Relief Beliefs:

Effects of Anticipated Student Loan Forgiveness

Danial Salman Xuan Xie*

28th August, 2026

Abstract

We study how households adjust consumption to news about future liabilities. Our setting is President Biden's August 2022 student loan forgiveness announcement, which promised $10,000 to $20,000 in debt relief to approximately 42 million borrowers. Because the announcement occurred during the student loan payment moratorium, it created an uncertain expected wealth shock without contemporaneously changing required payments. We link administrative data on debt relief eligibility and applications to high-frequency retail scanner data. We find that stores located in counties with a 1 percentage point higher share of eligible borrowers experienced a persistent 0.1% increase in weekly sales following the announcement. This response was absent in counties with high pre-announcement delinquency rates, consistent with delinquent borrowers being liquidity constrained and unable to smooth consumption. Sales subsequently declined in more-exposed counties when the Supreme Court blocked the plan. Together with widespread debt relief applications, the spending responses show that beliefs about ultimately unrealized debt relief affected households' behavior.

*For helpful comments, we thank Léa Stern, Jarrad Harford, Jordan Nickerson, Stephan Siegel, Philip Bond, Rawley Heimer, Felix Dornseifer, Clemens Sialm, Constantine Yannelis, Ahmed Guecioueur, Kourosh Ghobadi, Yvonne Ng, and seminar and conference participants at the NBER Economics of Education, the American Finance Association, the SAFE Household Finance Workshop, the Financial Management Association, the Southern Finance Association, and the Inter-Finance PhD Seminar. Danial Salman is with Vanderbilt University (Email: danial.salman@vanderbilt.edu), and Xuan Xie is with the City University of Hong Kong xuanxie@cityu.edu.hk). All errors are our own.

Researchers' own analyses calculated (or derived) based in part on data from Nielsen Consumer LLC and marketing databases provided through the NielsenIQ Datasets at the Kilts Center for Marketing Data Center at The University of Chicago Booth School of Business. The conclusions drawn from the NielsenIQ data are those of the researchers and do not reflect the views of NielsenIQ. NielsenIQ is not responsible for, had no role in, and was not involved in analyzing and preparing the results reported herein.

The authors declare that they have no relevant or material financial interests that relate to the research described in this paper.

Expectations about future income and liabilities are essential inputs to canonical models of consumption, saving, and portfolio choice. Empirically, however, isolating their effects is difficult because news about future resources often coincides with contemporaneous changes in income, liquidity, employment, or asset values. While a small but growing literature uses survey-based approaches to study the link between expectations and behavior (Fuster and Zafar, 2023), direct evidence on how households adjust spending when they receive news about future changes in income or liabilities remains relatively limited (Fuster, Kaplan and Zafar, 2021; Colarieti, Mei and Stantcheva, 2024).

In this paper, we leverage a setting that offers an unusual opportunity to address the empirical challenge. We evaluate the immediate consumption response to President Biden's August 2022 student loan forgiveness announcement, which promised debt relief of $10,000 to $20,000 for approximately 42 million borrowers. The announcement conveyed news of a meaningful but uncertain wealth shock of 10-20% of median household wealth (Dinerstein, Yannelis and Chen, 2024). Because the announcement occurred during the pandemic-era student loan payment moratorium, the proposed balance reduction was not accompanied by a concurrent change in cash flows. This feature distinguishes our setting from other debt-relief interventions, such as consumer bankruptcy, in which balance reductions typically coincide with reductions in required payments. Furthermore, unlike other wealth shocks—such as fluctuations in housing or stock market wealth, which may have both permanent and transitory components—student loan forgiveness is entirely permanent, simplifying its interpretation (Dinerstein et al., 2025).

In theory, rational consumers would immediately incorporate news about changes in their permanent income. However, if many student loan borrowers were liquidity constrained or hand-to-mouth, they would have been unable to smooth consumption from the wealth shock. Moreover, given the legal challenges to the policy, many borrowers may have assigned a low subjective probability to receiving a reduction in their student debt balances. The Supreme Court eventually blocked the debt relief plan in June 2023.

Using an exposure research design, exploiting the geographical variation of student loan borrowers, we show that retail stores located in counties with a 1 percentage point higher share of student loan borrowers, who were eligible for debt relief, saw a persistent 0.1% increase in weekly sales following the announcement. We find that the spending response was absent in counties with high shares of financially delinquent households. Our results indicate that student loan borrowers, who were not liquidity constrained, increased spending immediately upon receiving news about an

upcoming, large principal reduction.

The estimated spending response implies a quarterly marginal propensity to consume (MPC) of 2.3% if borrowers expected to receive the full statutory amount of debt relief with certainty. Because the policy faced substantial legal uncertainty, this benchmark likely overstates the perceived wealth gain and therefore understates the MPC out of expected wealth. Using survey evidence that 47% of borrowers expected some debt cancellation within a year, we obtain a belief-adjusted MPC of 4.8% (Koustas, Weber and Yannelis, 2026). These estimates are comparable to but somewhat larger than typical estimates in the literature for MPCs derived from increases in illiquid wealth (Kaplan and Violante, 2022). The relatively large MPC in our setting may reflect differences between reductions in liabilities and increases in asset values or a particular aversion to student debt (Baugh et al., 2021; Gopalan et al., 2024).

To study the effects of student loan forgiveness, we obtained comprehensive data on the number of borrowers eligible for debt relief and their subsequent applications from the Department of Education via Freedom of Information Act (FOIA) requests. We combined this zip code-level dataset with retail scanner data from NielsenIQ to compute each store's differential exposure to President Biden's loan forgiveness announcement. The high-frequency and granular nature of the scanner data allows us to control for location-specific economic trends by employing high-dimensional fixed effects. Effectively, we compare stores belonging to the same chain located in the same media market at the same time but in different counties with varying levels of exposure to eligible student loan borrowers. Moreover, given the granularity of the scanner data, we document heterogeneous effects across broad product categories, showing positive treatment effects among a wide variety of goods.

Since debt relief eligibility may correlate with unobservable differences between individuals that independently affect spending behavior, we conduct placebo tests using counterfactual debt relief announcements. We do not find statistically significant differential spending responses among retail stores more exposed to eligible borrowers following placebo announcements in the same calendar week of different years. These results suggest that the August 2022 announcement was a pivotal event that shifted borrowers' spending behavior.

Next, we evaluate the immediate consumption response to the Supreme Court decision striking down the Biden administration's debt relief plan in June 2023. In contrast to the previous policy announcement, the Court's decision represented a negative shock to borrowers' net worth, attenuated by the degree to which borrowers expected the Supreme Court justices to rule the plan unconsti-

tutional. We find evidence that borrowers reduced spending immediately following the Supreme Court reversal. The opposing spending reactions to the announcement and reversal at the same exposed stores make it difficult to reconcile our findings with an alternative explanation relying on a fixed, unobserved difference between counties with high and low numbers of eligible borrowers.

Our results align with a beliefs channel. If borrowers did not expect to eventually receive loan forgiveness—perhaps because they accurately anticipated the Supreme Court's decision—they would not have reacted to the plan's announcement or reversal, nor would they have submitted debt relief applications. However, we find that application counts strongly correlate with student loan forgiveness eligibility. We also show that debt relief take-up rates were higher among women, high-income households, and in zip codes that lean more toward the Democratic Party.

We further document the consequences of the broader period of heightened uncertainty and student loan policy changes in terms of delinquency rates. Three years after the initial debt relief announcement, we find that counties with greater exposure to eligible borrowers had higher shares of residents with a credit bureau record with any debt in collections. While many of the borrowers slated for debt relief likely anticipated receiving forgiveness, ultimately, it did not arrive. We observe increased delinquencies beginning in August 2023, before the payment pause ended, but especially by the summer of 2025, once non-payment of student debt would have been reported to the credit bureaus.

Our results are robust to using an alternative measure of student loan borrowers. Using representative credit bureau data, we define stores' exposure based on all borrowers with outstanding student loan debt, rather than only those eligible for relief, and obtain similar point estimates. Our findings are also robust to restricting the scanner data to stores that report sales consistently each week. Finally, we address potential confounding from the Inflation Reduction Act, enacted eight days before the debt relief announcement, by controlling flexibly for county exposure to its health care and consumer energy provisions. These additional controls leave our main results essentially unchanged.

We show that consumer spending is responsive to news and to beliefs about future household balance sheets. In this regard, our work is similar to Garmaise, Levi and Lustig (2024), who demonstrate that household consumption displays excess sensitivity to macroeconomic news, and to Chopra, Roth and Wohlfart (2025), who show that experimentally induced changes in home-price expectations affect household spending. Focusing on political news about household liabilities instead, we document that presidential announcements can shift households' behavior even amid

legal uncertainty surrounding forthcoming executive and judicial actions. By tracking how spending evolves around both the initial loan forgiveness announcement and the Supreme Court decision, our findings also contribute to the broader literature on economic policy uncertainty and underscore the role of policymakers in shaping expectations (Baker, Bloom and Davis, 2016).

More directly, our findings contribute to the growing literature on student loans.[1] Closely related to our paper, Dinerstein, Yannelis and Chen (2024) study the student loan payment moratorium and Biden's debt relief announcement, finding effects on credit outcomes during the moratorium but not on borrowers' credit use around the forgiveness announcement. Relative to that paper, our focus is on retail spending rather than debt-financed consumption. More recently, Dinerstein et al. (2025) examine realized federal student loan discharge, while Di Maggio, Kalda and Yao (2026) study realized private student debt discharge. Relative to this work, we isolate the immediate spending response to a broad, salient, but ultimately unrealized forgiveness announcement.

In contemporaneous work, Koustas, Weber and Yannelis (2026) elicit borrower beliefs about student loan forgiveness and link those beliefs to credit bureau and consumption data. Their main focus is on student loan repayment activity, and they show that the August 2022 announcement substantially increased expected forgiveness and that more optimistic borrowers reduced voluntary student loan payments. They also document some evidence that optimism about forgiveness was associated with higher nondurable spending. Our analysis is complementary: rather than directly measuring individual beliefs, we use administrative data on the universe of eligible borrowers and debt relief applications, linked to high-frequency retail scanner data, to estimate consumption responses to the announcement and its reversal across local markets.[2]

Finally, we add to a literature examining the effects of debt relief interventions. There is an ongoing debate about the merits of balance reduction policies relative to those providing liquidity relief. For instance, Ganong and Noel (2020) document that short-term payment reductions with no change in long-term obligations have significant effects while principal reductions without changes in payments have no effect. Indarte (2023) finds similar evidence for liquidity effects being stronger in consumer bankruptcy filings. Dobbie and Song (2020) find the opposite in terms of positive effects for interest write-downs but not for immediate payment reductions. Cespedes, Parra and Sialm (2026) argue that large principal reductions on mortgage loans have substantial effects even in

[1] See Yannelis and Tracey (2022) and Looney and Yannelis (2024) for recent overviews.

[2] An advantage of the Department of Education data is that they capture all borrowers deemed eligible for relief, including relatively young cohorts who may have been especially exposed to the proposed cancellation. The Department estimated that 65% of eligible borrowers were under age 40 (White House, 2022).

the short run. We contribute to this literature by showing that balance reductions have non-trivial effects for households that are not liquidity constrained. Relative to the aforementioned papers, our results pertain to government debt relief interventions for which there is a paucity of evidence.

The remainder of this paper is structured as follows. In Section I, we discuss the student loan market and the debt relief plan. Section II describes the data that we use in our analysis. Section III presents our empirical strategy and the main findings. Finally, Section IV concludes.

