Beliefs and Actions under Government Policy Uncertainty: Evidence from Student Loan Forgiveness*

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Abstract

Government announcements about future actions can influence agents' economic choices today. How do beliefs about future government policy affect households' borrowing, spending and debt paydown behavior? We study this question through the lens of student loan forgiveness in the United States, which following electoral promises, was announced in 2022 but never implemented due to judicial rulings. We conduct a customized information provision experiment embedded in a survey eliciting real-time beliefs about future debt forgiveness and repayment, which we link to credit bureau data, employment verification data, and nondurables consumption. Borrowers who are more optimistic about forgiveness reduce payments on student loans and increase non-durable spending, but postpone durable spending while they wait for uncertainty to resolve. Our results provide micro-evidence on the role of policy uncertainty in household decisionmaking, and have implications for government announcements and commitment policy.

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1 Introduction

Governments often make fiscal promises to households, such as commitments to provide targeted benefits or cut taxes. These assurances often come with substantial uncertainty due to political, economic and legal wrangling across multiple branches of administrations and legislatures. How do households' beliefs about future government policy affect their behavior today? And does uncertainty in the implementation of these policies affect how consumers respond to them (Baker, Bloom, and Davis, 2016a; Pastor and Veronesi, 2012). In this paper, we explore how individual expectations affect financial and economic decision-making under uncertainty about future fiscal transfers, exploring consumers' beliefs and their choices to promises of future benefits through a policy that underwent significant tumult after 2020: student loan forgiveness.

Student loan forgiveness was proposed several times by lawmakers in the U.S., but came to the forefront during the 2020 U.S. Presidential election. After different forgiveness plans were proposed during the election, President Biden announced in August 2022 forgiveness via executive order. This promised forgiveness was swiftly blocked by courts following a year-long legal battle which ended in the reversal of broad loan cancellation. Exploiting the period of high uncertainty induced by the challenges of the policy in courts, we ran surveys eliciting expectations of expected student loan forgiveness both along an extensive margin, whether or not it occurs, but also along an intensive margin, by how much, conditional on the implementation of the policy. We linked this survey to credit report and consumption data to study how beliefs about future government policy affect behavior.

We have three main findings. First, we document significant heterogeneity in beliefs. Second, we show that belief heterogeneity translates into behavioral responses. Individuals who have higher beliefs in debt forgiveness make lower monthly payments and are less likely to pay down their student loans. Finally, to study the aggregate implications of our findings at the micro level, we show that mistaken beliefs lead to significant welfare consequences for households.

We begin with a description of the survey instrument, and of how beliefs shifted with the policy environment. Our survey documents wide variation in beliefs about student loan forgiveness. For instance, in mid 2022, the mean belief about 1-year ahead forgiveness was 25 percent, with a standard deviation of 30 percent. We show that these beliefs are sensitive to both news about policy events and experimental treatments regarding the likelihood of loan forgiveness. As part of our survey, we conducted information interventions by presenting news articles that varied the degree of optimism about forgiveness. We repeatedly surveyed consumers over time, which allows us to study the response to major news shocks. Reading an optimistic news article increases forgiveness beliefs by 4 percentage points in our experimental setting and the Biden administration's major student loan announcement in August 2022 moved beliefs by 22 percentage points. Announcements about court injunctions and the Supreme Court decision in June 2023 saw beliefs fall below their pre-2022 levels. These beliefs do not appear to evolve differentially due to pandemic risk or employment shocks faced during the COVID-19 period.

With our linked credit bureau data, we then document how households act on their beliefs about forgiveness. Correlating beliefs about student loan forgiveness with payment behavior, we show that those who are more optimistic about forgiveness/payment moratoriums make fewer payments on their student loans and increase non-durable spending. Individuals in the top two quartiles in terms of the likelihood of loan forgiveness are 30 percentage points less likely to make payments, and on average pay $100 monthly on their student loans. Over the whole period, we see lower rates of durables spending among those who are more optimistic, even after conditioning on other observable differences, suggestive that those with more optimistic beliefs may delay large durable purchases until after the uncertainty is resolved, consistent with real options theory with adjustment frictions (Bernanke, 1983).

These correlations, while suggestive, could be driven by unobservable differences among student borrowers with differing beliefs about the likelihood of student loan forgiveness. We address this concern in two ways. First, we utilize the timing and eligibility criteria of both

policy announcements and legal reversals. Second, we exploit our randomized information treatments, which shifted individuals beliefs about the chances of student loan forgiveness. Both strategies confirm that changes in beliefs have a causal impact on loan repayments.

Our study adds to several strands of the literature. Most directly, we are related to the growing literature on student loans. With $1.7 trillion in student loans outstanding, they have become the second largest component of household balance sheets in the United States after mortgages. We are most closely related to the student loan literature looking at student loan liquidity (Boutros, Clara, and Gomes, 2022; Dinerstein, Yannelis, and Chen, 2024; de Silva, 2023; Black, Denning, Dettling, Goodman, and Turner, 2023; Briones, Powell, and Turner, 2023) and how it is related to non-education activities upon entering repayment (Avery and Turner, 2012; Looney and Yannelis, 2015; Lochner and Monge-Naranjo, 2011, 2016; Goodman, Isen, and Yannelis, 2021). Most directly, the paper also related to a literature on student loan forgiveness (Di Maggio, Kalda, and Yao, 2019; Dinerstein, Earnest, Koustas, and Yannelis, 2024; Catherine and Yannelis, 2022).[1] Our paper contributes to this literature by showing that, in a policy area with substantial uncertainty, belief heterogeneity can affect agents' actions. This has important implications for policy guidance, as statements from policymakers can lead to changes in behavior that have significant welfare consequences for borrowers.

More broadly, we examine consumption and other consumer choices under uncertainty. Economics have noted since at least Ricardo (1821) that beliefs about future actins can affect present behavior. A large body of work exists studying policy uncertainty, for example Bloom (2009) and Baker, Bloom, and Davis (2016b), but only recently the literature started to study how macroeconomic uncertainty causally affects household behavior such as Coibion, Georgarakos, Gorodnichenko, Kenny, and Weber (2024). Relatively little empirical work studies how uncertainty about government policy can affect household decision making. In theory, expectations about government policy can affect individual actions (Barro, 1974). However direct empirical evidence is relatively scant, likely due to the difficulty in linking measured beliefs to outcome data in

[1] Yannelis and Tracey (2022) and Looney and Yannelis (2024) provide more thorough reviews of the student loan literature.

periods of significant uncertainty. We contribute to this literature by showing direct evidence that shifts in beliefs affect real economic outcomes.[2]

Finally, we build on and add to the literature on subjective expectations. For decades, economists had largely ignored expectations of households because of the large dispersion in the cross section and their biases in the time series so much that Prescott (1977) famously said "Like utility, expectations are not observed, and surveys cannot be used."[3] Over the course of the following decades, this view has largely changed and methodological advances in survey design and methodology have contributed to this change (Manski, 2004). A recent body of works shows that the dispersion in expectations at any point in time as well as the apparent biases when evaluated against ex-post realizations can largely be explained by the signals consumers use to form their expectations. For example, in the domain of aggregate inflation expectations, D'Acunto, Malmendier, Ospina, and Weber (2021); D'Acunto, Malmendier, and Weber (2021) show that consumers focus on the price changes of goods in their own consumption bundle in line with the Lucas (1972) island model and especially of goods they purchase frequently rather than goods that they spend lots of money on and put more weight on price increases rather than equal-sized price cuts. Together, these features can rationalize the large dispersion but also the upward bias in expectations. But socioeconomic status (Das, Kuhnen, and Nagel, 2020), cognition (D'acunto, Hoang, Paloviita, and Weber, 2023; D'Acunto, Hoang, Paloviita, and Weber, 2019, 2021), and lifetime experiences also play a role (Goldfayn-Frank and Wohlfart, 2020).

Despite their apparent biases, subjective expectations still matter in determining consumers

[2]While not explicitly focusing on uncertainty, our paper also relates to studies on the governmental response of consumption and debt to government policies. Most directly our paper relates to papers studying loan relief (Agarwal, Amromin, Ben-David, Chomsisengphet, Piskorski, and Seru, 2017), and other lending policies such as household leverage (Mian and Sufi, 2011), monetary policy (Di Maggio, Kermani, Keys, Piskorski, Ramcharan, Seru, and Yao, 2017), and quantitative easing (Di Maggio, Kermani, and Palmer, 2020).Several studies have also explore how debt and consumption respond to income and wealth shocks (Agarwal, Liu, and Souleles, 2007; Mian and Sufi, 2009; Agarwal and Qian, 2014; Baker, 2018; Aydin, 2022), with some work explicitly focusing directly on uncertainty and beliefs (Indarte, Kluender, Malmendier, and Stepner, 2025; Coibion, Georgarakos, Gorodnichenko, Kenny, and Weber, 2024).

