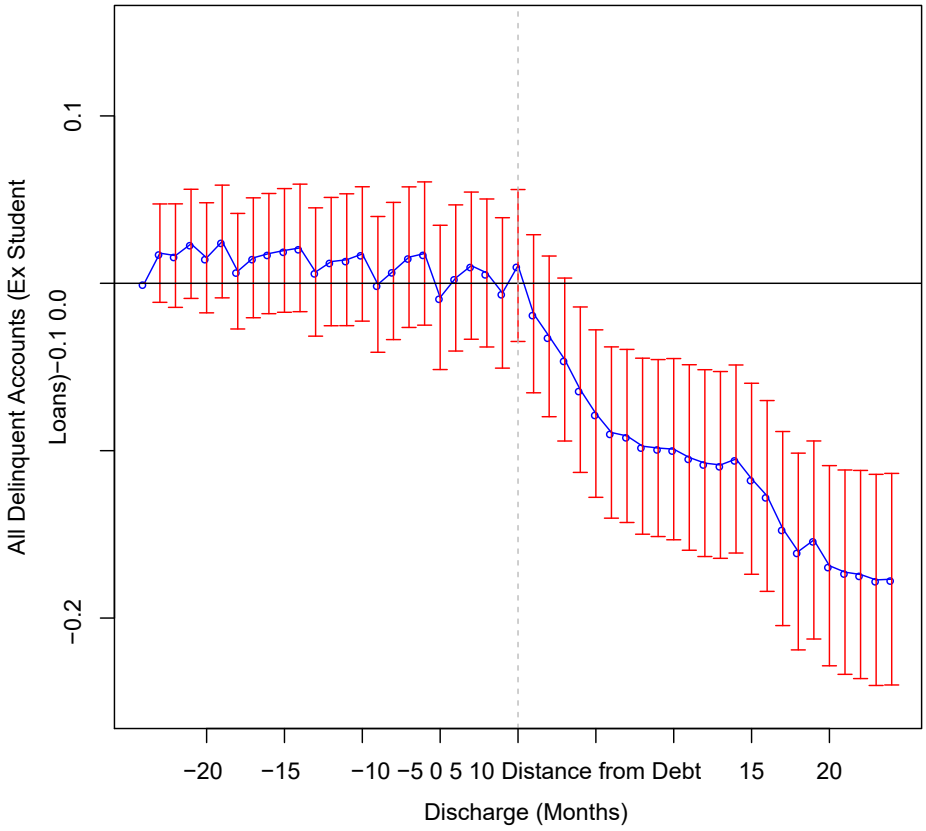


Figure 6. Dynamics of Income

The figure plots the coefficients on the interaction term of treated borrower indicator and relative monthly dummies from regressions specified in Equation (2). Relative monthly dummies are defined as the interval, in months, from the debt discharge date to credit report date. Dependent variable is dollar value of income. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level.

Table 1: Summary Statistics

This table reports summary statistics of individual borrower × month panel data. We hand-collected a set of borrowers who received student debt relief due to court rulings against national Collegiate and its collector agency, Transworld Systems. We consider a control group of borrowers living in the same ZIP Code, with the same age, a similar student loan amount to pay off, and most importantly, we restrict the control group borrowers that were also in default. Our sample contains both the treatment and control groups, excluding loans with missing credit score, missing total balance, missing number of accounts, and invalid loan balance (negative or zero). In Panel A, we report statistics for the main variables used in the analysis. All the variables are from credit report data from one of the credit bureaus. In Panel B, we compare the credit attributes of our sample with a random sample of the population and with the average borrowers with student loans for months between Jan 2010 and Dec 2017. Statistics for all borrowers outside of our sample are based on 1% Consumer Credit Panel (CCP).

Panel A: Statistics of the Sample

Variable	Mean	St. Dev.	Min	Median	Max
Number of Accounts	6.599	4.704	0	5	25
Total Debt Balance ($)	25,690.01	39,779.00	0	12,652	293,080
Total Debt Balance (Ex Student Loans, $)	16,300.29	130,076.15	0	7,930	293,080
Number of Accounts (Ex Student Loans)	2.901	3.284	0	2	25
Credit Card Accounts	2.116	2.589	0	1	13
Auto Accounts	0.538	0.757	0	0	3
Mortgage Accounts	0.115	0.421	0	0	3
Credit Card Balance ($)	1,132.53	2,431.23	0	0	18,017
Auto Balance ($)	3,943.34	7,021.75	0	0	31,877
Mortgage Balance ($)	4,422.04	22,359.52	0	0	175,443
Credit Card Utilization	0.341	0.338	0	0.258	1
Auto Loan Origination Amount ($)	20,629.78	12,724.36	550	17,339	77,868
Mortgage Origination Amount ($)	214,839.02	186,797.58	22,900	154,777	507,750
All Delinquent Accounts (Ex Student Loans)	1.302	1.864	0	1	17
Total Past-Due Amount (Ex Student Loans, $)	2,213.92	4,891.69	0	907	54,455
Mobility (1/0)	0.035	0.183	0	0	1
Income ($)	2,376.71	1,636.62	830.21	2,531.19	9,588.85
Credit Score	535.25	74.44	300	530	836