I Institutional Background

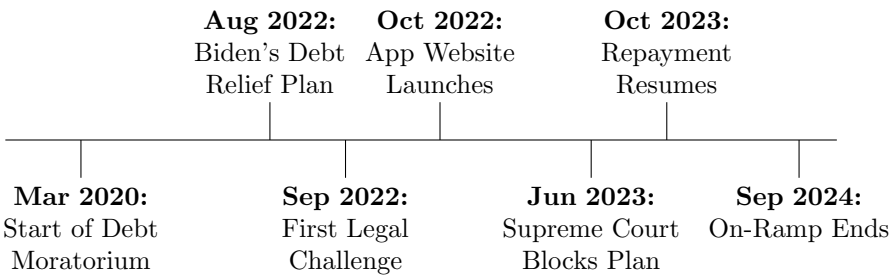
The student loan market has experienced tremendous growth over the past few decades. Looney and Yannelis (2024) document that since 2000 total debt balances have more than quadrupled and the number of borrowers has more than doubled. They show that as of 2023, approximately 46 million borrowers held $1.6 trillion in outstanding student loans which represents the largest source of household debt after mortgages. Federal student loans, that is, loans that are disbursed or guaranteed by the federal government, compose the vast majority of outstanding student loan debt. As of August 2023, the share of individuals with a credit bureau record who have any student loan debt is 15%; these borrowers have a median balance of $20,625 and a median payment of $166 (Urban Institute, 2024).

In recent years, several policy and legal changes have impacted the student loan market. We summarize these in Figure 1a. In this paper, we focus on President Biden's August 2022 loan forgiveness announcement which promised debt relief of $20,000 to borrowers who received a Pell Grant in college with loans held by the Department of Education and $10,000 in debt cancellation to non-Pell Grant recipients.

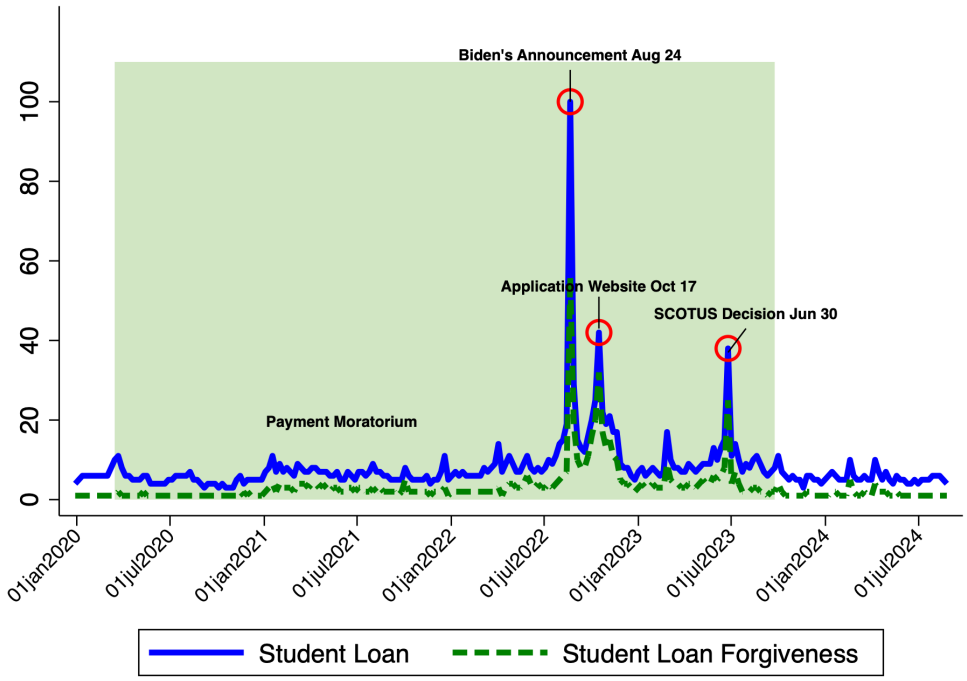
Eligibility under the program was based on 2020 or 2021 income: less than $125,000 for individuals and less than $250,000 for households.[3] As Pell Grant recipients formed more than 60% of the borrower population, the Department of Education estimated that around 27 million borrowers would be eligible for the full $20,000 in debt relief (White House, 2022). Moreover, the Department estimated that the president's policy would cancel the full remaining balance for roughly 20 million borrowers.

The announcement itself took place during the pandemic-era debt moratorium which froze required student loan payments. The Department of Education launched a website for processing debt

[3]Dependent student loan borrowers' eligibility was based on parental income.



(a) Timeline



(b) Google Trends

Figure 1: Student Loan Timeline and Search Intensity. Panel (a) plots key events affecting the student loan market between March 2020 and September 2024. Panel (b) plots weekly aggregate Google searches for 'student loan' and 'student loan forgiveness' from the week of December 29, 2019 through the week of August 25, 2024. Search counts are normalized on a scale from 0 to 100, where 100 represents maximum search interest. The green shaded area indicates the period of the student loan payment moratorium.

relief applications and began verifying individual borrowers' eligibility in October 2022. However, the plan faced immediate political opposition and legal challenges, culminating in the Supreme Court blocking the Biden-Harris Administration from implementing the debt relief measures. Student loan payments resumed in October 2023, and the Department of Education's 12-month "on-ramp" to re-

payment ended on September 30, 2024, after which missed payments once again became reportable to credit bureaus.

Although borrowers' liabilities were ultimately unaffected under the plan, we argue that the announcement itself is of independent interest given its scope and the attention it received at the time. Figure 1b presents normalized search volume from Google Trends for 'student loan' and 'student loan forgiveness'. Biden's announcement stands out as the most noteworthy event, with the latter two spikes occurring when the debt relief application website launched and when the Supreme Court blocked the plan. In contrast, the student loan payment moratorium of March 2020 barely registers despite borrowers having received immediate liquidity relief.

II Data

This section describes the data used in this paper. We construct our main dataset by aggregating the universe of eligible student loan borrowers to the county level and merging it with NielsenIQ's Retail Scanner data. Parts of the analysis use credit bureau data via the Urban Institute. We also construct demographic covariates from a variety of sources outlined below.

II.1 Department of Education

The U.S. Department of Education maintained zip code-level counts of eligible student loan borrowers under the proposed Biden-Harris debt relief plan, which we obtained through a Freedom of Information Act (FOIA) request. These counts are rounded, and zip codes with fewer than 10 borrowers are excluded. In total, the data represent about 42 million borrowers, 99% of whom are associated with specific zip codes. The Department did not include data on Pell Grant recipients in its analysis of eligible borrowers. Therefore, we cannot distinguish between those eligible for $10,000 or $20,000 in debt forgiveness at the zip code level.

The Department of Education launched a website on October 14$^{\text{th}}$, 2022 and received approximately 25 million debt relief applications until the website closed down under legal pressure on November 11$^{\text{th}}$, 2022.[4] By this time, the Department had approved two-thirds of the applications, sending them to loan servicers for further processing. From a second FOIA request, we obtained zip code-level counts of the debt relief applications where zip codes with fewer than 100 borrowers

[4]Borrowers submitted a short online application on https://studentaid.gov/debt-relief/application, by inputting their names, contact information, and Social Security Numbers and by affirming that they satisfied the plan's income eligibility thresholds.

are excluded. We observe all 25 million applications, 94% of whom are associated with specific zip codes.

The choropleth maps in Figure 2 plot eligible borrowers (Figure 2a) and debt relief applications (Figure 2b) as a share of the total adult population in each county. The maps convey a high degree of cross-sectional variation. In particular, counties in the South, Appalachia, and parts of the Midwest tend to have high shares of eligible student loan borrowers and applicants. In contrast, much of the Western United States and certain parts of the Northeast exhibit lower shares. Importantly, there is substantial within-state variation in the shares.

II.2 Retail Scanner

We measure weekly consumer spending using the NielsenIQ Retail Scanner dataset.[5] It captures a substantial part of retail consumption in the United States and has been used extensively in the economics and marketing literatures with growing use in finance (Dubois, Griffith and O'Connell, 2022).

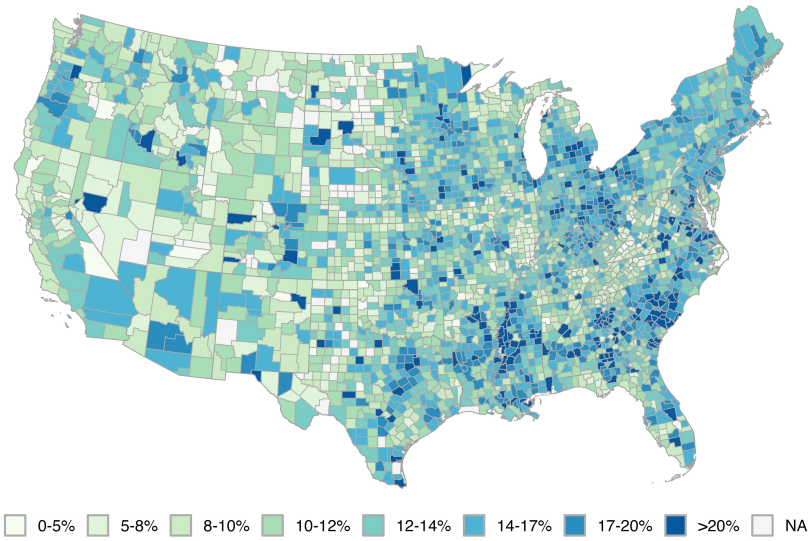
The scanner data are at the store level. We observe more than 50,000 de-identified retail stores in various categories (food, drug, mass merchandiser, convenience, and liquor) with collective sales of greater than $500 billion in 2022. Appendix Table B.1 reports summary statistics on weekly spending in each retail channel. The dataset contains each store's county of location which we use to link to the counts of eligible student loan borrowers.

II.3 Credit Bureau

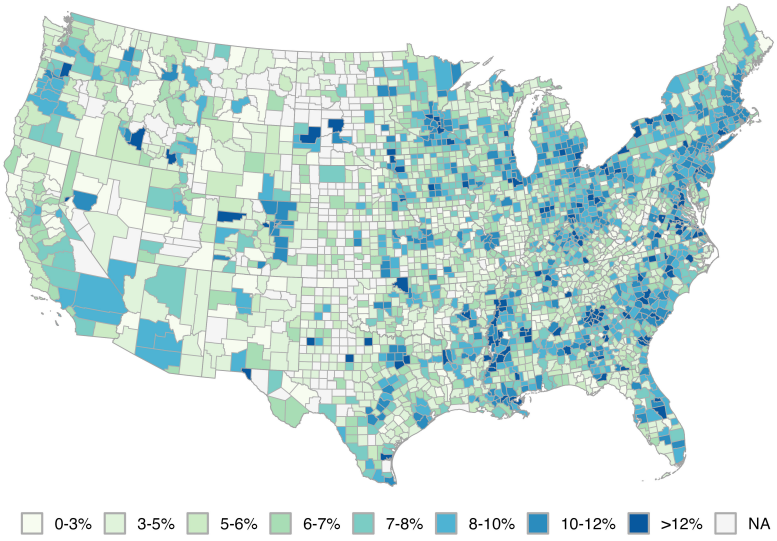
We source aggregated, representative data on household debt from the Urban Institute.[6] We primarily use a county-level snapshot from February 2022, 6 months before President Biden's debt relief announcement. In section III.7, we incorporate four additional county-level snapshots from 2018 to 2025.

In February 2022, the national share of people with a credit bureau record who have any student loan debt was 15% while their median balance was $20,108 and their median payment was $160. Approximately, one-quarter of individuals with a credit bureau record were financially delinquent in the sense that they had some debt (including student loans and other liabilities like mortgage and credit card debt) in collections (see Appendix A for more details).

[5]The data is provided by the Kilts Center at the University of Chicago Booth School of Business.
[6]The latest data can be obtained from https://apps.urban.org/features/debt-interactive-map/.



(a) Eligible Share



(b) Application Share

Figure 2: Distribution of Student Loan Forgiveness. This figure plots the county-level distribution of eligible borrowers and their debt relief applications. Panel (a) shows the share of adults in each county who were eligible for forgiveness under the plan. Panel (b) shows the number of applications as a share of total adults in each county. Darker colors correspond to higher shares.