[3]There is a related literature on the response of firms to uncertainty. See, e.g. (Bernanke, 1983; Baker, Bloom, and Davis, 2016a; Bloom, Floetotto, Jaimovich, Saporta-Eksten, and Terry, 2018; Kumar, Gorodnichenko, and Coibion, 2023).

economic choices such as their housing decisions (Armona, Fuster, and Zafar, 2019), their consumption and savings decisions (Coibion, Gorodnichenko, and Weber, 2022), or their portfolio choice (Beutel and Weber, 2023; Schnorpfeil, Weber, and Hackethal, 2024; Laudenbach, Weber, Weber, and Wohlfart, 2024). We build on this work in that we implement a randomized information provision experiment embedded in a customized survey to establish causality rather than purely relying on correlations between survey responses and economic decisions. Weber, D'Acunto, Gorodnichenko, and Coibion (2022); D'Acunto, Malmendier, and Weber (2023); D'Acunto and Weber (2024) summarize this literature for inflation expectations, Haaland, Roth, and Wohlfart (2023); Fuster and Zafar (2023) summarize the literature on information provision experiments in economics and provide guidance on how to design them, and Stantcheva (2023) provides best practices on how to design and run a survey. Bachmann, Topa, and van der Klaauw (2022) provides a handbook treatment on the elicitation, patterns, and use of subjective expectations in economics.

The remainder of this paper is organized as follows: In the next section, we discuss the institutional environment of student loans and forgiveness in our period of study. In Section 3, we present our new survey of beliefs about student loan forgiveness and discuss the main results. Section 4 discusses the individual data linkages between our survey and consumption, credit bureau, and employment data. Section 5 presents our main analysis using these linked data, examining the evolution of outcomes by beliefs over time and around key announcements. Section 5.3 presents results from our survey experiment. Section 6 outlines a simple model of payment choice and consumption, which we use to understand the welfare consequences of our results. Section 7 concludes.

2 Background and Institutional Details

2.1 Beliefs About Fiscal Policy and Individual Actions

There is a large body of work studying both empirically and theoretically how beliefs shape the transmission of monetary and fiscal policy. D'Acunto and Weber (2024) provide a recent review of the literature on expectations and household behavior. However there is relatively little work studying how heterogeneity in beliefs about government actions affects financial decision making.

Agents who anticipate debt forgiveness will defer making payments, and avoid prepaying debt. Thus governmental signals about future policies may impact both loan repayment and consumption today. It is straightforward to see this through the simple case of a two-period horizon as a tractable illustration. Assume agents start life having exogenously borrowed B_0 on which they cannot default, which is repaid at interest rate r, and receive exogenous income stream y_t in each period. These agents choose consumption and assets to carry forward in period 1, in order to maximize a standard discounted lifetime utility function with separable and well-behaved per-period utility.

If forgiveness of any remaining balance on the loan inclusive of interest were to occur with certainty in period 2, the optimal period 1 payment choice under full information is 0, if allowed by the lender.[4] The household would maximize their lifetime utility subject to their lifetime wealth as if they had no debt: $y_1 + \frac{y_2}{1+r}$. Depending on their preferences and income path, they may seek to borrow more in period 1 or save through a separate asset, if available, to optimally smooth their consumption.

Now assume forgiveness is uncertain. In $t = 2$, with probability p any remaining debt including interest is forgiven, and with probability $1-p$ the agent must pay back the remaining debt. Further assume $y_1 + \frac{y_2}{1+r} > B_0 > y_t$, i.e. the initial balance is greater than any period

[4] Control over the timing of payments is ultimately a key distinction between the standard consumption and savings model and real-life debt repayment. We will later generalize this model in Section 6 to multiple periods, a separate borrowing/saving instrument, and constrain repayments to an amortization schedule with a choice of payment term.

income but less than lifetime income, and that households have no access to a second asset class to carry forward consumption tomorrow.[5] Under these assumptions, the agent will optimally pay off some debt in period 1 to ensure against the risk of default if the loan is not forgiven in period 2. The balance carried forward must be less than income in period 2, i.e. $(B_0 - b_1^*)(1+r) < y_2$, where b_1^* is the optimal debt payment in period 1, which serves as a "natural borrowing constraint."

If forgiveness occurs, then $c_2^* = y_2$, and if not, then $c_2^* = y_2 - (B_0 - b_1^*)(1+r)$. Hence, the Euler equation with uncertainty about loan forgiveness is given by:

$$u'(y_1 - b_1^*) \;=\; \beta(1+r)\big[pu'(y_2) + (1-p)u'(y_2 - (B_0 - b_1^*)(1+r))\big] \tag{1}$$

As the probability of forgiveness, p, approaches 0, the Euler equation becomes the standard Euler equation without forgiveness, and the household spreads payments over the two periods to optimally smooth their consumption. As p increases, more weight is placed on the higher consumption/lower marginal utility state, and the right-hand-side of the Euler equation decreases; in order for the Euler equation to hold, consumption in period 1 must rise, which is achieved by making a smaller payment today. We explore this intuition further through the context of loan forgiveness which was heatedly debated in the policy and legal sphere: student lending in the United States during the early 2020s.

2.2 Student Lending in the United States

Student loans play an important role in the funding of higher education in the United States, with around half of undergraduate and graduate students in recent years receiving at least some loans as part of aid packages (National Center for Education Statistics, 2023). As of 2020, nearly 43 million individuals held approximately 1.6 trillion in outstanding student loans, which represents the largest source of household debt after mortgages (U.S. Department

[5] This rules out saving and waiting until the next period to pay off the loan after forgiveness is realized.

of Education, 2024; Board of Governors of the Federal Reserve System, 2024).

Student loans can be broadly categorized into federal and private loans, with over 92 percent of outstanding student loan debt being directly held or guaranteed by the federal government.[6] Federal student loans come with several benefits, including fixed interest rates, income-driven repayment plans, and potential loan forgiveness options. The remaining student loan debt is held in private student loans, which also includes federal student loans that have since been refinanced with a private lender, typically at a lower interest rate. Importantly, private student loans are not eligible for any federal student loan relief. Whether federal or private, student loan debt is difficult to discharge in bankruptcy. Delinquency of 270 days or more will typically result in wage garnishment up to 15 percent of disposable income. In 2019, the year before a multi-year payment pause began, over 10 percent of student loan borrowers defaulted within 3 years (U.S. Department of Education, 2019).

2.3 Student Loan Forgiveness

Unlike other consumer loans, student loans are nearly impossible to discharge in bankruptcy.[7] Despite this, some programs exist for student loan cancellation and these have expanded during the early 2020s. Borrowers' loans can be forgiven through Public Service Loan Forgiveness or. Income-Driven Repayment plans, which tie student loan payments to a borrower's income and family size, extending repayment to 10–25 years before remaining balances can be forgiven. Historically, very few borrowers reached forgiveness due to strict requirements, but recent policy changes beginning in 2023—including payment count adjustments, the PSLF waiver, and the introduction of the SAVE plan—have dramatically expanded relief. These adjustments

[6] Guaranteed loans were issued under the Federal Family Education Loan Program (FFEL). Under FFEL, private lenders provided the loans, while the federal government guaranteed the loans against default and provided subsidies to lenders. The FFEL program was discontinued in 2010 and replaced with the Direct Loan Program, while extant FFEL loans continued to be serviced by loan servicers. Yet another type of loan is the Perkins loan, issued by participating schools, with funds provided by the federal government and the participating schools. The Perkins loan program was discontinued in 2017.

[7] To discharge student loans in bankruptcy, borrowers must prove a legal standard called "undue hardship." In a typical year, under 100 student borrowers out of 45 million outstanding in the United States successfully discharge their student loans in bankruptcy.

have made previously ineligible payments count toward forgiveness, loosened rules for public service workers, and provided faster forgiveness for low-balance borrowers. Additional forgiveness has come through borrower defense claims, which cancel loans for students whose schools engaged in misconduct, as well as through expanded Total and Permanent Disability (TPD) discharge which allow permanently disabled borrowers to receive some forgiveness.[8]

As a result of rising student debt and the perceived burdens, calls for student loan forgiveness have increased in the years preceding the 2020 U.S. Presidential election. For most borrowers, student loan forgiveness was a remote possibility before 2020 but during that election the policy came to the forefront. Each major Democratic candidate promised significant student loan relief. The 2020 pandemic was a watershed moment for student loan payment relief. Most immediately, student loan payments and interest were paused as part of bipartisan pandemic relief package in early 2020, resulting in automatic rehabilitation of federal loans in default.[9] The payment pause was then extended on seven separate occasions: Student loans were initially paused as part of the CARES Act, effective March 27, 2020, through September 2020.[10] In the end, the initially temporary payment moratorium lasted 3.5 years until October 2023.[11] The extensions after August 2022 were in part motivated by developments related to student loan forgiveness, which we discuss next.