Panel B: Different Population and Samples

	All Borrowers (1% CCP)	All Student Loan Population	Delinquent Student Loan Population	Sample Treated Individuals
Number of Accounts	11.23	11.26	8.90	9.29
Total Debt Balance ($)	22,271.52	36,105.21	40,634.51	49,943.09
Credit Card Accounts	11.84	11.28	4.61	2.96
Auto Accounts	0.95	1.09	0.78	0.63
Mortgage Accounts	0.80	0.71	0.23	0.19
Credit Card Balance ($)	51.78	134.70	269.37	1829.39
Auto Balance($)	16,954.98	16,595.81	14,353.55	4,464.43
Mortgage Balance ($)	186,211.67	194,967.58	134,257.00	6,469.94
Credit Card Utilization	0.43	0.64	0.98	0.37
Delinquent Accounts	0.44	0.83	3.44	5.15
Total Past-Due Amount ($)	1,471.48	2,580.82	14,847.59	6,028.63
Age	49.32	37.79	39.52	34.75

Table 2: Student Debt Relief, Student Loan Balance and Credit Score

This table reports results from difference-in-differences regressions of student loan accounts and balance, and credit score based on borrower-month panel data. The dependent variable is the number of student loan accounts in Column (1); student loan balance in Column (2); and credit score in Column (3). $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Dependent Var	Student Loan Accounts	Student Loan Balance	Credit Score
	(1)	(2)	(3)
$DebtRelief \times Post$	-0.65***	-5319.04***	7.03***
	(0.05)	(148.94)	(0.98)
Individual FE	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes
Observations	6,010,381	6,010,381	6,010,381
R2	0.8	0.84	0.58

Table 3: Student Debt Relief and Debt Behavior

This table reports results from difference-in-differences regressions of consumer debt based on borrower-month panel data. In Panel A, the dependent variables are number of different types of accounts: total number of accounts excluding student loans in Column (1); number of credit cards in Column (2); number of auto accounts in Column (3); and number of mortgage accounts in Column (4). In Panel B, the dependent variables are total balances on different accounts: total debt balance excluding student loans in Column (1); balance of credit cards in Column (2); balance of auto accounts in Column (3); and balance of mortgage accounts in Column (4). $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Panel A: Number of Accounts

Dependent Var	No of Accounts (Ex. Stud)	Credit Card Accounts	Auto Accounts	Mortgage Accounts
	(1)	(2)	(3)	(4)
$DebtRelief \times Post$	-0.36***	-0.33***	-0.03***	-0.02***
	(0.02)	(0.02)	(0.01)	(0.00)
Individual FE	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes
Observations	6,010,381	6,010,381	6,010,381	6,010,381
R2	0.85	0.83	0.77	0.86

Panel B: Debt Balances

Dependent Var	Total Debt Balance (Ex. Stud)	Credit Card Balance	Auto Balance	Mortgage Balance
	(1)	(2)	(3)	(4)
$DebtRelief \times Post$	-4,303.21***	-369.44***	-226.81***	-888.24***
	(652.21)	(28.99)	(69.58)	(163.55)
Individual FE	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes
Observations	6,010,381	6,010,381	6,010,381	6,010,381
R2	0.8	0.83	0.77	0.86

Table 4: How Do Individuals Reduce Debt?

This table reports results from difference-in-differences regressions of consumer debt strategies based on borrower-month panel data. In Panel A, the dependent variables are changes in credit card accounts: number of accounts opening in Column (1); revolving utilization in Column (2); monthly payment in Column (3). In Panel B (C), the dependent variables are changes in auto (home) accounts: number of accounts opening in Column (1); origination amount in Column (2); monthly payment in Column (3). $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Panel A: Credit Cards

Dependent Var	Account Opening	Utilization	Payment
	(1)	(2)	(3)
$DebtRelief \times Post$	-0.002**	-0.018***	12.58***
	(0.001)	(0.004)	(1.990)
Individual FE	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes
Observations	6,010,381	6,010,381	1,299,622
R2	0.116	0.624	0.61

Panel B: Auto Loans

Dependent Var	Account Opening	Origination Amount	Payment
	(1)	(2)	(3)
$DebtRelief \times Post$	0.001	-691.74***	9.55***
	(0.001)	(197.140)	(4.330)
Individual FE	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes
Observations	6,010,381	6,010,381	1,291,613
R2	0.11	0.75	0.73

Panel C: Home Loans

Dependent Var	Account Opening	Origination Amount	Payment
	(1)	(2)	(3)
$DebtRelief \times Post$	-0.001**	-9,402.83**	38.98***
	(0.0004)	(3799.04)	13.10
Individual FE	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes
Observations	6,010,381	6,010,381	1,291,613
R2	0.2	0.9	0.77