II.4 Demographics

Finally, we supplement our FOIA data with demographic characteristics at the zip code and county level from the American Community Survey 5-Year estimates. We extract college enrollment data from the Integrated Postsecondary Education Data System (IPEDS). We also obtain partisanship information from the MIT Election Lab and the Federal Election Commission (FEC) to identify blue counties and individual campaign donations to the Democratic Party respectively during the 2020 election cycle.[7]

III Results

III.1 Consumer Spending

Leveraging geographical variation in eligibility for the debt relief program, we first study the effect of President Biden's loan forgiveness announcement on consumer spending by estimating the following equation:

$$Y_{ikt} = \beta_{DiD} \textit{Eligible Share}_k \times Post_t + \mu_i + \tau_t + \epsilon_{ikt}. \tag{1}$$

The outcome is ln(total sales) for store i in county k in week t. We define $\textit{Eligible Share}_k$ as the share of adults in county k who were eligible for forgiveness under the plan, while $Post_t$ is an indicator for whether a week falls around or after August 24, 2022, the date of the announcement. μ_i and τ_t are store and week fixed effects respectively. We cluster standard errors at the county level.

Eligible Shares are equilibrium objects; therefore, we cannot assume that they are uncorrelated with the levels of the outcome. However, identification rests on differential *changes* in store-level outcomes across counties with different levels of exposure. Because all counties were exposed to the announcement and treatment varies only in intensity, our design is a continuous treatment difference-in-differences. Under a standard parallel trends assumption, β_{DiD} captures the differential post-announcement change in log sales across stores facing different county-level exposure to eligible borrowers.[8]

[7] We follow and update Meeuwis et al. (2022) in creating our zip code-level partisanship measure.

[8] A stronger assumption, referred to as strong parallel trends, is required to interpret these cross-dose comparisons causally as a treatment effect of higher versus lower exposure, since treatment-effect heterogeneity across counties with different eligible shares may also contribute to the estimated coefficient (Callaway, Goodman-Bacon and Sant'Anna, 2024).

Given this identifying assumption, Table 1 presents the results of the exposure research design. Column (1) shows that retail stores located in counties with a 1 percentage point higher share of student loan borrowers eligible for debt relief experienced a 0.2% increase in total sales following the announcement. In column (2), we incorporate designated market area-week fixed effects, absorbing variation in local conditions. In column (3), we further include parent company and retail channel fixed effects, each interacted with week dummies. With these high-dimensional fixed effects, we are effectively comparing stores belonging to the same chain, located in the same media market, and observed in the same week, but operating in different counties with different levels of exposure to eligible student loan borrowers.[9] We find that these coefficients are similar to those in column (1).

In column (4), we introduce county-level demographic controls, each interacted with week fixed effects to allow their effects to vary over time. These include median household income, total population, and the under-18 and college enrollment shares of the population. The latter two measures alleviate concerns related to back-to-school spending which arguably coincides with the announcement. We also include a dummy for blue counties, those who gave Biden a majority of the vote in the 2020 presidential election, to distinguish our estimates from a partisan sentiment effect. Our preferred estimate therefore indicates that retail stores located in counties with a 1 percentage point higher share of eligible student loan borrowers experienced a 0.1% increase in weekly sales following the announcement.

Our results are robust to using an alternative measure of student loan borrowers. Defining retail stores' exposure instead to all borrowers holding any student loan debt based on representative credit bureau data, we reestimate equation 1 and find similar results. We recover an identical point estimate in column (1) of Appendix Table B.2 relative to that in our baseline table. With additional fixed effects, the point estimates are somewhat stronger using the broader measure of student loan borrowers, suggesting that more borrowers anticipated relief than were actually eligible for forgiveness [10]. Our results are also strongly robust to a more stringent cut of the scanner data, where we omit stores that do not report sales each week (Appendix Table B.3).

Next, we calculate the implied MPC from the spending response to place our findings in context of the broader literature on MPCs out of illiquid wealth, such as housing or stock market equity (Kaplan and Violante, 2022). We start with personal consumption expenditures on nondurable

[9]The NielsenIQ Retail Scanner data is anonymized, and we make no attempt to infer actual store names.

[10]The Department of Education initially advised borrowers with commercially held Federal Family Education Loan (FFEL) loans that they could qualify by consolidating them into Direct Loans, but revised its guidance on September 29, 2022. See Cory Turner, "In a Reversal, the Education Department Is Excluding Many from Student Loan Relief," *NPR*, `https://www.npr.org/2022/09/29/1125923528/biden-student-loans-debt-cancellation-ffel-perkins`.

	(1)	(2)	(3)	(4)
Eligible Share x Post	0.24***	0.22***	0.23***	0.10***
	(0.034)	(0.045)	(0.044)	(0.038)
Store FE	YES	YES	YES	YES
Week FE	YES	NO	NO	NO
Market-Week FE	NO	YES	YES	YES
Parent-Week FE	NO	NO	YES	YES
Channel-Week FE	NO	NO	YES	YES
Demographics-Week FE	NO	NO	NO	YES
R-squared	0.99	0.99	0.99	0.99
Observations	798240	798030	798015	798015

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 1: Spending at Retail Stores Post-Announcement. This table reports the results of regression 1. The data are at the store-week level and cover the weeks of July 10, 2022 to October 16, 2022. The outcome variable is $ln(sales)$. Eligible Share is the share of adults in a county who were eligible for loan forgiveness, and Post is an indicator for whether a week falls around or after August 24, 2022. The demographic controls include: median household income, total population, partisanship, under-18 and college enrollment shares of the population. Standard errors are clustered at the county level.

goods of $3.9 trillion and a U.S. adult resident population of 260.8 million in 2022.[11] Using the coefficient in column (4) of Table 1, we estimate the implied change in nondurable consumption per eligible borrower as $374 over a quarter. Given that the Department of Education estimated that roughly 27 million borrowers were Pell Grant recipients, eligible for the full $20,000 in loan forgiveness, we calculate an average statutory relief amount of $16,429 (White House, 2022). Therefore, normalizing the change in consumption by the change in wealth, our estimate of the average quarterly MPC is 2.3%.

Our MPC estimate, based on a reduction in a financial liability, is in the range of typical estimates in the literature that rely on appreciations in asset valuations. However, relaxing the assumption of certain debt relief increases the implied MPC out of expected wealth. A survey of beliefs about forgiveness finds that, following the announcement, 47% of borrowers expected to have some of their debt canceled within a year (Koustas, Weber and Yannelis, 2026). Using this estimate, the implied MPC is 4.8%. Similarly, borrowers having outstanding balances below the

[11] Personal consumption expenditures on nondurable goods are from the U.S. Bureau of Economic Analysis, National Income and Product Accounts, Table 2.3.5, accessed through FRED series PCND: https://fred.stlouisfed.org/series/PCND. The adult population is from the U.S. Census Bureau Population Estimates Program, *Estimates of the Total Resident Population and Resident Population Age 18 Years and Older for the United States, States, District of Columbia, and Puerto Rico: July 1, 2022*: https://www.census.gov/newsroom/press-kits/2022/2022-national-state-population-estimates.html.

statutory forgiveness amounts would reduce the effective wealth shock and therefore raise the implied MPC. Using the Congressional Budget Office's estimate of approximately $10,000 in canceled debt per borrower, the implied MPC is 3.7%.[12] To the extent that the implied MPC is higher than comparable estimates in the literature, this could reflect a behavioral response to liability reductions (Baugh et al., 2021), a particular aversion to student debt (Gopalan et al., 2024), or differences in underlying populations.

In Table 2, we show that the post-announcement spending response is stronger in counties with higher eligible share exposure. Relative to the lowest-exposure counties, stores in counties in the top half of the eligible share distribution saw meaningfully larger post-announcement sales increases. Column (4) reports that stores in the third and fourth quartiles of county eligibility exposure experience 1.2–1.4% larger post-announcement sales increases relative to the lowest quartile. By contrast, the estimate for the second quartile is smaller and statistically insignificant, suggesting that the relationship is nonlinear and that the spending response is concentrated in the upper half of the exposure distribution.

III.2 Dynamics of Consumer Spending

To get a better sense of how average treatment effects evolve over time, we employ a dynamic difference-in-differences methodology within the following event study specification:

$$Y_{ikt} = \mu_i + \sum_{t=1}^{T} \beta_t \left(\text{Eligible Share}_k \times \text{week}_t\right) + \sum_{t=1}^{T} \delta_t' \left(X_i \times \text{week}_t\right) + \varepsilon_{ikt}. \tag{2}$$

Y_{ikt}, *Eligible Share*$_k$, and μ_i are defined as before. $X_i \times \text{week}_t$ reflects all of our fixed effects from the last specification in Table 1. We include data for the week of July 10 as $t = 0$, but omit a coefficient for this reference time period. Figure 3 shows that estimated treatment effects are near zero in the pre-period and that they are positive and statistically significant following the announcement, staying elevated around 0.1-0.2%.

Relative to estimates from July, the point estimates for the weeks of August 7 and August 14 suggest anticipation or policy leakage. A closer look at Google Trends in the days and weeks leading up to the announcement reveals clear spikes in search activity (Appendix Figure B.1). At the same time, news articles speculated about upcoming student debt relief, a key promise of President Biden's election campaign.[13] Notably, the spike in searches on August 16 coincides

[12] See https://www.cbo.gov/publication/58494.

[13] Ann Carrns, "What to Know as the Pause on Student Loans Is Set to Expire," *New York Times*, August 12,

	(1)	(2)	(3)	(4)
Eligible Share Q2 x Post	0.0064	0.0085	0.0096*	0.0051
	(0.0057)	(0.0052)	(0.0049)	(0.0052)
Eligible Share Q3 x Post	0.012***	0.015***	0.018***	0.012***
	(0.0042)	(0.0041)	(0.0039)	(0.0040)
Eligible Share Q4 x Post	0.023***	0.023***	0.026***	0.014***
	(0.0038)	(0.0044)	(0.0043)	(0.0047)
Store FE	YES	YES	YES	YES
Week FE	YES	NO	NO	NO
Market-Week FE	NO	YES	YES	YES
Parent-Week FE	NO	NO	YES	YES
Channel-Week FE	NO	NO	YES	YES
Demographics-Week FE	NO	NO	NO	YES
R-squared	0.993	0.993	0.993	0.993
Observations	799028	798818	798803	798803
Mean eligible share: Q1	0.097	0.097	0.097	0.097
Mean eligible share: Q2	0.128	0.128	0.128	0.128
Mean eligible share: Q3	0.153	0.153	0.153	0.153
Mean eligible share: Q4	0.197	0.197	0.197	0.197

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Spending at Retail Stores Post-Announcement by County Exposure Quartile. This table reports quartile-based difference-in-differences estimates of the effect of President Biden's August 24, 2022 student loan forgiveness announcement on retail sales. The data are at the store-week level and cover the weeks of July 10, 2022 to October 16, 2022. The outcome variable is ln(sales). Counties are assigned to quartiles based on their pre-announcement eligible share, defined as the share of adults in the county eligible for debt relief; quartile 1 (Q1) is omitted, so the coefficients on Eligible Share Q $q \times$ Post for $q \in \{2, 3, 4\}$ are interpreted relative to the lowest-exposure quartile. Post is an indicator for whether a week falls around or after August 24, 2022. Mean eligible shares for each quartile are reported at the bottom of the table. The demographic controls include median household income, total population, partisanship, and the under-18 and college-enrollment shares of the population. Standard errors are clustered at the county level.

with the Department of Education discharging debt for approximately 200 thousand students of ITT Technical Institute which may have signaled the much broader executive action we study that involved debt cancellation for over 42 million borrowers.[14]

Appendix Figure B.2 shows analogous event-study estimates by quartile of county eligible share exposure. The dynamic pattern is consistent with the static quartile results: post-announcement

2022.

[14]Stacy Cowley, "Education Department wipes out $4 billion in ITT Tech student loans," *New York Times*, August 16, 2022.