In August 2022, the Biden administration proposed broad-based cancellation of student debt in line with a key campaign promise. Under the plan recipients of Pell grants, which are

[8]Altogether, across IDR-related adjustments, PSLF improvements, borrower defense, and TPD discharges, roughly 3 million borrowers have received over $133 billion in loan forgiveness. This event is studied in Dinerstein, Earnest, Koustas, and Yannelis (2024).

[9]FFEL loans did not qualify for the repayment pause (Dinerstein, Yannelis, and Chen, 2024).

[10]This was later extended (twice) through September 2021. In August 2021, the payment pause was extended through January 2022. In January 2022, the payment pause was extended through May 2022. In April 2022, the payment pause was extended through August 2022. In August 2022, the payment pause was extended to January 2023. The press release referred to this extension as the "final time" that this policy would be extended. Despite this, in November 2022, the payment pause was extended to June 2023. In June 2023, the payment pause was extended again through September 2023.

[11]While interest was beginning to accrue again, the Biden administration also announced that there would be no other consequences for non-payment for the next year, including no reporting of a delinquency to credit bureaus. In October 2024, payments paused again for individuals who had enrolled in the new, more generous income-contingent repayment plans, known as SAVE plans. Enrolling in these plans would also later be blocked by the courts.

federal grants given to students from low-income household, could receive a higher amount of $20,000. Other borrowers would receive $10,000 in loan forgiveness. This proposed plan for forgiveness had an income threshold of $125,000 per year for singles, and $250,000 for married couples. Initially justified under legal authority granted to the federak government to forgive loans during national emergencies, the policy soon encountered political opposition and legal challenges. On November 14, 2022, court injunctions blocked new applications for forgiveness. Following the date, prospective borrowers seeking to apply for forgiveness visiting studentaid.gov saw a banner that read: "*Courts have issued orders blocking our student debt relief program. As a result, at this time, we are not accepting applications. We are seeking to overturn those orders. If you've already applied, we'll hold your application.*" Ultimately, a Supreme Court decision on June 30, 2023 blocked the order, and no broad-based forgiveness was issued under this plan.[12]

During this time, the proposed policies and legal battles received significant media attention. We visualize this media attention in Figure 1. The figure shows the number of news articles in major news outlets related to student loan forgiveness, over the period from 2019 to 2024. We further classify those articles into "Optimistic," "Neutral" and "Pessimistic" regarding the likelihood of forgiveness using Chat GPT 3.5 turbo. The number of articles peaks around the August 2023 announcement related to broad-based student loan forgiveness. As the figure shows, there is significant heterogeneity in the media's forecasts regarding the likelihood loan forgiveness. Throughout the window studied in Figure 1, there is a mix of optimistic and pessimistic information, which is also shown in the future. During this time additional political statements, forgiveness made under other legal authority,, and the introduction of new income-driven repayment plans that can lead to forgiveness, have also occurred. Given the popular media and policy attention, many beliefs about forgiveness likely changed dramatically since 2020. We

[12]There were two separate court cases filed to block loan forgiveness, which had alternative outcomes highlighting the significant uncertainty regarding outcomes during this time period. One case was unsuccessful due to reasons of standing, while the second case Biden vs. Nebraska was successful in stopping implementation of loan discharge. The court argued that legislation, which was initially intended for war veterans who held federal loans, did not allow the executive branch to discharge government loans.

next discuss our novel survey and the link to spending, credit bureau and employment data.

3 Surveying Beliefs about Student Loan Forgiveness

3.1 Survey Design

The key goal of our survey was to elicit individual beliefs about student loan forgiveness and repayment that we could link to economic outcomes.[13] We asked the following series of questions to borrowers to elicit beliefs: First, "*What is the percent chance AT LEAST SOME of your student loan debt will be forgiven in the next [1,2-5,10] years?*" We then asked "*What fraction of your student debt do you think will be forgiven in the next [1,2-5,10] years?*" We also explicitly asked, "*What dollar value of your student loan debt do you think will be forgiven?*" Using a related question, we elicit expectations related to the payment moratorium: "*What is the percent chance the repayment pause will be extended past [DATE LAST ANNOUNCED].*" The survey also included a randomized treatment showing optimistic and pessimistic news articles about forgiveness. The goal of this treatment was to shift beliefs about the likelihood of forgiveness, which was successful. We report these information treatments in Appendix B.

We fielded our survey using two different samples, which we can respectively link to credit panel and consumption data. The first was a survey frame purchased through an anonymous credit bureau, while the second was obtained through a commercial consumption survey. The credit panel sample frame consisted of 1.3 million emails of potential student loan borrowers. These emails were sourced by the credit bureau by looking at nine-digit zipcodes with high rates of student loan borrowers. Using this survey frame, we conducted a series of email surveys using Qualtrics. In May-June 2022, we piloted the survey, providing lottery prize compensation. We conducted our first main survey waves from June to August 2022, using approximately half of our non-Gmail sample frame.[14] Prior to the Supreme Court decision,

[13] A copy of our main survey instrument is provided in Online Appendix D. IRB approval to conduct our survey for was given at The University of Chicago under Protocol IRB22-0465.

[14] We did not find that response rates were sensitive to providing an incentive. We found substantially lower

we reached out to the remaining sample beginning in April 2023, as well as to resurvey prior respondents. In the end we received 8,417 completed responses from 4,847 unique respondents, which corresponds to a 1.2 percent among non-Gmail email accounts.

Separately, we conducted our survey in The Numerator OmniPanel. Numerator is a company which specializes in generating high quality consumption data and consumer insights. The panel is comprised of consumers using the Receipt Hog app.[15] Our survey responses are then linkable to high-frequency spending data derived from receipts scanned by consumers into the Receipt Hog app; we discuss the Numerator data in more detail in Section 4 below. One survey wave was conducted in July 2023 targeting 3,000 respondents who indicated in a screening question that they had current student loans. In the end, we received 3,024 completed responses in our Numerator panel.

3.2 Raw Survey Results

3.2.1 Beliefs about Forgiveness and Repayment

We now briefly describe key survey results. Additional results from our survey can be found in Appendix C. First, announcements surrounding student loans are highly salient among our respondents. In terms of repayment activity, 91 percent of respondents reported they were aware of the repayment pause, and 71 percent reported not having made a student loan payment since March 2020. Additionally, 18 percent reported making a voluntary payment, while 10 percent reported not having eligible student loans and only 1 percent said “Didn’t know." Following the August 24 forgiveness announcement, 88 percent reported awareness of the forgiveness plan. In our surveying in Spring 2023, 86 percent reported being aware that the Supreme Court might block forgiveness.

We plot the time series of our 1-year ahead forgiveness expectations across all our survey

response rates among individuals with Google-based email addresses which we believe is due to the way the Google email server handles large volume messages being sent via Qualtrics. Approximately 60 percent of our sample frame emails were a non-Gmail address.

[15] More information about the Numerator panel can be found at https://www.numerator.com/omnipanels/

waves in Figure 2. Our first surveys in June 2022 show mean beliefs around 27 percent. Mean beliefs jump by approximately 20 percentage points at the August 24 announcement, but were still below 50 percent. In a post announcement follow-up question, we asked about sources of skepticism. Approximately half indicated skepticism about legality, while around one-third indicated uncertainty about individual eligibility, such as income and eligible loan types. By the time of the Supreme Court decision, average beliefs were around 5 p.p. below their pre-announcement mean, but still reasonably high at 22 percent.[16]

We next turn to analyzing the distribution of these beliefs. We plot the full distribution of cross-sectional beliefs pre and post the two major announcements in Figure 3.[17] We see considerable variation in beliefs, with mass points at 0, 50 and 100 percent. Appendix Figure A.3 reports the distribution of the fraction of student loans individuals expected to be forgiven at the different horizons, restricted to those with positive beliefs about forgiveness. The median fraction at the 1-year horizon was 27 percent. Only 10 percent of respondents expect all their loans to be forgiven over the course of the next 5 years. Interestingly, beliefs about receiving 100 percent forgiveness nearly double from 10 to 20 percent of respondents between the 2-5 and 10-year horizons. In Figure 4, we show similar plots for beliefs about the repayment pause. Prior to the penultimate extension of the repayment pause, around half of respondents expected the payment pauses to continue. Prior to the final pause, beliefs had fallen considerably; however, 30 percent of respondents still expected a further extension that did not materialize.

3.2.2 Survey Intentions

In our surveys in 2023, we also asked about consumption and employment intentions if respondents received forgiveness. In particular, our question asked households to consider: "Suppose you received student loan forgiveness of $10,000." We then prompted households to indicate how much of the $10,000 they would allocate to new spending, such as a house/apartment; a car or

[16] Ineed, some individuals ended up receiving forgiveness through Public Service Loan Forgiveness, Incomde Driven Repayment, and Borrower Defense Programs.