Table 5: Student Debt Relief and Credit Demand

This table reports results from difference-in-differences regressions of consumer debt strategies based on borrower-month panel data. The dependent variable is number of inquiries in the past 30 days in Column (1) and an indicator of multiple inquiries in Column (2). $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Dependent Var	Total Inquiries (1)	Multi–Inquiry Indicator (2)
$DebtRelief \times Post$	-0.24***	-0.02***
	(0.050)	(0.005)
Individual FE	Yes	Yes
County x Event-Month FE	Yes	Yes
Observations	6,010,381	6,010,381
R2	0.56	0.45

Table 6: Student Debt Relief and Delinquency

This table reports results from difference-in-differences regressions of consumer delinquency outcomes based on borrower-month panel data. In Panel A, the dependent variables are number of delinquent accounts: number of all delinquent accounts excluding student loans in Column (1); number of delinquent credit card accounts in Column (2); number of delinquent auto accounts in Column (3); number of delinquent mortgage accounts in Column (4). In Panel B, the dependent variables are balance of delinquent accounts: balance of all delinquent accounts excluding student loans in Column (1); balance of delinquent credit card accounts in Column (2); balance of delinquent auto accounts in Column (3); balance of delinquent mortgage accounts in Column (4). $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county $\times$ event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Panel A: Extensive Margin

Dependent Var	All DLQ Accounts (Ex. Stud)	Credit Card DLQ Accounts	Auto DLQ Accounts	Mortgage DLQ Accounts
	(1)	(2)	(3)	(4)
$DebtRelief \times Post$	-0.11***	-0.10***	-0.01**	-0.01***
	(0.020)	(0.020)	(0.004)	(0.003)
Individual FE	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes
Observations	6,010,381	6,010,381	6,010,381	6,010,381
R2	0.74	0.74	0.7	0.76

Panel B: Intensive Margin

Dependent Var	All DLQ Amount (Ex. Stud)	Credit Card DLQ Amount	Auto DLQ Amount	Mortgage DLQ Amount
	(1)	(2)	(3)	(4)
$DebtRelief \times Post$	-375.93***	-61.09***	-59.22***	-7.62
	(60.46)	(11.95)	(15.95)	(5.97)
Individual FE	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes
Observations	6,010,381	6,010,381	6,010,381	6,010,381
R2	0.63	0.64	0.61	0.49

Table 7: Student Debt Relief, Bankruptcy and Medical Defaults

This table reports results from difference-in-differences regressions of consumer bankruptcy and medical default outcomes based on borrower-month panel data. The dependent variable is an indicator for bankruptcy in Column (1); an indicator for foreclosure in Column (2); and an indicator for medical defaults. $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level. All coefficients are standardized by a factor of 100 for ease of interpretation. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Dependent Var	Bankruptcy	Foreclosure	Medical Defaults
	(1)	(2)	(3)
$DebtRelief \times Post$	-0.1***	-0.04***	-0.1***
	(0.01)	(0.01)	(0.02)
Individual FE	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes
Observations	6,010,381	6,010,381	6,010,381
R2	0.43	0.24	0.07

Table 8: Student Debt Relief, Mobility and Income

This table reports results from difference-in-differences regressions of consumer mobility and income outcomes based on borrower-month panel data. The dependent variable are indicators of moving: mobility based on moving to a different ZIP code in Column (1); job mobility based on moving to a different job in Column (2); job mobility based on moving to a job in different industry (NAICS two-digit) in Column (3); job mobility based on moving to a higher-paying job in different industry (NAICS two-digit) in Column (4); and dollar value of income in Column (5). $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county $\times$ event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Dependent Var	Mobility	Job Change	Moving to Different Industry	Moving to Higher Paying Industry	Income ($)
	(1)	(2)	(3)	(4)	(5)
$DebtRelief \times Post$	0.005***	0.004**	0.003**	0.01**	79.72***
	(0.001)	(0.002)	(0.001)	(0.004)	(31.330)
Individual FE	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes
Observations	6,010,381	967,411	967,219	245,114	471,547
R2	0.31	0.19	0.17	0.34	0.57

Table 9: Student Debt Relief and New Car Purchase

This table reports results from difference-in-differences regressions of durable consumption based on borrower-month panel data. The dependent variable is the indicator variable for purchasing a new car. $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county $\times$ event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Dependent Var	New Car Purchase Indicator (1)
$DebtRelief \times Post$	0.003*
	(0.0017)
Individual FE	Yes
County x Event-Month FE	Yes
Observations	6,010,381
R2	0.21

Table 10: Student Debt Relief and Borrower Outcomes: Controlling for Credit Score Changes

This table reports results from difference-in-differences regressions of consumer debt, delinquency, mobility and income outcomes based on borrower-month panel data controlling for credit score changes. The dependent variables are total debt balance excluding student loans in Column (1); balance of mortgage accounts in Column (2); revolving utilization in Column (3); number of all delinquent accounts excluding student loans in Column (4); mobility based on moving to a different ZIP code in Column (5); and dollar value of income in Column (6). $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects, county × event-month and credit score decile × event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
$DebtRelief \times Post$	-5,004.19***	-905.45***	-0.02***	-0.14***	0.01***	80.33***
	(650.270)	(163.890)	(0.004)	(0.020)	(0.001)	(31.230)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Credit Score Decile x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,010,381	6,010,381	6,010,381	6,010,381	6,010,381	471,547
R2	0.16	0.8	0.63	0.74	0.31	0.57