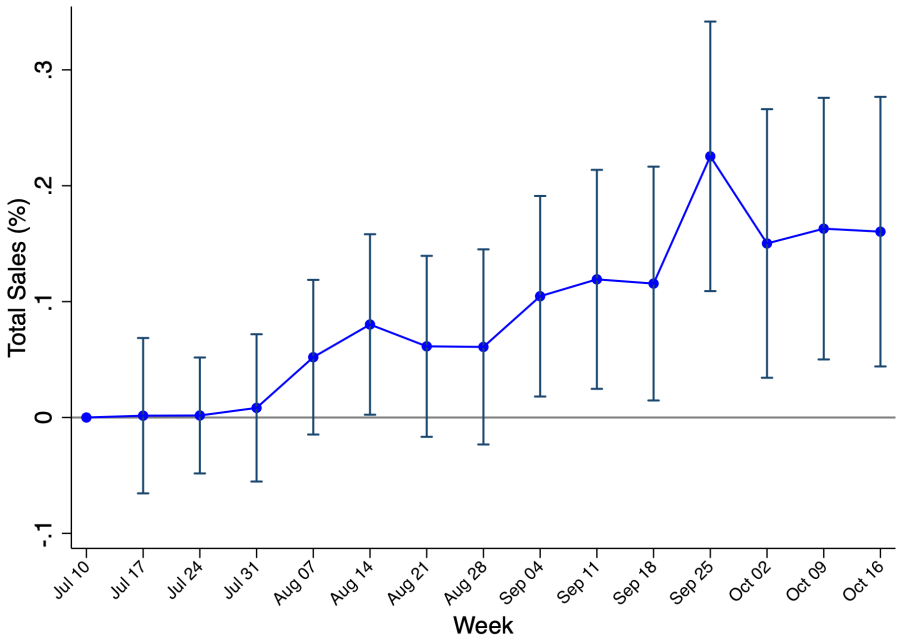


Figure 3: Dynamics of Spending Response. This figure reports estimated coefficients and 95% confidence intervals from regression 2. The data are at the store-week level and cover the weeks of July 10, 2022 to October 16, 2022. The specification includes fixed effects for the following groups, interacted with dummies for each week: designated market area, parent company, retail channel, median household income, total population, partisanship, under-18 and college enrollment shares of the population. Standard errors are clustered at the county level.

spending responses are concentrated in the upper half of the exposure distribution, while differences between the third and fourth quartiles are modest.

A concern with the previous tests is that eligibility may be correlated with unobservable differences between individuals that independently affect spending behavior following the announcement. For example, consumer types may not be uniformly distributed across counties even within a media market, with more urban counties having higher exposure to eligible borrowers and exhibiting different seasonal spending patterns. Indeed, while high and low exposure counties are similar along a number of dimensions, they also differ in terms of median household income, education, and partisanship (Appendix Table B.5).

To address this concern, we conduct placebo tests which convey differential spending responses to counterfactual debt relief announcements. We repeat the difference-in-differences methodology specified in equation 2, with the event window now reflecting announcements in the same calendar week but in different years. Appendix Figure B.3 presents analogous estimates to those in Figure 3. The placebo tests generally do not yield a similar pattern nor statistically significant estimates,

suggesting that the August 2022 announcement was a pivotal event that shifted borrowers' spending behavior.

However, contemporaneous policy shocks could still confound our estimates. In particular, the enactment of the Inflation Reduction Act (IRA) on August 16, 2022, raises the possibility that relief eligibility partly proxies for differential exposure to the Act. We measure IRA exposure through three principal household-facing provisions: enhanced Affordable Care Act premium tax credits, Medicare prescription-drug benefits, and consumer energy tax credits. We construct these measures using IRS Statistics of Income records and Centers for Medicare & Medicaid Services enrollment data. Conditional on media market fixed effects and the baseline controls, the partial correlations between each IRA exposure measure and eligibility range from -0.20 to 0.14. Including the IRA exposure measures, each interacted with week fixed effects, leaves our main results essentially unchanged (Appendix Table B.4, column 5, and Appendix Figure B.4).

III.3 Liquidity Constraints

For debt relief expectations to affect households' decision-making, it is crucial that borrowers have sufficient financial flexibility to smooth consumption across time. To investigate the role of liquidity constraints, we conduct a triple difference-in-differences exercise, estimating specifications of the form:

$$\begin{aligned} Y_{ikt} = \beta_{DDD} &\textit{Eligible Share}_k \times \textit{Post}_t \times \textit{High Delinquency}_k \\ &+ \beta_2 \textit{High Delinquency}_k \times \textit{Post}_t \\ &+ \beta_3 \textit{Eligible Share}_k \times \textit{Post}_t + \mu_i + \tau_t + \epsilon_{ikt}. \end{aligned} \tag{3}$$

We introduce $\textit{High Delinquency}_k$ which is an indicator for whether counties have a share with any debt in collections greater than 26%, the national rate. Our hypothesis is that due to liquidity constraints, financially delinquent households would be less able to smooth consumption following President Biden's debt relief announcement. Therefore, our parameter of interest is β_{DDD} which captures the differential effect of exposure to eligible borrowers on retail stores in high-delinquency counties relative to those in low-delinquency counties following Biden's loan forgiveness announcement.

In line with our interpretation, column (3) of Table 3 shows that the positive spending response is absent in high-delinquency counties as β_{DDD} completely offsets β_3. For retail stores located in low-delinquency counties, we estimate that a 1 percentage point higher share of eligible student loan borrowers led to a 0.3% increase in weekly sales following the announcement.[15] This pattern is also consistent with Dinerstein, Yannelis and Chen (2024), who find stronger responses to student loan relief among borrowers without prior delinquencies. Together with Eaglin et al. (2025), our estimates suggest that the effects of debt relief depend importantly on borrowers' underlying financial slack.

For comparison purposes, we conduct similar exercises for high student loan debt and high student loan payment counties in columns (1) and (2), where the thresholds are defined relative to national medians. We find that the spending response was higher in counties with relatively lower outstanding student loan balances, where a greater number of borrowers stood to receive cancellation of their entire debt balances. In contrast, we do not observe statistically significant, differential spending responses between counties with higher rather than lower student loan payment amounts, consistent with the policy affecting expected debt balances rather than contemporaneous liquidity.

III.4 Spending by Broad Product Category

The preceding analyses document the effects of the debt relief announcement on consumption as a whole. To better understand the composition of this response, we next exploit the granularity of the scanner data and estimate our baseline specification separately across broad product categories.

Figure 4 displays the resulting category-level treatment effects. The pattern is mixed but generally tilted toward higher spending in the post-announcement period. Several categories exhibit positive estimates of comparable magnitude to the baseline effect, including grocery, non-food grocery, health and beauty care, non-alcoholic beverages, and baby products. The largest positive response appears in alcoholic beverages and mixers.

By contrast, general merchandise shows a negative estimate which could reflect real options logic where the value of waiting or postponing purchases of durable goods becomes more valuable when uncertainty is higher (Romer, 1990; Eberly, 1994; Bloom, 2014). In this case, some households may have delayed purchases of more durable goods like electronics and kitchen appliances until the resolution of legal uncertainty surrounding the student loan forgiveness plan.

[15] We also observe a small but statistically significant time trend among high-delinquency counties relative to low delinquency ones. This could be due to different seasonal spending patterns between the two groups.

	(1)	(2)	(3)
Eligible Share x Post	0.17***	0.075	0.32***
	(0.050)	(0.046)	(0.085)
High SL Debt x Post	0.022*		
	(0.013)		
Eligible Share x High SL Debt x Post	-0.12*		
	(0.068)		
High SL Payment x Post		-0.021	
		(0.016)	
Eligible Share x High SL Payment x Post		0.100	
		(0.087)	
High Delinquency x Post			0.057***
			(0.016)
Eligible Share x High Delinquency x Post			-0.33***
			(0.088)
Store FE	YES	YES	YES
Week FE	NO	NO	NO
Market-Week FE	YES	YES	YES
Parent-Week FE	YES	YES	YES
Channel-Week FE	YES	YES	YES
Demographics-Week FE	YES	YES	YES
R-squared	0.99	0.99	0.99
Observations	781447	770410	797893

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Triple Differences. This table reports the results of regression 3. The data are at the store-week level and cover the weeks of July 10, 2022 to October 16, 2022. The outcome variable is $ln(sales)$. Eligible Share is the share of adults in a county who were eligible for loan forgiveness, and Post is an indicator for whether a week falls around or after August 24, 2022. High Delinquency is an indicator for whether the share with any debt in collections in a county is greater than 26%. High SL Debt is an indicator for whether the median student loan debt balance in a county is greater than $20,108. High SL Payment is an indicator for whether the median student loan debt payment in a county is greater than $160. The demographic controls include: median household income, total population, partisanship, under-18 and college enrollment shares of the population. Standard errors are clustered at the county level.

Taken together, the figure suggests that the overall increase in retail spending is not driven by a single narrow class of goods. Instead, positive responses appear across several everyday consumption categories, consistent with an increase in day-to-day household spending following the announcement. At the same time, the dispersion in estimates indicates meaningful heterogeneity in how households adjusted purchases across types of goods. Because our outcome is sales, the es-

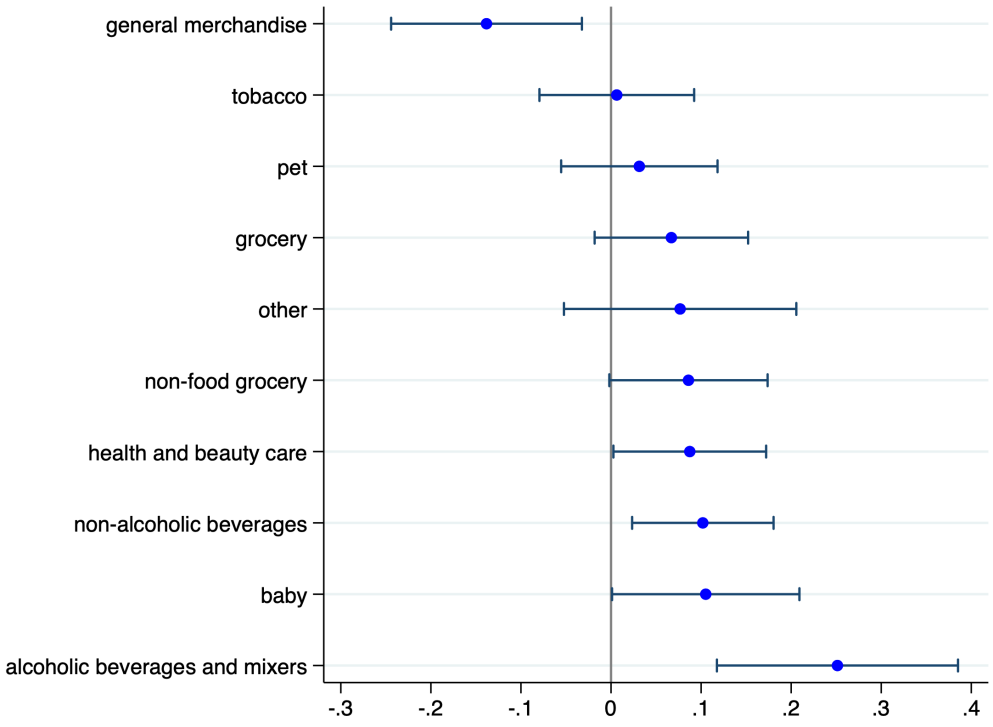


Figure 4: Heterogeneous Effects by Spending Category. This figure plots estimated coefficients and 95% confidence intervals from regression 1, estimated separately for each product category type. The data are at the store-week level and cover the weeks of July 10, 2022 to October 16, 2022. The outcome variable is $ln(sales)$. The specification includes fixed effects for the following groups, interacted with dummies for each week: designated market area, parent company, retail channel, median household income, total population, partisanship, under-18 and college enrollment shares of the population. Standard errors are clustered at the county level.

timated increases may reflect changes in quantities purchased, shifts toward higher-priced varieties, or both.