[17] The time series of the standard deviation (SD) is provided in Figure A.2. The SD grows after the August 2022 announcement, but then comes back down and remains relatively constant throughout the period at around 0.3.

other vehicle; a large home appliance or electronics; or all other spending. We also asked about paying off other debts or saving. To briefly summarize the results, 15.5% reported they would allocate money to new spending on housing, 14.7% reported they would allocate money to new vehicle spending, 8.4% reported they would allocate money to a large appliance/electronics, and 19% reported increasing other spending.

In Appendix A.1, we run a regression of consumption survey intentions, on 1-year ahead forgiveness beliefs and indicators for low levels of savings, as reported by respondents. Survey intentions for housing and autos fall with liquidity, pointing to liquidity constraints as one possible driver for consumption responses upon realization of forgiveness (Weidner, Kaplan, and Violante, 2014). Even after controlling for liquidity, the magnitudes of the responses increase with optimism, particularly for housing and cars. We do not see the same relationships for smaller durables or other spending.[18] This provides suggestive evidence that those with more optimistic beliefs may be holding back on large durable purchases in particular until forgiveness is realized, a point we will return to in our main analysis.

4 Data Linkages

This section describes linkages between our survey and credit bureau, employment and spending data.

4.1 Anonymous Credit Bureau

4.1.1 Data Linkage

We sent completed survey responses to our credit bureau partners via secure transfer.[19] The credit bureau then conducted linkages using email addresses as the identifier. The linked

[18] To understand employment intentions, we asked if households would change jobs, increase/decrease hours, or change their job search intensity. The survey also asked about intentions about work hours and job search. Few respondents reported that they would reduce hours if they achieved forgiveness.

[19] Due to legal limitations, including data sharing agreements, we cannot disclose the name of the specific credit bureau from which the consumer credit data was obtained for this analysis.

data were anonymized by the credit bureau before being made available to us for analytical purposes. Because the survey frame was also sourced from the credit bureau, the match rate is high (>90 percent). We also linked a random sample of 100,000 non-respondents from the survey frame.[20] We have access to credit bureau outcomes from these credit bureau records from 2013 to the present. These data include standard credit bureau outcomes such as payments, balances, loan inquiries and credit score (Vantage 4.0). Detailed demographic information on age, gender, and educational attainment are also available for >90 percent of our matched respondents, and around half of the credit bureau universe. For around one-third of our sample, we also have employment records. These data are collected for employment verification and income verification purposes, such as when applying for credit or seeking new employment.[21]

Appendix Table A.2 compares descriptive statistics between our respondents and non-respondents in the sample frame. Some differences arise. Notably, survey respondents have substantially higher student loan balances. The average (median) balance of respondents is $73,100 ($50,800) compared to $49,300 ($29,400) among the full sample frame. One explanation for the higher balances among respondents may be that respondents have greater benefits to gathering information about forgiveness and as such participate in the survey (Maćkowiak, Matějka, and Wiederholt, 2023; Weber, Candia, Afrouzi, Ropele, Lluberas, Frache, Meyer, Kumar, Gorodnichenko, Georgarakos, et al., 2025). Differences in other outcomes are small in terms of their economic significance. Appendix Table A.2 also reports differences in employment between respondents and the same frame. Respondents are slightly more likely to have an employment match (1.8 percentage points), but have similar monthly earnings conditional on earnings.

[20] This includes the non-surveyed Gmail emails.

[21] Similar data are used in Gopalan, Hamilton, Kalda, and Sovich (2021) and Derenoncourt and Weil (2025). These data provide national coverage of employment history and monthly earnings from over 3 million employers, including government and non-profits, with around 50 million active records per month, which is just over 30 percent of total non-farm employment from the BLS establishment survey. Conditional on working full-year, we find that annual earnings closely compare to the CPS ASEC. Further details on coverage and comparisons to other employment and earnings data can be found in Dinerstein, Earnest, Koustas, and Yannelis (2024).

4.1.2 Sample Restrictions

We restrict the analysis to individuals who have student loans in the credit bureau data. One consequence of our sampling approach is that the person in the household who has student loans may be a different person than whose email we have in our sample frame. For instance, suppose we have the email of a parent who does not have student loans and we emailed this parent. It is possible they forwarded the survey to their child who has student loans. We would then link to the parents credit bureau file. We estimate this issue affects approximately 20 percent of respondents. Restricting to respondents who have student loans in the data effectively deals with this issue.

4.2 Non-Durable Spending (Numerator)

Our consumption data is obtained from Numerator, which directly linked our survey to their data. Numerator is a provider of consumer-sourced data. A panel of consumers voluntary scan receipts via a smartphone application and/or provides access to their email inbox, which Numerator then scans for receipts. Numerator then cleans and processes these receipts to record detailed item and store level information for every trip. These data therefore capture cash and debit transactions missing in credit bureau data. The time period of the data are from 2017 through June 2023.

5 How Do Households Respond to Beliefs about Forgiveness?

5.1 Descriptive Analysis

Our main focus will be on student loan repayment activity, which will mainly be from voluntary student loan payments in this period. As discussed above, 18 percent of our survey respondents reported making voluntary payments. Figure A.1 shows repayment activity over this period. While it is declining over time, around 5 percent of individuals are making payments in any

month without having a payment due.[22] Thus, student loan repayment decisions are likely an important choice borrowers can make in this period, and may be affected by beliefs about future forgiveness.

We begin by examining raw summary statistics at the time of the survey among our respondents in Table 1. We report summary statistics by above/below median 1-year ahead forgiveness beliefs at the time of the first survey, which is 19 percent. Those with above and below median beliefs appear similar in terms of student loan balances. However, those with more optimistic beliefs are less likely to make payments and make smaller payments. Those who are more optimistic are on average one year older, but are no more or less likely to be female.

Some of the differences in the raw summary statistics at the time of the survey may reflect differences in the date of the survey (we saw above that beliefs fluctuate over time) as well as other shocks occurring during this period. We next partially control for these differences by running the following specification:

$$y_i = \sum_{q=2}^{4} \beta_q \mathbf{1}\{\pi_i^1 \in \text{quartile } q\} + \delta' X_i + \epsilon_i \tag{2}$$

In this specification, we discretize 1-year ahead beliefs, π_i^1 into quartiles, and a vector of controls, X_i, for month surveyed, which include: state of residence, whether an individual made any student loan payments in 2019, had any mortgage in 2019, zipcode-level housing price changes between February 2020 and survey date, and county-level COVID cumulative mortality rates at survey date.

Figure 5, Panel a, plots the β_q coefficients, along with 90 and 95 percent confidence intervals, visualizing the relationship between student loan repayment outcomes and 1-year ahead forgiveness beliefs. We find student loan payment activity declines in beliefs about forgiveness, with households expecting forgiveness being less likely to make payment. We cannot reject 1-year

[22] Around 20 percent still have payments due, which is a combination of FFEL loans (Dinerstein, Yannelis, and Chen, 2024) and private loans. Even on these loans, borrowers may still have some scope to avoid payments, such as by filing for forbearance.

ahead beliefs in quartile 2 (4-18 percent beliefs about 1-year ahead forgiveness) are different from quartile 1 (0-3%) at the 5 percent level, although they do differ at the 10% level. Quartiles 3 and 4 (19 percent or more) are significantly different from quartile 1, but not from each other. The results suggest that beliefs about forgiveness affect repayment behavior.

We next examine the dynamics of outcomes by beliefs. To do so, we divide the sample into above and below median beliefs, and examine how outcomes evolve over each quarter. In particular, we run the following specification:

$$y_{i,t} = \sum_t \beta_t \mathbf{1}\{Optimist_i\} \times \mathbf{1}\{t \in yq\} + \delta' X_{i,t} + \text{group trends} + \epsilon_{i,t} \tag{3}$$

Where $Optimist_i$ is defined as $[\pi_i^1 \geq \text{quartile 3 }]$. We omit Q1 2020, so that results are relative to the month prior to the payment pause. The regression also includes controls for state time trends, survey wave time trends, in repayment in 2019 time trends, any mortgage in 2019 time trends, zipcode-level housing prices, and county-level cumulative COVID mortality.[23] Standard errors are clustered at the individual level.

Figure 5, Panel b, plots the β_t coefficients, along with 90 and 95 percent confidence intervals. We find that individuals who eventually have above-median beliefs start reducing payments on student loans in the quarters after the payment pause, and this effect grows over time. There us a rapid increase in late 2020 and early 2021, coinciding with the November 2020 Presidential election. During this electoral contest, student loan forgiveness was a significant electoral promise of the Biden campaign. Prior to the payment pause, no difference in repayment trends occurred between those we later measure to have above optimistic beliefs. Much of the level difference shown in panel (a) is accounted for in panel (b) in the period since Q1 2020. This pattern is consistent with news data seen in Figure 1. Immediately following the payment pause and the subsequent Presidential election is a period where news about forgiveness begins to disseminate. It is thus very likely that household beliefs we measure later are formed in the

[23] September 2022 is recoded in 2022:Q4 as the full month occurs post the August 24, 2022 forgiveness announcement.

quarters after the payment pause.