Table 11: Student Debt Relief and Borrower Outcomes: Heterogeneity by Debt Relief Amount

This table reports results from difference-in-differences regressions of consumer debt, delinquency, mobility and income outcomes based on borrower-month panel data for sub-samples split by above (Panel A) and below (Panel B) median levels of debt relief amount. The dependent variables are total debt balance excluding student loans in Column (1); balance of mortgage accounts in Column (2); revolving utilization in Column (3); number of all delinquent accounts excluding student loans in Column (4); mobility based on moving to a different ZIP code in Column (5); and dollar value of income in Column (6). $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Panel A: Above Median Debt Relief Amount

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
$DebtRelief \times Post$	-5,411.08***	-927.49***	-0.02***	-0.11***	0.005***	74.15***
	(1196.62)	(262.87)	(0.01)	(0.03)	(0.00)	(31.47)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,088,346	3,088,346	3,088,346	3,088,346	3,088,346	244,430
R2	0.11	0.8	0.63	0.73	0.33	0.6

Panel B: Below Median Debt Relief Amount

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
$DebtRelief \times Post$	-2,175.03***	-488.93**	-0.01	-0.05	0.003	31.01
	(676.360)	(237.990)	(0.010)	(0.030)	(0.002)	(50.820)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,537,229	2,537,229	2,537,229	2,537,229	2,537,229	193,345
R2	0.78	0.81	0.63	0.73	0.31	0.6

Table 12: Student Debt Relief and Borrower Outcomes: Heterogeneity by Age and Total Debt

This table reports results from triple differences regressions of consumer debt strategies based on borrower-month panel data. Compared to previous tables, we include the triple interactions to account for the heterogeneity in borrower characteristics. In both panels, the dependent variables are total debt balance excluding student loans in Column (1); balance of mortgage accounts in Column (2); revolving utilization in Column (3); number of all delinquent accounts excluding student loans in Column (4); mobility based on moving to a different ZIP code in Column (5); and dollar value of income in Column (6). In Panel A, we include the triple interaction $DebtRelief \times AboveMedianAge \times Post$. In Panel B, we include the triple interaction $DebtRelief \times AboveMedianTotalDebt \times Post$. $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual and county × event-month fixed effects in all columns. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Panel A: Heterogeneity by Age

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
$DebtRelief \times Above \times Post$	-4,581.88***	-667.02**	0.001	-0.10**	0.005**	-4.81
	(1405.63)	(312.89)	(0.01)	(0.04)	(0.003)	(57.56)
$DebtRelief \times Post$	-2,030.71***	-387.95**	-0.02**	-0.03	0.004**	86.37**
	(752.06)	(158.78)	(0.01)	(0.03)	(0.002)	(41.93)
$Above \times Post$	-3,859.05***	-1,205.90***	0.001	-0.22***	-0.01***	-23.52*
	(436.37)	(98.80)	(0.00)	(0.01)	(0.001)	(12.15)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,010,381	6,010,381	6,010,381	6,010,381	6,010,381	462,048
R2	0.15	0.79	0.61	0.72	0.4	0.57

Panel B: Heterogeneity by Total Debt Balances (Excluding Student Loans)

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
$DebtRelief \times Above \times Post$	-7,014.14***	-1,131.14***	-0.01	-0.10**	0.005**	73.63*
	(1217.40)	(293.39)	(0.01)	(0.04)	(0.003)	(38.70)
$DebtRelief \times Post$	-389.39	-52.62	-0.003	-0.05***	0.01**	25.71
	(405.75)	(149.60)	(0.01)	(0.02)	(0.002)	(38.46)
$Above \times Post$	-4,017.78***	-981.70***	-0.10***	-0.34***	-0.001	8.68
	(337.18)	(88.17)	(0.00)	(0.01)	(0.001)	(11.31)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,010,381	6,010,381	6,010,381	6,010,381	6,010,381	462,069
R2	0.15	0.79	0.62	0.72	0.4	0.57

Table 13: Robustness: Exploiting Variation in Timing of Treatment

This table reports results from difference-in-differences regressions of consumer debt, delinquency, mobility and income outcomes based on borrower-month panel data for sub-sample of treated individuals that exploit variation in timing of treatment. The dependent variables are total debt balance excluding student loans in Column (1); balance of mortgage accounts in Column (2); revolving utilization in Column (3); number of all delinquent accounts excluding student loans in Column (4); mobility based on moving to a different ZIP code in Column (5); and dollar value of income in Column (6). $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
$DebtRelief \times Post$	-2,238.72***	-361.26*	-0.01**	-0.15***	0.004**	73.68***
	(613.290)	(188.200)	(0.005)	(0.020)	(0.002)	(30.66)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	438,117	438,117	438,117	438,117	438,117	40,113
R2	0.84	0.86	0.72	0.78	0.46	0.46

Second Chance: Life without Student Debt

Online Appendix

Figure OA.1. Dynamics of the Total Debt Balances

The figure plots the dynamic coefficients corresponding to relative monthly dummies estimated separately for the treated and control groups. Relative monthly dummies are defined as the interval, in months, from the debt discharge date to credit report date. Blue (Red) color represents the treated (control) group. Dependent variable is total debt balance. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level.