III.5 Supreme Court Decision

In this subsection, we study the impact of the Supreme Court decision on consumption. In June 2023, the Supreme Court ruled the Biden administration's debt relief plan unconstitutional.[16] Ensuring that no borrowers received loan forgiveness under the plan, the Supreme Court decision represented a negative wealth shock to the extent that legal uncertainty about the plan's future remained. The justices voted 6-3 in *Biden v. Nebraska* holding that the administration overstepped its authority under the Higher Education Relief Opportunities for Students Act of 2003.

[16]For legal details, see Amy Howe, "Supreme Court strikes down Biden student-loan forgiveness program," *SCOTUSblog*, June 30, 2023.

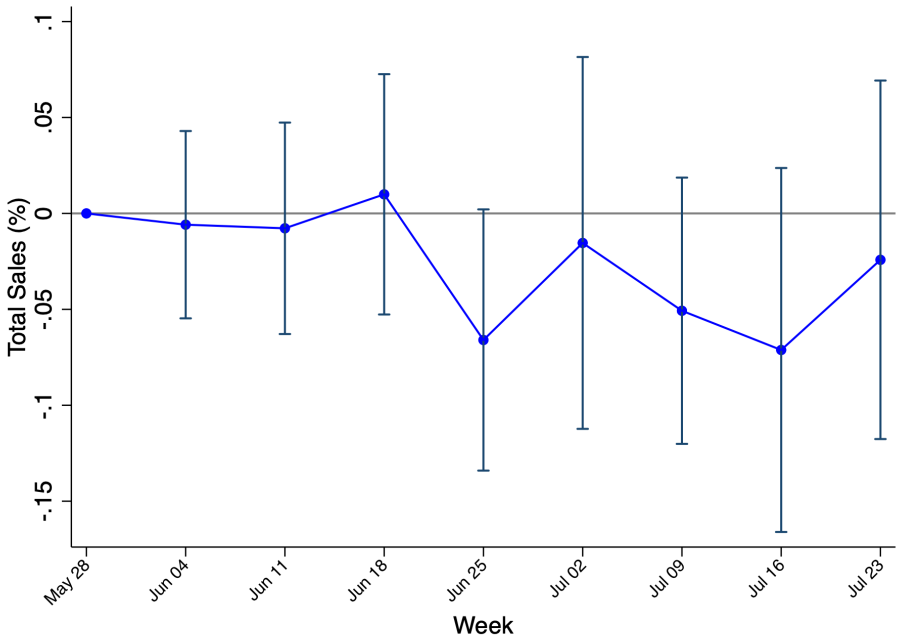


Figure 5: Dynamics of Spending Response. This figure reports estimated coefficients and 95% confidence intervals from regression 2. The data are at the store-week level and cover the weeks of May 28, 2023 to July 23, 2023. The specification includes fixed effects for the following groups, interacted with dummies for each week: designated market area, parent company, retail channel, median household income, total population, partisanship, under-18 and college enrollment shares of the population. Standard errors are clustered at the county level.

Figure 5 documents that retail stores located in counties with a 1 percentage point higher share of eligible student loan borrowers experienced a sharp drop in weekly sales of around 0.05% at the time of the Supreme Court decision. The negative impact is statistically significant at the 10% level. The lower economic magnitude, relative to our main tests, suggests that borrowers had already partially incorporated news about the legality of the debt relief plan and updated their beliefs about forthcoming changes in their permanent income.[17]

Contemporaneous prediction-market pricing is consistent with this interpretation. On June 24, 2023, the Kalshi contract on whether the Supreme Court would permit student loan forgiveness implied a 37% probability of forgiveness. Similarly, Koustas, Weber and Yannelis (2026) find a mean forgiveness belief of approximately 30% before the Supreme Court decision in their sample. They also find that respondents assigned about a two-thirds probability that the Court would rule forgiveness unconstitutional.

[17]We also find that the estimates by quartile of county eligible share exposure mirror the previous ones focusing on the initial announcement (Appendix Table B.6 and Appendix Figure B.5).

III.6 Debt Relief Applications

Finally, we present further evidence that our results align with a beliefs channel and document demographic differences in belief formation. Using zip code-level counts of debt relief applications that borrowers submitted via `https://studentaid.gov/debt-relief/application`, we first estimate the following equation:

$$Application\ Share_k = \beta Eligible\ Share_k + \delta_k' X_k + \epsilon_k, \tag{4}$$

where $Application\ Share_k$ represents the number of debt relief applications in a given zip code as a share of the adult population. The intuition behind this test is straightforward: if eligible borrowers were either unaware of the loan forgiveness plan or assigned a low subjective probability to receiving debt relief, we would expect $\beta = 0$. For instance, student loan borrowers would not have incurred the minimal temporal cost required to complete the application if they accurately anticipated the Supreme Court decision. In contrast, we find that application counts strongly correlate with student loan eligibility (Table 4). Column (3) shows that a 1 percentage point increase in the eligible share within a zip code is associated with a 0.63 percentage point increase in the application share.

We interpret these results primarily through a beliefs channel rather than an attention mechanism. This is because news about the debt relief plan was widely disseminated, and the Department of Education notified individual borrowers via email. One important caveat is that we cannot account for procrastination. Some borrowers, despite being well-informed and optimistic about the likelihood of loan forgiveness, may have delayed submitting their applications. Since the Department of Education was forced to suspend processing debt relief applications one month into the launch of the website, we do not observe the universe of eventual debt relief applicants.

Keeping this caveat in mind, we compute the application take-up rate within each zip code, as our proxy for beliefs, and document demographic differences via cross-sectional regressions using Census Bureau data. The third column of Table 5 shows that zip codes with a higher proportion of women and high-income households especially have higher debt relief take-up rates. Notably, we also observe a positive relationship between the share of donors to the Democratic Party and take-up rates.

For comparison purposes, we report demographic associations with the eligible share in column (1) and the application share in column (2). We observe that eligibility is increasing in income,

	(1)	(2)	(3)
Eligible Share	0.60***	0.59***	0.63***
	(0.0045)	(0.0058)	(0.0041)
County FE	NO	YES	YES
Demographics	NO	NO	YES
R-squared	0.86	0.93	0.97
Observations	18802	18094	15817

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Student Loan Borrowers Anticipated Debt Relief. This table reports the results of regression 4. The outcome variable is debt relief applications as a share of the adults in a zip code. Eligible Share is the share of adults in a zip code who were eligible for loan forgiveness. We control for gender, race, education, income categories, population groups, and partisanship. Standard errors are clustered at the county level.

which suggests that the debt relief policy was regressive in nature.[18] Interestingly, zip codes with a higher proportion of Asian borrowers and those aged 18-34 are associated with lower eligible and application shares, yet higher take-up rates.

Appendix Table B.7 provides evidence that social networks shaped borrowers' beliefs about the debt relief program. Using measures from the Social Capital Atlas, we find that zip codes with greater economic connectedness have higher take-up rates (Chetty et al., 2022*a*,*b*). Quantitatively, a one standard deviation increase in economic connectedness is associated with a 1.3 percentage point increase in take-up, after controlling for county fixed effects and local demographics. This pattern complements the positive income gradient documented in Table 5: take-up was higher not only in higher-income zip codes, but also in places where lower socioeconomic status (SES) borrowers were more connected to higher-SES peers.

III.7 Delinquencies

The debt relief plan announcement and subsequent reversal results concern immediate spending responses. In this subsection, we consider longer-term effects of the period of heightened legal uncertainty and student loan policy changes.

We begin by examining whether the geography of eligibility predicts financial distress in the years following President Biden's announcement. We estimate the following equation:

[18] However, many borrowers living in low-income zip codes may have been eligible for the full $20,000 in loan forgiveness.

	Eligible Share	App Share	Take-up Rate
Biden's 2020 donation share	0.019***	0.018***	0.060***
	(0.0035)	(0.0023)	(0.0045)
Female share	0.15***	0.12***	0.25***
	(0.013)	(0.0085)	(0.019)
Bachelor degree or higher share	0.081***	0.070***	0.15***
	(0.0068)	(0.0050)	(0.011)
Population [18-34] years old share	-0.055***	-0.015*	0.061***
	(0.012)	(0.0087)	(0.020)
Population [35-50] years old share	0.026	0.038***	0.052*
	(0.021)	(0.014)	(0.028)
Population 50+ years old share	-0.14***	-0.071***	0.0077
	(0.011)	(0.0076)	(0.016)
Black alone share	0.15***	0.086***	0.023***
	(0.0046)	(0.0027)	(0.0050)
Asian alone share	-0.090***	-0.047***	0.058***
	(0.0082)	(0.0056)	(0.017)
Income <25k share	0.16***	0.090***	-0.014
	(0.013)	(0.0094)	(0.021)
Income [25-50k) share	0.17***	0.11***	0.073***
	(0.013)	(0.0098)	(0.022)
Income [50-100k) share	0.22***	0.16***	0.20***
	(0.013)	(0.0099)	(0.021)
Income [100-200k) share	0.27***	0.21***	0.38***
	(0.011)	(0.0086)	(0.020)
Mean of Outcome	0.15	0.088	0.57
R-squared	0.48	0.47	0.51
Observations	16660	16660	16660

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Demographic Correlates of Debt Relief. This table reports cross-sectional regressions of debt relief eligibility, applications, and take-up on zip code-level demographic information. The omitted category for age is the fraction of the population that is < 18. The omitted category for income is the fraction of the population with income $>$ \$200k. Eligible Share is the share of adults in a zip code who were eligible for loan forgiveness. App Share is the share of adults in a zip code who applied for student debt relief. Take-up Rate is the number of applications as a share of the number of eligible borrowers in a zip code. Standard errors are clustered at the county level.

$$Y_{cst} = \mu_c + \lambda_t + \sum_{t \neq \text{Feb 2022}} \beta_t \left(\text{Eligible Share}_c \times \text{wave}_t\right) + \sum_{t \neq \text{Feb 2022}} \delta_t' \left(X_c \times \text{wave}_t\right) + \varepsilon_{cst}, \qquad (5)$$

where c indexes counties, s states, and t the five credit bureau snapshots. February 2022 is the

omitted reference wave.[19] The outcome is the share of people with a credit bureau record with any debt in collections. Although this measure captures delinquencies on both student and non-student debt, we use it as our primary outcome because of its consistent definition across all snapshots. μ_c and λ_t are county and snapshot year fixed effects respectively. X_c is similar to before but additionally includes the share of medical debt in collections to account for credit bureau reporting changes during the sample period. The results are robust to its exclusion.

Figure 6 shows no differential movement in collections before the announcement: the 2018 and December 2020 coefficients are small and jointly indistinguishable from zero. The August 2023 coefficient is positive but imprecise. By August 2025, after payments had resumed and the additional 12-month on-ramp had expired, collections had risen in more-exposed counties relative to less-exposed ones. Concretely, a 1 percentage point higher eligible share is associated with a 7.5 basis point (bp) higher share of adults with any debt in collections.

We complement the event-study specification with a cross-sectional analysis that allows us to examine student loan delinquencies alongside broader collections activity. Appendix Table B.8 reports the results. We find that a one percentage point increase in the eligible share is associated with an approximately 12 basis point increase in the student loan delinquency rate and an 8 basis point increase in the share of adults with any debt in collections in 2025.[20]

IV Conclusion

In this paper, we provide empirical evidence on how households adjust consumption in response to news about future liabilities. Using comprehensive data on borrowers eligible for debt relief linked to high-frequency spending data, we find that stores in counties with greater exposure to eligible borrowers experienced higher sales following President Biden's August 2022 student loan forgiveness announcement. This response was absent in counties with high pre-announcement delinquency rates, consistent with liquidity constraints limiting households' ability to smooth consumption. We also document a decline in sales following the Supreme Court decision striking down the plan. Together with widespread debt relief applications, these opposing responses indicate that borrowers assigned a meaningful probability to receiving forgiveness that ultimately did not materialize.