Estimates for a number of additional credit panel outcomes are provided in Appendices A.9 and A.10. The patterns indicate a reduction in mortgage and credit card balance for optimists after the Supreme Court decisions. This pattern is consistent with borrowers shifting funds to non-students loans if they believe that their student loans are going to be forgiven. The effects widen precisely in the period around the 2022 loan forgiveness announcement. We see little effect on employment outcomes or auto loan balances. Motivated by observed effects around policy announcements, we next explore reactions in more detail.

5.2 Reactions Around Policy Announcements

The previous analysis found that point-in-time forgiveness beliefs are correlated with repayment activity, and these differences appear beginning in 2020 as forgiveness became part of national discourse. We next focus on *changes* in beliefs, by examining the period around major announcements. To do so, we run event studies around the three key events that occur during our panel: (1) the initial forgiveness executive order made on August 24, 2022; (2) the Supreme Court decision blocking forgiveness made on June 30, 2023; and (3) the resumption of payments in November 2023. We stratify by prior beliefs about forgiveness, comparing those with above and below median beliefs. Predictions and estimation differ slightly for each event. We discuss each event and the results in turn.

5.2.1 Forgiveness Announcement

On August 22, 2022, President Biden through executive action announced $10,000 in forgiveness for most borrowers. This announcement is therefore primarily a shock to those who were pessimistic about forgiveness prior to the announcement. We have two key predictions relating to debt prepayment and spending. First, pessimists with less than $10,000 in balances should no longer want to make voluntary payments, while those with higher balances may still want to make payments as these were not subject to the order. Second, pessimists will increase

spending in response to an increase in expected wealth.

To test these hypotheses, we consider the following event-study specification:

$$y_{i,t} = \sum \beta_k \mathbb{1}\{t \in k\} \times \mathbb{1}\{Pessimist^{pre}\} + \sum \delta_k \mathbb{1}\{t \in k\} \times \mathbb{1}\{Balance^{pre} < \$10k\} + \sum \gamma_k \mathbb{1}\{t \in k\} \times \mathbb{1}\{Pessimist^{pre}\} \times \mathbb{1}\{Balance^{pre} < \$10k\} + \alpha_i + \alpha_t + \epsilon_{i,t} \quad (4)$$

where $Pessimist^{pre}$ is an indicator for below median beliefs, defined in surveys prior to the announcement, and $\mathbb{1}\{Balance^{pre} < \$10k\}$ is an indicator for having pre-announcement balances of \$10,000 or less.

The key event coefficients are plotted in the top row of Figure 6. Panel (a) reports the main γ_k coefficients of interest for pessimists with balances under \$10,000. Panel (b) reports the β_k coefficients, showing effects for pessimists with larger balances relative to optimists with larger balances. Results from a more parsimonious specification pooling the event study coefficients are reported in Table 2. The first column in Table 2 reports the change in beliefs among the subset of respondents with a second belief observation post announcement in the event window.[24] On average, beliefs about 1-year ahead forgiveness increase 20 percentage points among pessimists compared to optimists. There is no statistically significant difference in the change in beliefs among pessimists with balances below \$10,000. Columns (2)-(4) report changes in student loan repayment activity and balances. We find that pessimists with balances under \$10,000 reduce the probability of making a payment by about 7.7 percentage points and make \$40 fewer in payments in the post period, on average. As also evident in panel (b), there is no significant response among pessimists with balances above \$10,000.

Figure 7 and Table 3 report results on spending in the Numerator data. We find that pessimists with lower balances increase non-durable spending by approximately \$100 per month. While this point estimate is greater than the monthly cash flow savings, both estimates are noisy and we cannot reject equality. The spending results are driven by non-food expenditure,

[24] We do not run a regression on changes in beliefs given we only have post-period beliefs for about 10 percent of respondents).

suggesting that the increase in spending may come from more discretionary spending categories.

We report additional results in Table A.3a. In contrast to Numerator consumption, which largely captures non-durable and semi-durable spending, low balance pessimists appear to *reduce* spending on autos, with about $2,600 lower spending in the post period. Similar to trends in housing we saw in the lower-frequency analysis above, one explanation could be that households are using savings from student loan payments to pay down other debts.

5.2.2 Supreme Court Decision

On June 30, 2023, following legal challenges the Supreme Court blocked the broad-based forgiveness plan. This event is thus a shock to those who were optimistic about forgiveness in the period prior to the announcement. We consider a similar event-study framework, this time comparing the response of optimists relative to pessimists:

$$y_{i,t} = \sum \beta_k \mathbb{1}\{t \in k\} \times \mathbb{1}\{Optimist^{pre}\} + \delta_k \mathbb{1}\{t \in k\} \times \mathbb{1}\{Balance^{pre} < \$10k\} + \sum \gamma_k \mathbb{1}\{t \in k\} \times \mathbb{1}\{Optimist^{pre}\} \times \mathbb{1}\{Balance^{pre} < \$10k\} + \alpha_i + \alpha_t + \epsilon_{i,t} \quad (5)$$

where $Optimist^{pre}$ is now an indicator for above-median beliefs, and is defined in surveys post announcement but prior to the Supreme Court decision. For this analysis, we restrict the sample to those who were surveyed after the injunctions in November 2022 and prior to the Supreme Court decision.

Event study coefficients are plotted in the bottom row of Figure 6, and results from a more parsimonious specification pooling the event study coefficients are shown in Table 2. Column (1) of the table shows that beliefs of optimists fell by 27 percentage points, which is comparable in magnitude to the size of the shock around the announcement. The dynamics in the figure are noisier, but the point estimate for student loan payments for those with balances under $10,000 is positive and comparable to what we saw for the forgiveness announcement. The largest point estimate is the last month in the event window, October 2023, which is when

interest again begins to accrue.

5.2.3 Resumption of Payments Due

The final event we consider is the resumption of student loan payments in October 2023 after 3.5 years of the payment pause. Appendix Figure A.1 shows that the share making payments doubled around this time, from around 20 percent to 50 percent of student loan borrowers. This is a shock to individuals who believe that the payment pause will be extended further, and who are faced with an unanticipated liquidity shock.

To separate out beliefs about future forgiveness from beliefs about the repayment pause, our event study specification examines these beliefs separately:

$$y_{i,t} = \sum \beta_k \mathbb{1}\{t \in k\} \times \mathbb{1}\{OptimistRepayment^{Pre}\} + \sum \delta_k \mathbb{1}\{t \in k\} \times \mathbb{1}\{OptimistForgiveness^{Pre}\} + \gamma_i + \gamma_t + \epsilon_{i,t} \quad (6)$$

where $OptimistRepayment^{pre}$ and $OptimistForgiveness^{pre}$ are indicators for above median beliefs about the repayment pause and forgiveness, respectively. For this analysis, we restrict our sample to those who were surveyed in July 2023 post-announcement, and prior to the repayment pause ending.

Key event study coefficients are plotted in Figure 8, and results are reported from a more parsimonious specification pooling post periods in Table 4. We find that those who are most optimistic about the repayment pause being extended are less likely to make payments (hence more likely to accrue interest). We find no change in behavior for those optimistic about future forgiveness only. Additional outcomes are shown in Appendix Table A.4. We see some evidence that optimists shrink their mortgage balances. This may be because they have more cash flow to make payments on their mortgage since they are making fewer student loan payments.

5.3 Experimental Variation

A potential concern is that beliefs are correlated with unobserved factors, which either also change during policy announcements, or which are heterogeneously impacted by policy announcements. To address this concern, we experimentally vary beliefs about the likelihood of loan forgiveness. As part of our survey, we conducted a series of information treatments. Over the course of our surveying, we presented three sets of optimistic and pessimistic articles: pre- 8/22 Announcement (June-Aug 2022), post injunction (Nov 2022), and pre- Supreme Court decision (April-June 2023).

The articles used as treatments come from major newspapers such as *The Wall Street Journal* or *The New York Times*, and discuss either the determination of the Biden administration to press ahead with loan forgiveness, or various legal challenges that loan forgivenss with face. The text of the treatments are shown in Appendix B. Each survey wave randomly assigned respondents to receive an article or to the control group with no article, with 1/3 probability. Some respondents who were resurveyed prior to the Supreme Court decision were treated twice, with both treatments being independent. In Appendix Table B.4, we report a balance table comparing observables between our two treatments and control groups, for the first treatment. The p-values on the F-statistic for the optimistic and pessimistic treatments are 0.942 and 0.567 respectively, indicating that the randomization was successful.