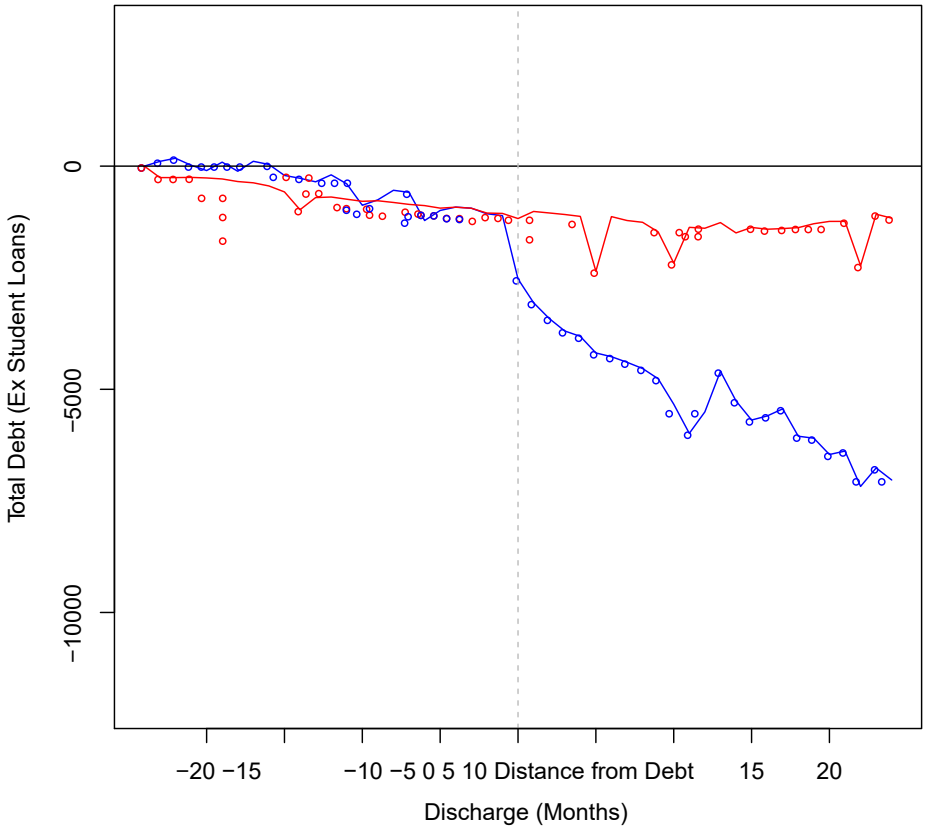


Figure OA.2. Dynamics of the Revolving Utilization

The figure plots the dynamic coefficients corresponding to relative monthly dummies estimated separately for the treated and control groups. Relative monthly dummies are defined as the interval, in months, from the debt discharge date to credit report date. Blue (Red) color represents the treated (control) group. Dependent variable is revolving utilization, calculated as ratio of revolving balance to revolving credit limit. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level.