[19] The 2018 snapshot does not indicate a specific month. The first two snapshots are 2% representative samples and while the latter three are 4% samples of underlying credit bureau data.

[20] The student loan sample is smaller because Urban suppresses delinquency rates in counties with relatively few student loan holders. In addition, the latest snapshot reports student loan delinquency rather than student loan default.

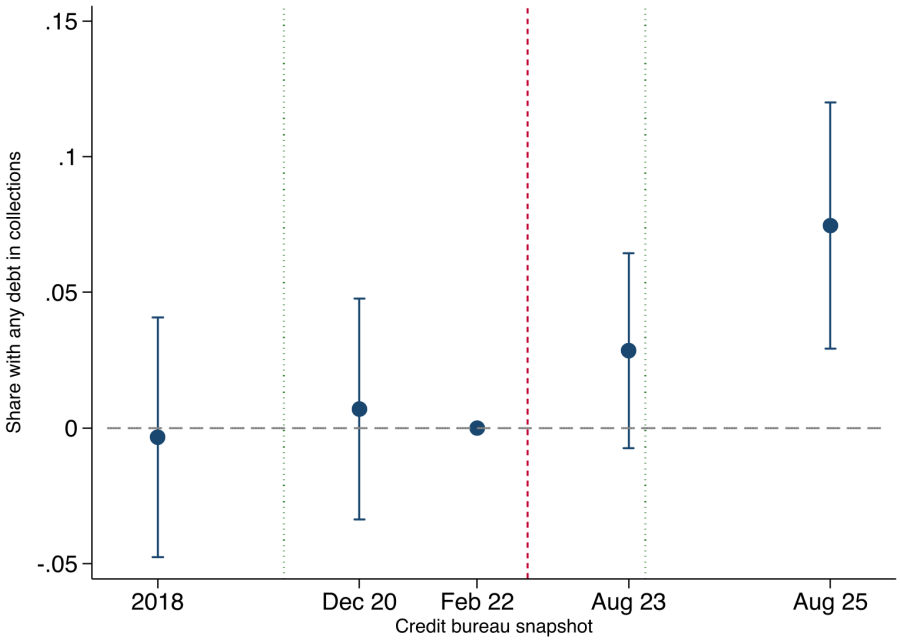


Figure 6: Share with any Debt in Collections. This figure reports estimated coefficients and 95% confidence intervals from regression 5. The data are at the county-snapshot level and cover five Urban Institute credit bureau snapshots. The outcome is the share of people with a credit bureau record with any debt in collections. February 2022, the last snapshot before the August 2022 announcement, is the omitted reference period. The specification includes county and snapshot fixed effects, and controls for the following county characteristics, each interacted with dummies for every snapshot: median household income, total population, partisanship, the under-18, college enrollment, and medical debt in collections shares of the population. The dashed vertical line marks the August 2022 announcement of debt relief; the dotted vertical lines mark the start of the payment pause in March 2020 and the resumption of required payments in October 2023. Standard errors are clustered at the state level.

Because no borrowers received forgiveness under the plan, our estimates do not capture the long-term effects of realized debt cancellation. Instead, they isolate households' initial responses to news about a future reduction in liabilities and its subsequent reversal. The absence of a contemporaneous change in required payments further suggests that beliefs about future balance sheets can affect current consumption. More broadly, our findings highlight the role of policy communication in shaping expectations and economic behavior, even when policy implementation remains uncertain.

While our results indicate that student loan forgiveness can have stimulatory effects, assessing the fiscal cost-effectiveness of such policies lies beyond the scope of this paper. The subsequent increase in delinquencies in more-exposed counties highlights the importance of studying the longer-run consequences of policy uncertainty and unrealized relief. An additional, important avenue for

further research is to evaluate the full welfare effects of student loan forgiveness, taking distributional considerations seriously as in Catherine and Yannelis (2023).

Bibliography

Baker, Scott R., Nicholas Bloom, and Steven J. Davis. 2016. "Measuring Economic Policy Uncertainty." *The Quarterly Journal of Economics*, 131(4): 1593–1636.

Baugh, Brian, Itzhak Ben-David, Hoonsuk Park, and Jonathan A. Parker. 2021. "Asymmetric Consumption Smoothing." *American Economic Review*, 111(1): 192–230.

Bloom, Nicholas. 2014. "Fluctuations in Uncertainty." *Journal of Economic Perspectives*, 28(2): 153–176.

Callaway, Brantly, Andrew Goodman-Bacon, and Pedro HC Sant'Anna. 2024. "Difference-in-differences with a continuous treatment." National Bureau of Economic Research.

Catherine, Sylvain, and Constantine Yannelis. 2023. "The distributional effects of student loan forgiveness." *Journal of Financial Economics*, 147(2): 297–316.

Cespedes, Jacelly, Carlos Parra, and Clemens Sialm. 2026. "The Effect of Principal Reduction on Household Distress: Evidence from Mortgage Cramdown." *The Review of Financial Studies*, 39(2): 518–561.

Chetty, Raj, Matthew O. Jackson, Theresa Kuchler, Johannes Stroebel, Nathaniel Hendren, Robert Fluegge, Sara Gong, Federico Gonzalez, Armelle Grondin, Matthew Jacob, Drew Johnston, Martin Koenen, Eduardo Laguna-Muggenberg, Florian Mudekereza, Tom Rutter, Nicolaj Thor, Wilbur Townsend, Ruby Zhang, Mike Bailey, Pablo Barberá, Monica Bhole, and Nils Wernerfelt. 2022*a*. "Social Capital I: Measurement and Associations with Economic Mobility." *Nature*, 608(7921): 108−−121.

Chetty, Raj, Matthew O. Jackson, Theresa Kuchler, Johannes Stroebel, Nathaniel Hendren, Robert Fluegge, Sara Gong, Federico Gonzalez, Armelle Grondin, Matthew Jacob, Drew Johnston, Martin Koenen, Eduardo Laguna-Muggenberg, Florian Mudekereza, Tom Rutter, Nicolaj Thor, Wilbur Townsend, Ruby Zhang, Mike Bailey, Pablo Barberá, Monica Bhole, and Nils Wernerfelt. 2022*b*. "Social Capital II: Determinants of Economic Connectedness." *Nature*, 608(7921): 122−−134.

Chopra, Felix, Christopher Roth, and Johannes Wohlfart. 2025. "Home Price Expectations and Spending: Evidence from a Field Experiment." *American Economic Review*, 115(7): 2267–2305.

Colarieti, Roberto, Pierfrancesco Mei, and Stefanie Stantcheva. 2024. "The How and Why of Household Reactions to Income Shocks."

Di Maggio, Marco, Ankit Kalda, and Vincent Yao. 2026. "Second Chance: Life with Less Student Debt." *The Journal of Finance*, 81(1): 507–550.

Dinerstein, Michael, Constantine Yannelis, and Ching-Tse Chen. 2024. "Debt Moratoria: Evidence from Student Loan Forbearance." *American Economic Review: Insights*, 6(2): 196–213.

Dinerstein, Michael, Samuel Earnest, Dmitri K. Koustas, and Constantine Yannelis. 2025. "Student Loan Forgiveness."

Dobbie, Will, and Jae Song. 2020. "Targeted Debt Relief and the Origins of Financial Distress: Experimental Evidence from Distressed Credit Card Borrowers." *American Economic Review*, 110(4): 984–1018.

Dubois, Pierre, Rachel Griffith, and Martin O'Connell. 2022. "The Use of Scanner Data for Economics Research." *Annual Review of Economics*, 14(Volume 14, 2022): 723–745.

Eaglin, Christopher, Apoorv Gupta, Filippo Mezzanotti, and Jonathan Zinman. 2025. "Working it out: Randomized Modification and Entrepreneurial Effort in a Collateralized Debt Market."

Eberly, Janice. 1994. "Adjustment of Consumers' Durables Stocks: Evidence from Automobile Purchases." *Journal of Political Economy*.

Fuster, Andreas, and Basit Zafar. 2023. "Survey experiments on economic expectations." In *Handbook of Economic Expectations*. 107–130. Elsevier.

Fuster, Andreas, Greg Kaplan, and Basit Zafar. 2021. "What Would You Do with $500? Spending Responses to Gains, Losses, News, and Loans." *The Review of Economic Studies*, 88(4): 1760–1795.

Ganong, Peter, and Pascal Noel. 2020. "Liquidity versus Wealth in Household Debt Obligations: Evidence from Housing Policy in the Great Recession." *American Economic Review*, 110(10): 3100–3138.

Garmaise, Mark J., Yaron Levi, and Hanno Lustig. 2024. "Spending Less after (Seemingly) Bad News." *The Journal of Finance*, 79(4): 2429–2471.

Gopalan, Radhakrishnan, Barton H. Hamilton, Jorge Sabat, and David Sovich. 2024. "Aversion to Student Debt? Evidence from Low-Wage Workers." *The Journal of Finance*, 79(2): 1249–1295.

Indarte, Sasha. 2023. "Moral Hazard versus Liquidity in Household Bankruptcy." *The Journal of Finance*, 78(5): 2421–2464.

Kaplan, Greg, and Giovanni L. Violante. 2022. "The Marginal Propensity to Consume in Heterogeneous Agent Models." *Annual Review of Economics*, 14(Volume 14, 2022): 747–775.

Koustas, Dmitri K, Michael Weber, and Constantine Yannelis. 2026. "Beliefs and Actions under Government Policy Uncertainty: Evidence from Student Loan Forgiveness." National Bureau of Economic Research.

Looney, Adam, and Constantine Yannelis. 2024. "What Went Wrong with Federal Student Loans?" *Journal of Economic Perspectives*, 38(3): 209–236.

Meeuwis, Maarten, Jonathan A. Parker, Antoinette Schoar, and Duncan Simester. 2022. "Belief Disagreement and Portfolio Choice." *The Journal of Finance*, 77(6): 3191–3247.

Romer, Christina D. 1990. "The Great Crash and the Onset of the Great Depression." *The Quarterly Journal of Economics*, 105(3): 597–624.

Urban Institute. 2024. "Debt in America: An Interactive Map." Accessed: 2024-12-24.

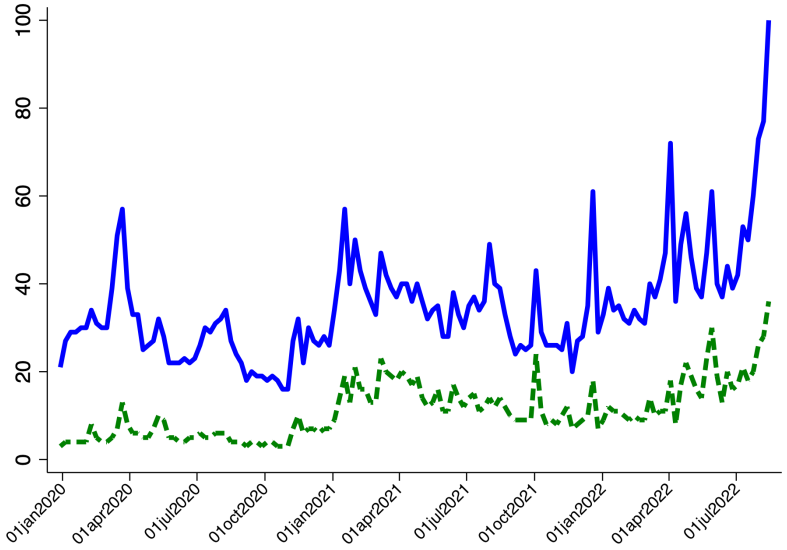
White House. 2022. "Fact Sheet: President Biden Announces Student Loan Relief for Borrowers Who Need It Most." Accessed: 2024-12-24.

Yannelis, Constantine, and Greg Tracey. 2022. "Student Loans and Borrower Outcomes." *Annual Review of Financial Economics*, 14(Volume 14, 2022): 167–186.