Our first stage regression is shown in Table 5. We find that the optimistic treatment increased beliefs by around 3.7 percentage points, but find no effect of the pessimistic treatments.[25] The F-statistic is strong, at 17.32 and above conventional rule of thumbs for a weak instrument. We proceed focusing on the optimistic treatment, and pooling the pessimistic treatment with the control group. We next examine the effect of our optimistic treatment on outcomes by running

[25]This asymmetry is potentially consistent with "motivated beliefs," a theory from behavioral psychology literature which documents a tendency to down-weight negative information. Our event study around the Supreme Court decision did show beliefs fell dramatically, so it could be that people respond differently to pessimistic information that is more uncertain.

separate rolling IV regression around the survey date:

$$y_{it}^{h} = \beta_{IV}^{h} \widehat{\pi^{1}} + \delta^{h} X_i + \epsilon_{it}^{h}$$
$$\pi_{it}^{1} = b_1 \mathbb{1}\{Optimistic\} + d' X_i + u_{it}$$

where h denotes the time in relation to the survey date; $h = 0$ is the date of the survey, and $h < 0$ are placebo regressions prior to the date of the survey. $\mathbb{1}\{Optimistic\}$ is an indicator of having a treatment that is opmistic regarding loan forgiveness.

The β_{IV} coefficients of making any student loan payment are plotted in Figure 9. Reassuringly, the placebo periods prior to the survey all show zero effects, which are both statistically indistinguishable from zero and very close in terms of magnitudes. Following our information intervention providing the optimistic treatment, student loan payments appear to begin falling in the treatment group. Figure 9 shows a statistically significant reduction in payments following the treatment.

To maximize statistical power, we pool the post outcomes in an IV event-study framework:

$$y_{it} = \beta_{IV} \widehat{\pi^{h} \times \mathbb{1}\{Post\}} + \beta_2 \mathbb{1}\{Post\} + \alpha_i + \alpha_t + \epsilon_{it}$$
$$\pi_{it}^{h} \times \mathbb{1}\{Post\} = b_1 \mathbb{1}\{Optimistic\} \times \mathbb{1}\{Post\} + b_2 \mathbb{1}\{Post\} + a_i + a_t + u_{it} \quad (7)$$

where $\mathbb{1}\{Post\}$ is a post survey indicator. We exclude the treatment month due to partial treatment, and pool 4 periods pre and post to increase power. Standard errors are clustered at the individual level. Results are reported in Table 6. We find that a 10 p.p. increase in beliefs reduced the payment propensity by 3.72 percentage points. Results on monthly payments are negative, consistent with our earlier results, but less precisely estimated.[26]

Our results also provide some evidence that projected loan forgiveness led to changes in the intention of vote. In the first wave of our survey, we also asked about intentions to vote in the November 2022 midterm elections. Results from the IV regression are reported in Column

[26]Results for other credit bureau and employment outcomes are reported in Table A.5. However, results for these outcomes are not precisely estimated.

(4) of Table 6. Interestingly, we find that increasing forgiveness beliefs via our optimistic treatments increased voting intentions: A 10 percentage point increase in forgiveness beliefs increases propensity to vote by 11.4 percentage points. Among our respondents, 58 percent reported intending to vote for the Democratic party.

6 Welfare Quantification

In this section we extend the very simple stylized model presented in section 2 to illustrate how beliefs affect repayment choice and how corresponding uncertainty impacts borrower welfare. We use the model to quantify the welfare consequences of inaccurate beliefs, and show how government sending distorted signals about future policy actions can lead to substantial welfare losses.

6.1 Model Setup

As in our empirical setting, we take debt as given and assume that a household starts life with debt, B_0, subject to interest rate r_b. There is uncertainty about some future debt forgiveness amount F, which occurs at some future point in time $T_F \leq T$, where T is the terminal period. We assume that the household can afford to pay off this loan based on their lifetime income, and per period income is always greater than the amortized payment:

$$y_t > B_0 \frac{r_b(1+r_b)^\tau}{(1+r_b)^\tau - 1}, \ \ \forall t \leq \tau. \tag{8}$$

where τ is the term of the loan. The household can also borrow and save at an interest rate r_s.

The household problem is to choose consumption and a repayment plan $\mathbf{b} = \{b_1, b_2, ..., b_\tau\}$

to maximize expected lifetime utility:[27]

$$\max_{c_t} \sum_{t=1}^{T} \beta^{t-1} \mathbb{E}_t\big[u(c_t)\big] \tag{9}$$

where u is assumed to be a twice-differentiable and concave function and β is a discount rate. Agents are subject to the lifetime budget constraint under which income less loan payments must equal consumption:

$$\sum_{t=1}^{T} (1+r_s)^{T-t}(y_t - \widetilde{b}_t) = \sum_{t=1}^{T} (1+r_s)^{T-t} c_t. \tag{10}$$

Loan payments b_t depend on potential forgiveness F, which occurs at time T_f. If forgiveness does not occur, households continue to pay b_t until τ. If households receive forgiveness, payments are paid until the remaining principal is eliminated (which may be the current period if the full balance is forgiven), after which no further payments are made.

We denote the discounted value of all repayments as $B := \sum_{t=1}^{T} (1+r_s)^{T-t} \widetilde{b}_t$. It then follows from the Euler equations and budget constraint that:

$$\frac{dc_t^*}{dB} < 0, \ \ \forall t. \tag{11}$$

Hence, the household is better off under a repayment plan with lower B. The optimal consumption decision comes down to the optimal term choice, τ. When choosing the optimal repayment plan, the household takes into account both the interest rate on the loan and their expectation of forgiveness. If a borrower expects forgiveness, he or she will defer repaying the loan, whereas if the borrower does not expect forgiveness, the optimal term choice minimizes the discounted value of payments.

[27] The model assumes rational expectations, but we do not take a stance on whether the beliefs are fully rational. Further, we do not consider behavioral biases (e.g. debt aversion, default biases), which may amplify or dampen existing forces in our model.

6.2 Calibration

We calibrate a numerical solution to our stylized model under various beliefs. Appendix E describes the solution method in more detail. We set the following parameters for our baseline calibration: a 25-year planning horizon ($T = 25$). We assume a standard coefficient of relative risk aversion (CRRA) utility with CRRA parameter $\rho = 2$, and annual discount factor $\beta = 0.96$. Following what we see in the employment data, after-tax income is assumed to be \$56,329 per year. We assume no income uncertainty for simplicity. The loan amount B_0 is set at \$50,000, which is the median among our respondents. In terms of the loan parameters, we assume households have a choice between a 10 (τ=10) or 20 year repayment term (τ=20). As described above, the optimal repayment choice is the choice that maximizes the discounted value of lifetime utility.

In our baseline calibration, we set r_s to 5 percent and r_b to 6.5 percent. This borrowing rate results in an amortized annual payment of \$6,955 if there was no payment pause. In the model, $r_b > r_s$ provides the main incentive to choose the 10-year repayment term. On top of this setup, we assume a three-year payment pause at 0 interest in the first three years. While in reality the end of the payment pause was not directly known, we assume no uncertainty in the end date of the repayment pause. We also assume reamortization occurs at the end of the repayment pause.

6.3 Model Result

We begin by describing model results in Table 6. Each cell in the Table answers the question: "What constant percent of consumption under (ex-post) correct beliefs would I need to give up to be indifferent between the indicated belief?" Thus, each cell essentially reports the welfare consequences, as a percent of consumption, of having incorrect beliefs. Columns (1)-(3) compare differences to correct beliefs within a payment plan choice (10-year or 20-year), and Columns (4)-(5) consider welfare losses relative to the optimal term choice under correct

beliefs.

The first three columns of Table 6 indicate that, if forgiveness does actually occur, the welfare consequences of mistaken beliefs are quite small within a repayment term choice. Column (1) considers the welfare losses under no forgiveness. Within a repayment plan, welfare losses from not having the optimal consumption path are modest, at most 0.09% of annual consumption (about $50 per year) for those who incorrectly assumed they would receive forgiveness. Columns (2) and (3) consider scenarios in which forgiveness actually does occur. Now, welfare losses occur only among pessimists about forgiveness. If we look at pessimists who chose a 10-year repayment plan, welfare losses are similar in magnitude to the optimists in Column (1). Note that there is no relative welfare loss for the 10-year repayment term. This is because the loan is paid off prior to the forgiveness realization for both optimists and pessimists.

In columns (4)-(5), welfare losses are now relative to choosing the optimal repayment plan that maximizes utility under ex-post correct beliefs. If forgiveness is certain, it is optimal to choose the 20-year term in order to make fewer payments on loans prior to forgiveness, while if forgiveness does not occur, it is optimal to pay down the loan within 10 years to avoid paying more in interest. Now using this counterfactual, welfare loses rise to 0.44 percent of consumption for those with 100% beliefs who selected the 20-year repayment plan, or around $235 dollars per year. The largest welfare losses occur among pessimists if forgiveness happens at the longer 10-year horizon. In wanting to avoid interest, pessimists about forgiveness will want have chosen to pay off their loans within 10 years. If forgiveness is realized, making more payments would be a costly mistake for those who had more modest beliefs, amounting to 2.79% of consumption, or around $1,500 per year.