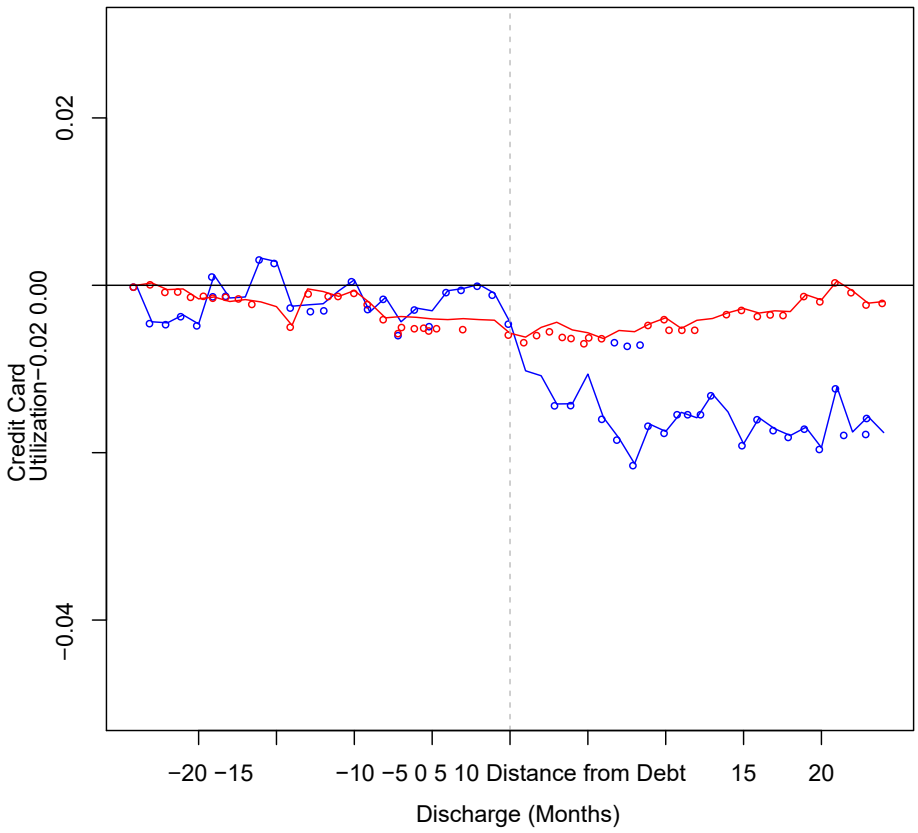


Figure OA.3. Dynamics of Delinquency Rate

The figure plots the dynamic coefficients corresponding to relative monthly dummies estimated separately for the treated and control groups. Relative monthly dummies are defined as the interval, in months, from the debt discharge date to credit report date. Blue (Red) color represents the treated (control) group. Dependent variable is the indicator of borrower having any delinquent account. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level.

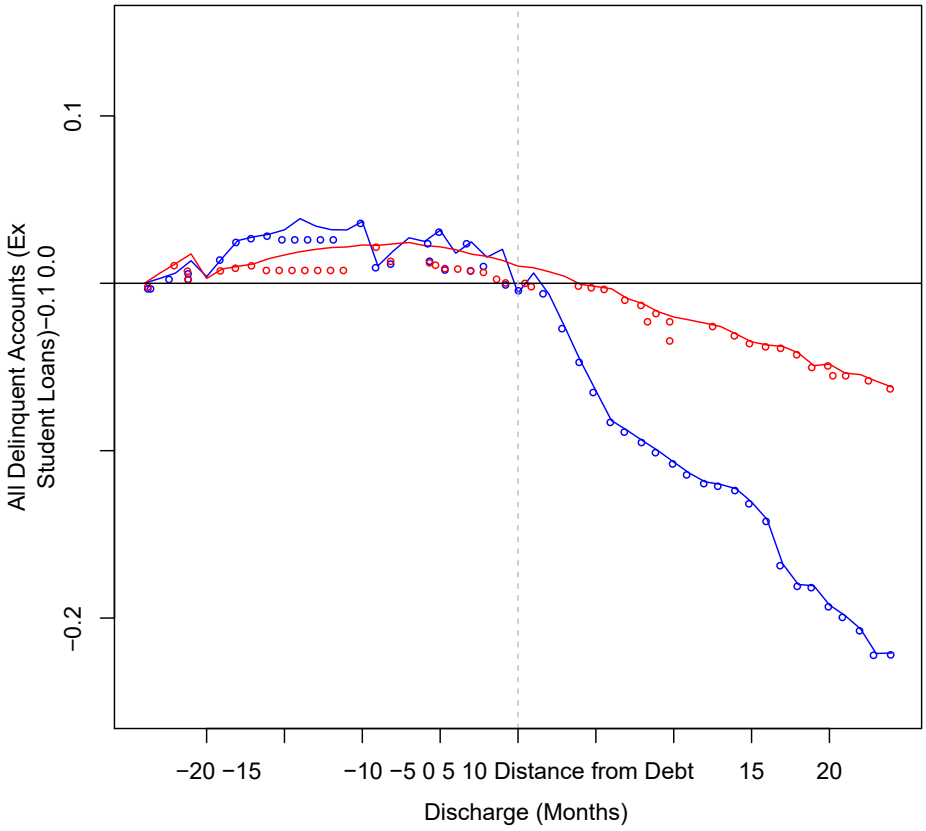


Figure OA.4. Dynamics of Income

The figure plots the dynamic coefficients corresponding to relative monthly dummies estimated separately for the treated and control groups. Relative monthly dummies are defined as the interval, in months, from the debt discharge date to credit report date. Blue (Red) color represents the treated (control) group. Dependent variable is the indicator of borrower moving from one address to another month to month. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level.