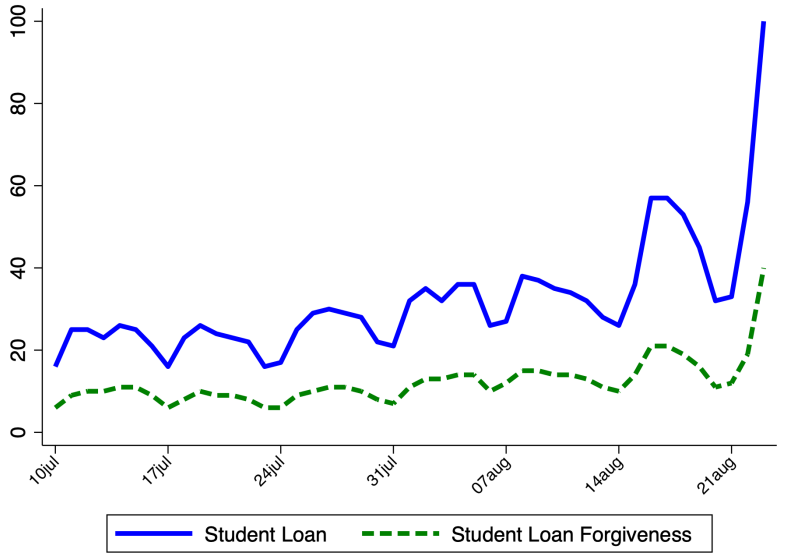
Appendix A Description of Variables

Variables	Description
Department of Education	
Eligible student loan borrowers	The number of borrowers who were eligible for forgiveness under the plan.
Student loan debt relief applications	The number of submitted debt relief applications.
Urban Institute	
Share with student loan debt	Share of people with a credit bureau record who have any student loan debt; includes student accounts that are open, deferred, and in collections.
Median student loan debt	Median amount of all student loan debt among those with any student loan debt.
Median monthly student loan payment	Median amount of monthly student loan payment owed on open accounts among those with open accounts.
Share with any debt in collections	Share of people with a credit bureau record who have any debt in collections. Debt in collections includes past-due credit lines that have been closed and charged-off on the creditor's books as well as unpaid bills reported to the credit bureaus that the creditor is attempting to collect. For example, credit card accounts enter collections status once they are 180 days past due.
Student loan delinquency rate	Share of student loan holders with loans that are 60 days or more past due or in default. (August 2025 credit bureau data)
Student loan default rate	Share of people with any student loan debt who have student loan debt in collections/default (February 2022 credit bureau data)

Appendix B Additional Figures and Tables



(a)



(b)

Figure B.1: Google Trends (before). This figure plots weekly aggregate Google searches for 'student loan' and 'student loan forgiveness'. Panel (a) covers the weeks of December 29, 2019 to August 14, 2022. Panel (b) covers the days of July 10, 2022 to August 23, 2022. The counts are normalized and presented on a scale from 0-100, where 100 is the maximum search interest.

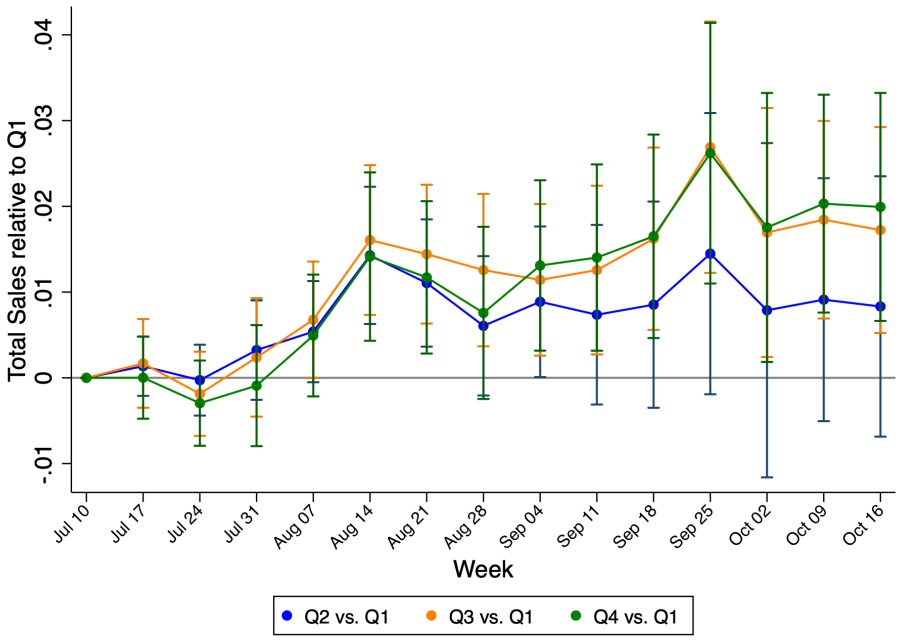
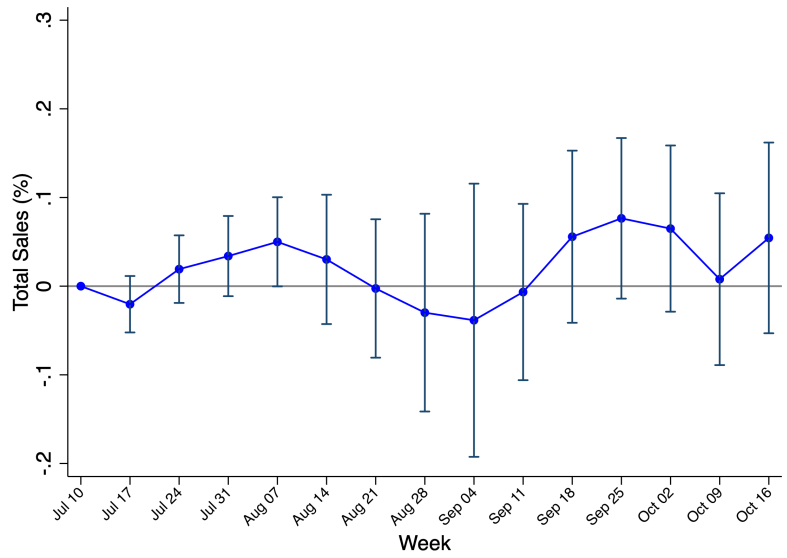
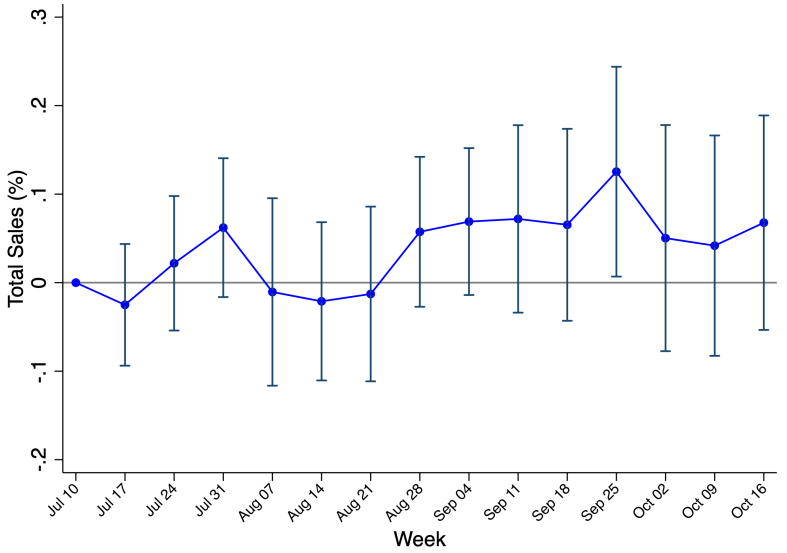


Figure B.2: Dynamics of Spending Response by County Exposure Quartile. This figure reports event-study coefficients and 95% confidence intervals from a quartile-based difference-in-differences specification estimating the effect of President Biden's August 24, 2022 student loan forgiveness announcement on retail sales. The data are at the store-week level and cover the weeks of July 10, 2022 to October 16, 2022. The outcome variable is ln(sales). Counties are assigned to quartiles based on their pre-announcement eligible share, defined as the share of adults in the county eligible for debt relief. Quartile 1 (Q1) is omitted, so the reported coefficients trace week-by-week differences in sales for stores located in counties in quartiles 2–4 relative to stores in the lowest-exposure quartile. The specification includes fixed effects for the following groups, each interacted with week dummies: designated market area, parent company, retail channel, median household income, total population, partisanship, and the under-18 and college-enrollment shares of the population. Standard errors are clustered at the county level.



(a) 2021



(b) 2023

Figure B.3: Placebo Tests. This figure reports estimated coefficients and 95% confidence intervals from regression 2. The data are at the store-week level and cover weeks in 2021 (Panel a) and 2023 (Panel b). The specification includes fixed effects for the following groups, interacted with dummies for each week: designated market area, parent company, retail channel, median household income, total population, partisanship, under-18 and college enrollment shares of the population. Standard errors are clustered at the county level.

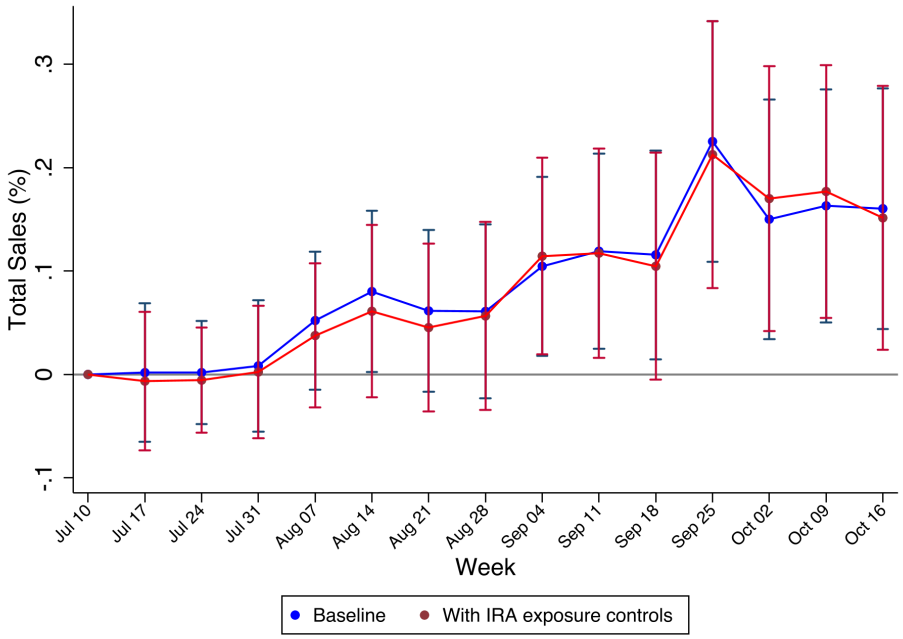


Figure B.4: Dynamics of Spending Response (IRA controls). This figure reports estimated coefficients and 95% confidence intervals from regression 2. The data are at the store-week level and cover the weeks of July 10, 2022 to October 16, 2022. The specification includes fixed effects for the following groups, interacted with dummies for each week: designated market area, parent company, retail channel, median household income, total population, partisanship, under-18 and college enrollment shares of the population, Affordable Care Act (ACA) advance premium tax credit claim rate and dollar amount per claimant, residential energy credit claim rate and dollar amount per claimant, and Medicare Part D and Low-Income Subsidy take-up rates. Standard errors are clustered at the county level.