Several other interesting results stand out. If forgiveness were to occur at the end of the payment pause after 3-years, the payment term choice is trivial matter since it is optimal to make no payments during the payment pause. If someone is not subject to the payment pause (e.g. if they had FFEL loans), or made voluntary payments during this time, such individuals

would have higher welfare losses if those payments were not rebated back. Second, having correct beliefs but choosing the wrong payment plan also generates sizable welfare losses, since having a 20-year payment term would require paying more interest over the lifetime of the loan relative to the optimal payment path.

Figure 10 considers the model results for the full set of beliefs and forgiveness realization horizons between years 4-10. Panel (a) shows the welfare losses if forgiveness does not occur, and panel (b) shows the welfare losses if forgiveness occurs. The main takeaways are as follows: as the expected horizon from forgiveness gets longer, borrowers will want to reduce payments by extending the term length of the loan, even under modest forgiveness beliefs. Upon realization, not receiving forgiveness generates welfare loses up to approximately 0.5% of lifetime consumption among optimists who were rationally choosing to make lower payments. The largest welfare losses occur in panel (b) among pessimists who paid off more of their loans, when forgiveness is realized further in the future.

Our modeling exercise, combined with the earlier empirical results, demonstrates that communication or actions leading to greater misperceptions can result in larger adjustments upon realization and greater welfare losses for borrowers. Further, these losses grow as the horizon under which uncertainty resolves extends further into the future.

7 Concluding Remarks

How households form, and act on, beliefs is important for many economic models which economists have noted at least since Ricardo (1821). Moreover, policymakers often send mixed or inaccurate signals regarding future policy actions, and these signals can affect agents' beliefs. Misperception created by policy ambiguity can have significant welfare consequences and affect the aggregate economy. This paper provides new evidence regarding how government policy shapes beliefs and actions in the context of student loan forgiveness.

We document wide variation in beliefs and provide new evidence on household consumption

and employment responses. We show that households with different beliefs have divergent debt repayment and consumption decisions, with heterogeneous responses to policy announcements. Our results have important implications for policymakers in terms of government communications. Ambiguous or incorrect policy communications can lead to suboptimal consumer behavior, leading to significant welfare consequences. While we study fiscal policy communication and beliefs in the context of loan forgiveness, similar effects may be present for taxes, tariffs, stimulus or other government fiscal policies. Studying these beliefs about future government fiscal policy, and whether there are similar or different effects, is potentially a fruitful avenue for future work.

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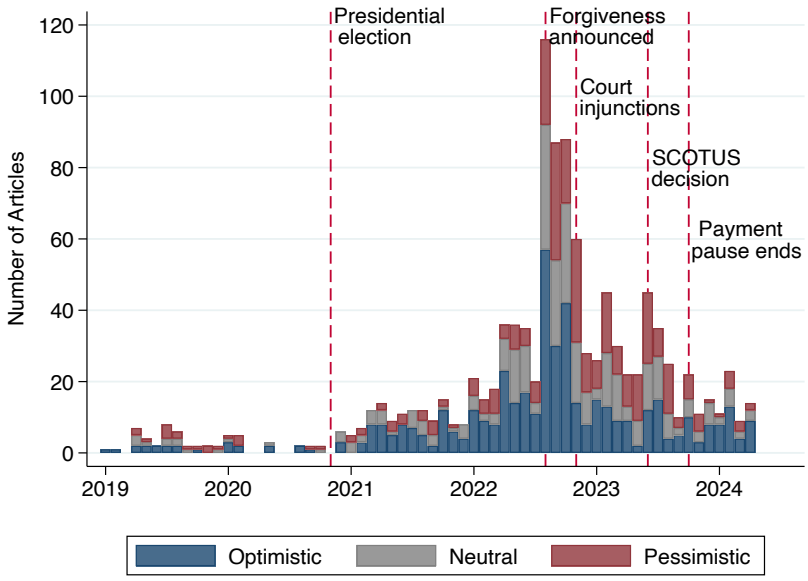
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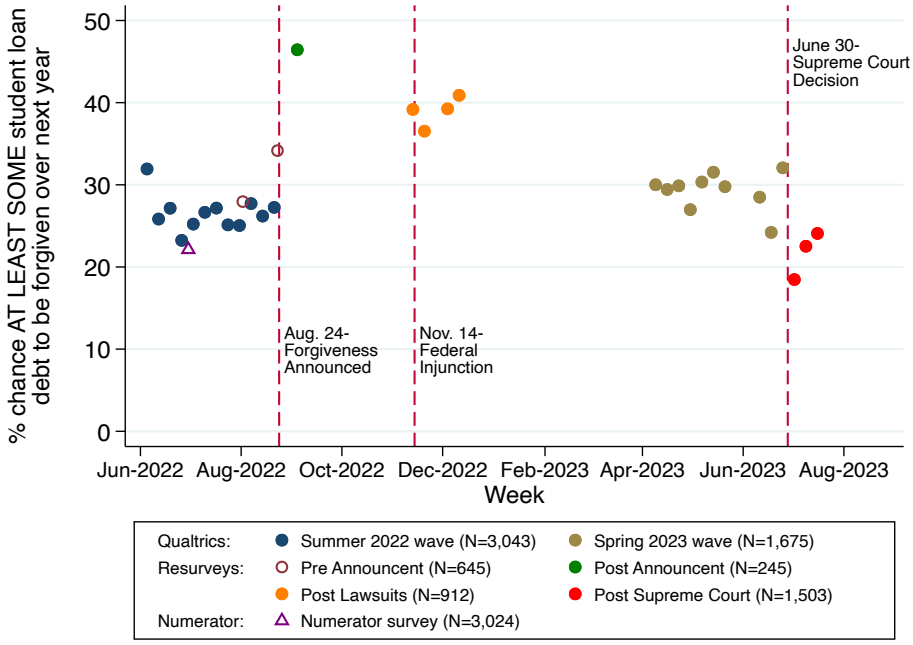
Figures

Figure 1: Key Dates Related to Student Loan Forgiveness and News Sentiment



Notes: Figure shows the number and sentiment about news articles from major news sources (Business Insider, Los Angeles Times, New York Times, The Washington Post, USA Today, and Wall Street Journal). Articles sourced from UChicago Proquest. Sentiment classified by Chat GPT 3.5 Turbo.

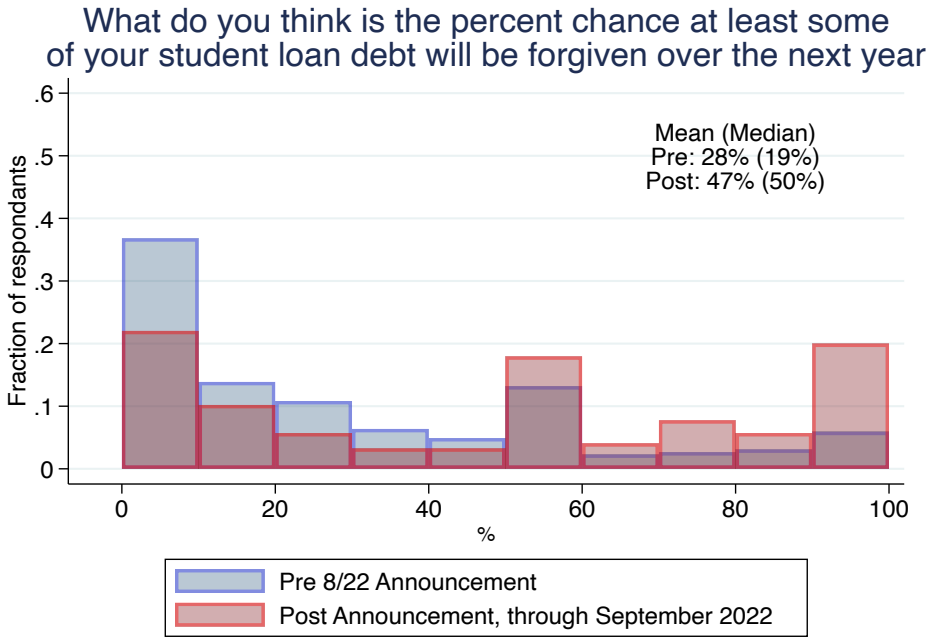
Figure 2: Survey Beliefs About 1-Year Ahead Forgiveness