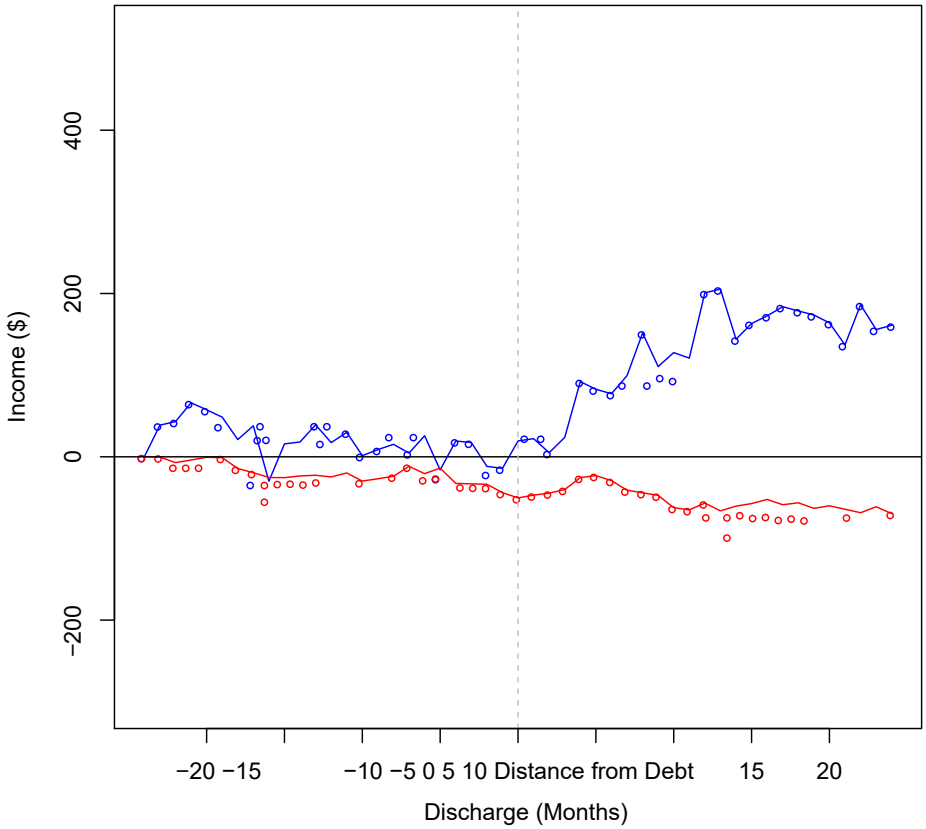


Table OA.1: Student Debt Relief and Borrower Outcomes: Including Calendar Month Fixed Effects

This table reports results from difference-in-differences regressions of consumer debt, delinquency, mobility and income outcomes based on borrower-month panel data. The dependent variables are total debt balance excluding student loans in Column (1); balance of mortgage accounts in Column (2); revolving utilization in Column (3); number of all delinquent accounts excluding student loans in Column (4); mobility based on moving to a different ZIP code in Column (5); and dollar value of income in Column (6). $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects, calendar month and county × event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
$DebtRelief \times Post$	-4,962.88***	-898.06***	-0.02***	-0.11***	0.004***	77.21***
	(651.970)	(163.510)	(0.004)	(0.020)	(0.001)	(31.010)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,010,381	6,010,381	6,010,381	6,010,381	6,010,381	471,547
R2	0.16	0.8	0.63	0.74	0.31	0.77

Table OA.2: Student Debt Relief and Borrower Outcomes: Double Clustering by Zipcode and Month

This table reports results from difference-in-differences regressions of consumer debt, delinquency, mobility and income outcomes based on borrower-month panel data. The dependent variables are total debt balance excluding student loans in Column (1); balance of mortgage accounts in Column (2); revolving utilization in Column (3); number of all delinquent accounts excluding student loans in Column (4); mobility based on moving to a different ZIP code in Column (5); and dollar value of income in Column (6). $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code and calendar-month level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
$DebtRelief \times Post$	-4,903.21***	-888.24***	-0.02***	-0.11***	0.005***	79.72**
	(656.560)	(162.670)	(0.004)	(0.020)	(0.001)	(35.760)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,010,381	6,010,381	6,010,381	6,010,381	6,010,381	471,547
R2	0.16	0.8	0.62	0.74	0.31	0.57

Table OA.3: Student Debt Relief and Borrower Outcomes: Balanced Panel (One year around treatment)

This table reports results from difference-in-differences regressions of consumer debt, delinquency, mobility and income outcomes based on borrower-month panel data for a balanced panel with one year around treatment. The dependent variables are total debt balance excluding student loans in Column (1); balance of mortgage accounts in Column (2); revolving utilization in Column (3); number of all delinquent accounts excluding student loans in Column (4); mobility based on moving to a different ZIP code in Column (5); and dollar value of income in Column (6). $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 12 months after the debt relief and 0 for 12 months before the debt relief. On the right hand side, we control for individual fixed effects and county $\times$ event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
$DebtRelief \times Post$	-2,711.16***	-549.53***	-0.01***	-0.11***	0.005***	62.33*
	(465.790)	(134.320)	(0.004)	(0.020)	(0.001)	(36.230)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,066,903	2,066,903	2,066,903	2,066,903	2,066,903	164,957
R2	0.89	0.9	0.78	0.89	0.36	0.59

Table OA.4: Student Debt Relief and Borrower Outcomes: Sub-sample with Employment Data

This table reports results from difference-in-differences regressions of consumer debt, delinquency, mobility and income outcomes based on borrower-month panel data for a sub-sample of individuals included in our employment data. The dependent variables are total debt balance excluding student loans in Column (1); balance of mortgage accounts in Column (2); revolving utilization in Column (3); number of all delinquent accounts excluding student loans in Column (4); mobility based on moving to a different ZIP code in Column (5); and dollar value of income in Column (6). *DebtRelief* is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. *Post* is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county $\times$ event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
$DebtRelief \times Post$	-5,284.85**	-648.66***	-0.01**	-0.13**	0.005**	73.22**
	(2435.370)	(145.030)	(0.005)	(0.060)	(0.002)	(31.330)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	471,547	471,547	471,547	471,547	471,547	471,547
R2	0.82	0.86	0.74	0.84	0.43	0.57