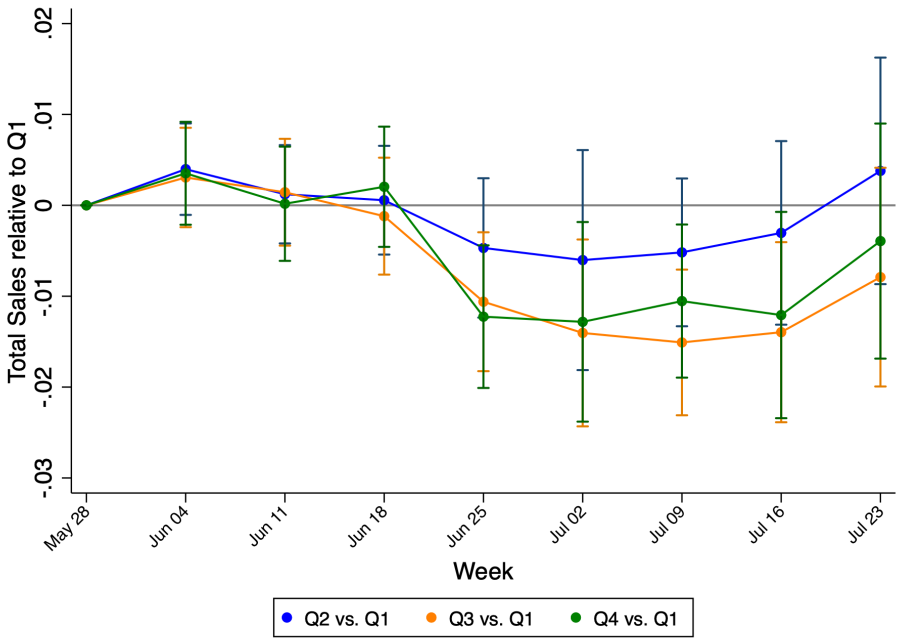


Figure B.5: Dynamics of Spending Response by County Exposure Quartile. This figure reports event-study coefficients and 95% confidence intervals from a quartile-based difference-in-differences specification estimating the effect of the June 30, 2023 Supreme Court decision on retail sales. The data are at the store-week level and cover the weeks of May 28, 2023 to July 23, 2023. The outcome variable is ln(sales). Counties are assigned to quartiles based on their pre-announcement eligible share, defined as the share of adults in the county eligible for debt relief. Quartile 1 (Q1) is omitted, so the reported coefficients trace week-by-week differences in sales for stores located in counties in quartiles 2–4 relative to stores in the lowest-exposure quartile. The specification includes fixed effects for the following groups, each interacted with week dummies: designated market area, parent company, retail channel, median household income, total population, partisanship, and the under-18 and college-enrollment shares of the population. Standard errors are clustered at the county level.

	Mean	SD	p10	p25	p50	p75	p90	N
Drug	52.71	29.90	22.04	32.79	48.07	65.86	87.49	268,288
Food	603.13	362.51	237.06	353.66	528.25	761.59	1,069.90	166,431
Convenience	41.27	20.21	19.94	27.58	37.68	51.02	67.14	176,768
Liquor	84.05	62.09	22.82	41.37	72.70	103.83	153.40	4,274
Mass Merchandiser	136.41	245.11	15.43	20.98	30.71	91.70	534.10	183,288
Total	184.19	298.36	20.05	30.00	50.23	137.26	613.19	799,049

Table B.1: Summary statistics. This table reports summary statistics on weekly spending by store type. The data are at the store-week level and cover the weeks of July 10, 2022 to October 16, 2022. Sales are reported in thousands of dollars.

	(1)	(2)	(3)	(4)
SL Debt Share x Post	0.24***	0.31***	0.36***	0.24***
	(0.035)	(0.062)	(0.062)	(0.063)
Store FE	YES	YES	YES	YES
Week FE	YES	NO	NO	NO
Market-Week FE	NO	YES	YES	YES
Parent-Week FE	NO	NO	YES	YES
Channel-Week FE	NO	NO	YES	YES
Demographics-Week FE	NO	NO	NO	YES
R-squared	0.99	0.99	0.99	0.99
Observations	798906	798696	798681	797893

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.2: Spending at Retail Stores Post-Announcement. This table reports the results of regression 1. The data are at the store-week level and cover the weeks of July 10, 2022 to October 16, 2022. The outcome variable is $ln(sales)$. SL Debt Share is the share of people in a county with a credit bureau record who have any student loan debt, and Post is an indicator for whether a week falls around or after August 24, 2022. The demographic controls include: median household income, total population, partisanship, under-18 and college enrollment shares of the population. Standard errors are clustered at the county level.

	(1)	(2)	(3)	(4)
Eligible Share x Post	0.23***	0.22***	0.23***	0.092**
	(0.034)	(0.044)	(0.044)	(0.036)
Store FE	YES	YES	YES	YES
Week FE	YES	NO	NO	NO
Market-Week FE	NO	YES	YES	YES
Parent-Week FE	NO	NO	YES	YES
Channel-Week FE	NO	NO	YES	YES
Demographics-Week FE	NO	NO	NO	YES
R-squared	0.994	0.995	0.995	0.995
Observations	785550	785340	785325	785325

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.3: Spending at Retail Stores Post-Announcement (restricted). This table reports the results of regression 1. The data are at the store-week level and cover the weeks of July 10, 2022 to October 16, 2022. We omit stores that do not report sales information in each week of the year. The outcome variable is $ln(sales)$. Eligible Share is the share of adults in a county who were eligible for loan forgiveness, and Post is an indicator for whether a week falls around or after August 24, 2022. The demographic controls include: median household income, total population, partisanship, under-18 and college enrollment shares of the population. Standard errors are clustered at the county level.

	(1)	(2)	(3)	(4)	(5)
Eligible Share x Post	0.10***	0.088**	0.12***	0.12***	0.11***
	(0.038)	(0.040)	(0.044)	(0.038)	(0.043)
Store FE	YES	YES	YES	YES	YES
Week FE	NO	NO	NO	NO	NO
Market-Week FE	YES	YES	YES	YES	YES
Parent-Week FE	YES	YES	YES	YES	YES
Channel-Week FE	YES	YES	YES	YES	YES
Demographics-Week FE	YES	YES	YES	YES	YES
IRA x Week	NO	ACA	Energy	Medicare	All three
R-squared	0.99	0.99	0.99	0.99	0.99
Observations	798015	788893	788893	788893	788893

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.4: Spending at Retail Stores Post-Announcement (IRA controls). This table reports the results of regression 1. The data are at the store-week level and cover the weeks of July 10, 2022 to October 16, 2022. The outcome variable is $ln(sales)$. Eligible Share is the share of adults in a county who were eligible for loan forgiveness, and Post is an indicator for whether a week falls around or after August 24, 2022. The demographic controls include: median household income, total population, partisanship, under-18 and college enrollment shares of the population. The Inflation Reduction Act (IRA) controls include: Affordable Care Act (ACA) advance premium tax credit claim rate and dollar amount per claimant, residential energy credit claim rate and dollar amount per claimant, and Medicare Part D and Low-Income Subsidy take-up rates. Standard errors are clustered at the county level.

	Low Exposure			High Exposure			
	Mean	SD	Count	Mean	SD	Count	Diff
Female share	0.49	0.03	1616	0.50	0.02	1586	-0.01
Non-adult share	0.22	0.04	1616	0.23	0.03	1586	-0.01
College enrollment share	0.03	0.09	1616	0.09	0.13	1586	-0.07
Democrat	0.10	0.30	1563	0.22	0.41	1533	-0.12
Median household income	52.85	14.08	1615	61.91	17.29	1586	-9.06
Total Population (log)	9.36	1.08	1616	11.21	1.27	1586	-1.85

Table B.5: Covariate balance. This table reports county-level summary statistics. We define counties as high (low) exposure if the share of eligible student loan borrowers is above (below) the median share within their state. Income is reported in thousands of dollars. We classify Democratic counties as those where the Democratic candidate received the majority of votes in the 2020 presidential election.

	(1)	(2)	(3)	(4)
Eligible Share Q2 x Post	-0.0076	-0.010**	-0.010***	-0.0045
	(0.0049)	(0.0041)	(0.0039)	(0.0043)
Eligible Share Q3 x Post	-0.016***	-0.020***	-0.022***	-0.013***
	(0.0037)	(0.0032)	(0.0031)	(0.0036)
Eligible Share Q4 x Post	-0.021***	-0.025***	-0.026***	-0.012***
	(0.0036)	(0.0033)	(0.0032)	(0.0039)
Store FE	YES	YES	YES	YES
Week FE	YES	NO	NO	NO
Market-Week FE	NO	YES	YES	YES
Parent-Week FE	NO	NO	YES	YES
Channel-Week FE	NO	NO	YES	YES
Demographics-Week FE	NO	NO	NO	YES
R-squared	0.991	0.991	0.992	0.992
Observations	468351	468198	466079	466079
Mean eligible share: Q1	0.097	0.097	0.097	0.097
Mean eligible share: Q2	0.128	0.128	0.128	0.128
Mean eligible share: Q3	0.153	0.153	0.153	0.153
Mean eligible share: Q4	0.197	0.197	0.197	0.197

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.6: Spending at Retail Stores Post-Decision by County Exposure Quartile. This table reports quartile-based difference-in-differences estimates of the effect of the June 30, 2023 Supreme Court decision on retail sales. The data are at the store-week level and cover the weeks of May 28, 2023 to July 23, 2023. The outcome variable is ln(sales). Counties are assigned to quartiles based on their pre-announcement eligible share, defined as the share of adults in the county eligible for debt relief; quartile 1 (Q1) is omitted, so the coefficients on Eligible Share Q $q \times$ Post for $q \in \{2, 3, 4\}$ are interpreted relative to the lowest-exposure quartile. Post is an indicator for whether a week falls around or after June 30, 2023. Mean eligible shares for each quartile are reported at the bottom of the table. The demographic controls include median household income, total population, partisanship, and the under-18 and college-enrollment shares of the population. Standard errors are clustered at the county level.

	(1)	(2)	(3)
Economic connectedness	0.0379***	0.0330***	0.0134***
	(0.00119)	(0.00132)	(0.00116)
Mean of Outcome	0.571	0.571	0.571
County FE	NO	YES	YES
Demographics	NO	NO	YES
R-squared	0.289	0.691	0.784
Observations	16046	15202	15202

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.7: Debt Relief Take-up and Economic Connectedness. This table reports cross-sectional regressions of debt relief take-up on economic connectedness. The outcome variable is the number of debt relief applications as a share of the number of eligible borrowers in a zip code. Economic connectedness is the standardized Social Capital Atlas zip-code measure, defined as two times the share of high-SES friends among low-SES individuals, averaged over all low-SES individuals in the zip code. We control for gender, race, education, income categories, population groups, and partisanship. Standard errors are clustered at the county level.

	SL Delinquency Rate 60+			Any Debt in Collections		
	(1)	(2)	(3)	(4)	(5)	(6)
Eligible Share	0.12**	0.10**	0.12***	0.056**	0.079***	0.082***
	(0.055)	(0.038)	(0.032)	(0.024)	(0.016)	(0.016)
Baseline Controls	YES	YES	YES	YES	YES	YES
State FE	NO	YES	YES	NO	YES	YES
Demographics	NO	NO	YES	NO	NO	YES
1 SD Effect (pp)	0.49	0.40	0.48	0.24	0.33	0.34
Mean of Outcome	0.165	0.165	0.165	0.241	0.241	0.241
R-squared	0.307	0.465	0.494	0.911	0.926	0.929
Observations	2076	2075	2070	3037	3036	3011

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.8: Credit Outcomes in 2025. This table reports estimated coefficients from regression B.1. The outcome in columns 1–3 is the share of student loan holders 60 or more days delinquent in 2025; in columns 4–6 it is the share of people with a credit bureau record with any debt in collections in 2025. Every column controls for the 2022 baseline: the 2022 student loan default rate in columns 1–3, the 2022 collections share in columns 4–6, and in all columns the 2022 share of the population with medical debt in collections. Columns 2, 3, 5 and 6 add state fixed effects; columns 3 and 6 add the following county characteristics: median household income, total population, partisanship, and the under-18 and college enrollment shares of the population. Standard errors are clustered at the state level.

$$Y_{cs,2025} = \alpha + \beta\,\text{Eligible Share}_c + \gamma\,Y_{cs,2022} + \theta\,\text{Medical Collections}_{c,2022} + \delta' X_c + \mu_s + \varepsilon_{cs}. \tag{B.1}$$