Table OA.5: Student Debt Relief and Borrower Outcomes: Heterogeneity by Wage Garnishment Laws

This table reports results from difference-in-differences regressions of consumer debt, delinquency, mobility and income outcomes based on borrower-month panel data for sub-samples with different levels of wage garnishment restrictions at the states of residences. Panel A represents states with highest level of restrictions while Panel B and C represent medium and lowest levels of restrictions. The dependent variables are total debt balance excluding student loans in Column (1); balance of mortgage accounts in Column (2); revolving utilization in Column (3); number of all delinquent accounts excluding student loans in Column (4); mobility based on moving to a different ZIP code in Column (5); and dollar value of income in Column (6). *DebtRelief* is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. *Post* is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Panel A: Severe Restrictions

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
DebtRelief × *Post*	-5,878.17***	-1,181.85***	-0.01**	-0.13***	0.004*	75.59**
	(1,012.32)	(301.21)	(0.005)	(0.04)	(0.002)	(36.77)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,150,286	2,150,286	2,150,286	2,150,286	2,150,286	186,582
R2	0.76	0.81	0.62	0.75	0.29	0.54

Panel B: Medium Restrictions

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
DebtRelief × *Post*	-4,893.87***	-1,257.63***	-0.03***	-0.14***	0.002	54.73
	(1248.37)	(363.93)	(0.01)	(0.04)	(0.002)	(71.68)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,409,491	1,409,491	1,409,491	1,409,491	1,409,491	99,083
R2	0.81	0.82	0.64	0.75	0.33	0.59

Panel C: No Restrictions

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
DebtRelief × *Post*	-4,794.20***	-738.77***	-0.01**	-0.12***	0.01***	79.97**
	(1181.54)	(235.93)	(0.005)	(0.03)	(0.002)	(39.89)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,507,452	2,507,452	2,507,452	2,507,452	2,507,452	185,882
R2	0.82	0.80	0.64	0.75	0.34	0.58

Table OA.6: Student Debt Relief and Borrower Outcomes: Heterogeneity by Timing of Debt Relief

This table reports results from difference-in-differences regressions of consumer debt, delinquency, mobility and income outcomes based on borrower-month panel data for sub-samples of borrowers whose debt got discharged during the first (Panel A) and second (Panel B) halves of the sample period. The dependent variables are total debt balance excluding student loans in Column (1); balance of mortgage accounts in Column (2); revolving utilization in Column (3); number of all delinquent accounts excluding student loans in Column (4); mobility based on moving to a different ZIP code in Column (5); and dollar value of income in Column (6). *DebtRelief* is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. *Post* is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Panel A: Debt Discharged between 2010 and 2013

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
DebtRelief × *Post*	-5,361.23***	-1,083.78***	-0.02***	-0.11***	0.004***	80.04**
	(1162.53)	(303.92)	(0.008)	(0.030)	(0.002)	(40.1)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,642,024	2,642,024	2,642,024	2,642,024	2,642,024	198,325
R2	0.80	0.82	0.65	0.78	0.34	0.62

Panel B: Debt Discharged between 2014 and 2017

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
DebtRelief × *Post*	-4,825.93***	-664.86***	-0.01**	-0.11**	0.01***	79.72**
	(802.55)	(195.12)	(0.005)	(0.03)	(0.001)	(39.90)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,425,205	3,425,205	3,425,205	3,425,205	3,425,205	273,222
R2	0.82	0.80	0.62	0.71	0.31	0.59

Table OA.7: Student Debt Relief and Borrower Outcomes: Robustness Matched Sample

This table reports results from difference-in-differences regressions of consumer debt, delinquency, mobility and income outcomes based on borrower-month panel data for a robustness matched sample constructed using propensity score method. The dependent variables are total debt balance excluding student loans in Column (1); balance of mortgage accounts in Column (2); revolving utilization in Column (3); number of all delinquent accounts excluding student loans in Column (4); mobility based on moving to a different ZIP code in Column (5); and dollar value of income in Column (6). $DebtRelief$ is defined as 1 for the delinquent student loans who received debt relief and 0 otherwise. $Post$ is defined as 1 for 36 months after the debt relief and 0 for 36 months before the debt relief. On the right hand side, we control for individual fixed effects and county × event-month fixed effects. Standard errors are clustered at ZIP Code level. Asterisks denote significance levels (***=1%, **=5%, *=10%).

Dependent Var	Total Debt Balance (Ex. Stud)	Mortgage Balance	Credit Card Utilization	All DLQ Accounts (Ex. Stud)	Mobility	Income ($)
	(1)	(2)	(3)	(4)	(5)	(6)
$DebtRelief \times Post$	-3,796.22***	-726.25**	-0.006	-0.12**	0.01***	76.67*
	(1244.52)	(368.62)	(0.005)	(0.037)	(0.002)	(41.33)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Event-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	986,600	986,600	986,600	986,600	986,600	91,603
R2	0.81	0.83	0.66	0.76	0.46	0.68