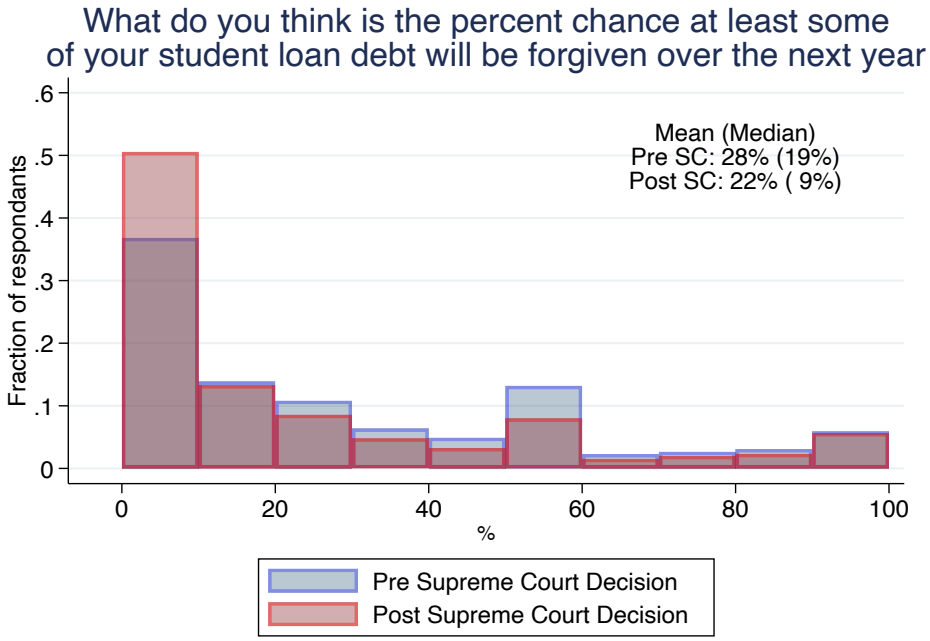
Notes: Figure shows mean beliefs about 1-year ahead forgiveness from our surveys.

Figure 3: Full Distribution of Beliefs, Pre and Post Major Policy Announcements

(a) Pre/Post 8/22 Executive Forgiveness Order



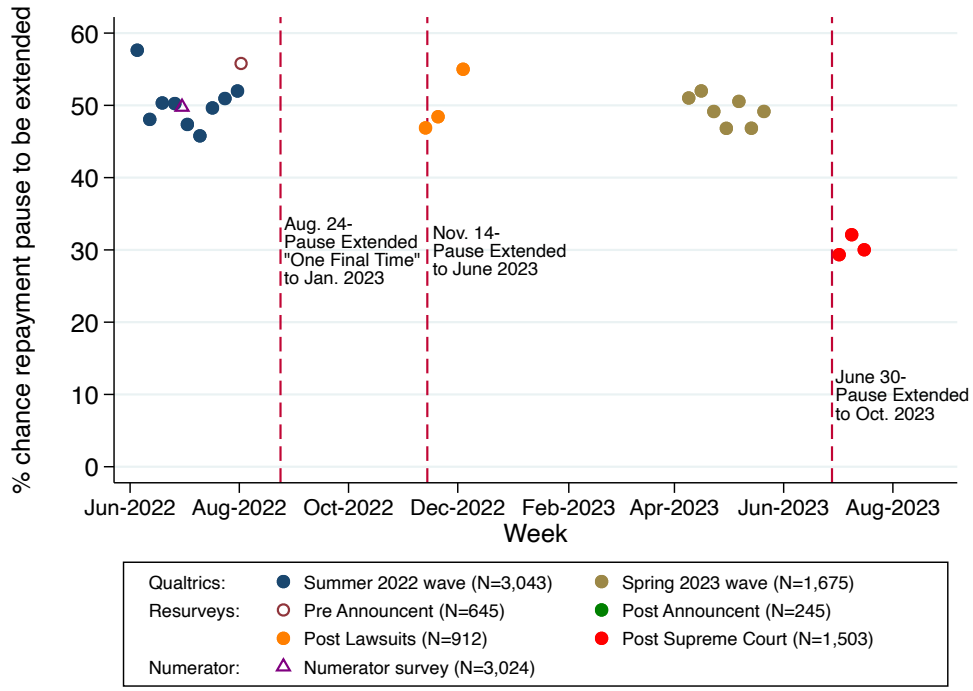
(b) Pre/Post 6/23 Supreme Court Decision



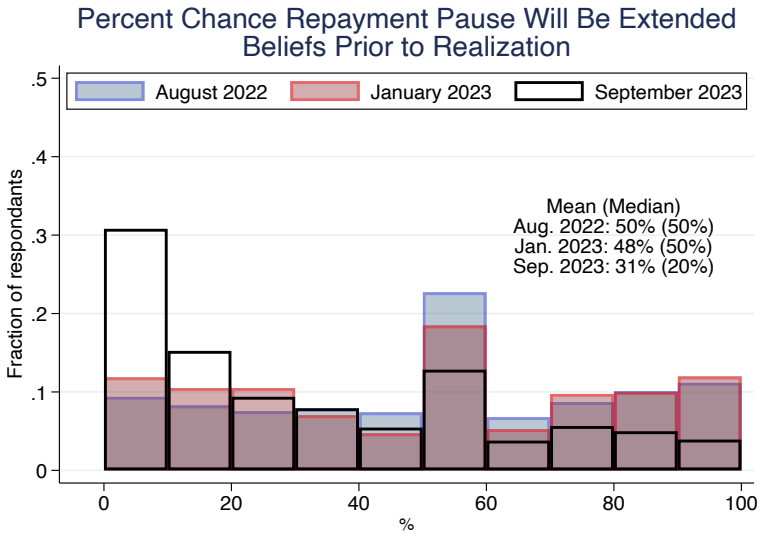
Notes: Figure shows the distribution of beliefs about 1-year ahead forgiveness. Panel (a) shows beliefs through September 2022. Panel (b) is restricted to beliefs collected after November 2022. Source: Qualtrics survey.

Figure 4: Expectations about the Resumption of Student Loan Payments

(a) Time-Series Means



(b) Pre/Post Supreme Court Decision

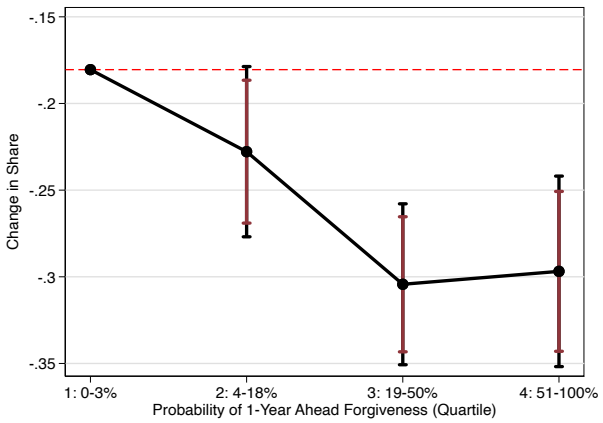


Notes: Figure shows beliefs about the repayment pause being extended past the previously announced end date. Panel (a) reports mean beliefs over time, and panel (b) plots the distribution of beliefs prior to three separate extensions observed in our sample period. Source: Qualtrics survey.

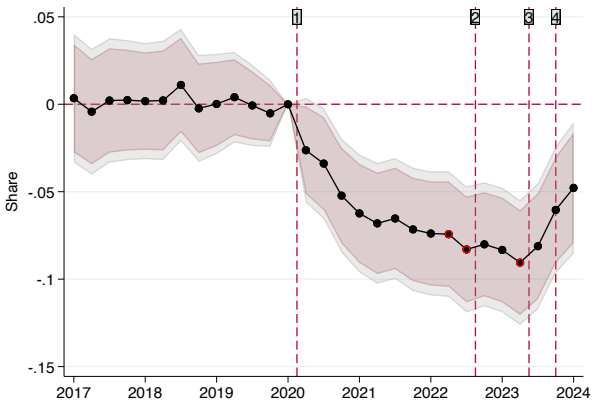
Figure 5: Evolution of Student Loan Payment Outcomes, By 1-Year-Ahead Forgiveness Beliefs

Any Student Loan Payment

(a) Change Since Feb 2020

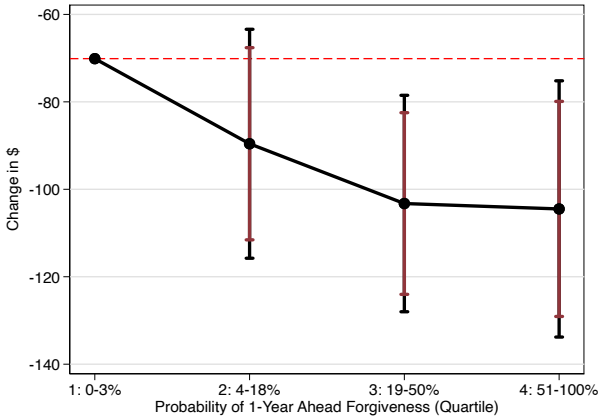


(b) Evolution, Above v. Below Median Beliefs

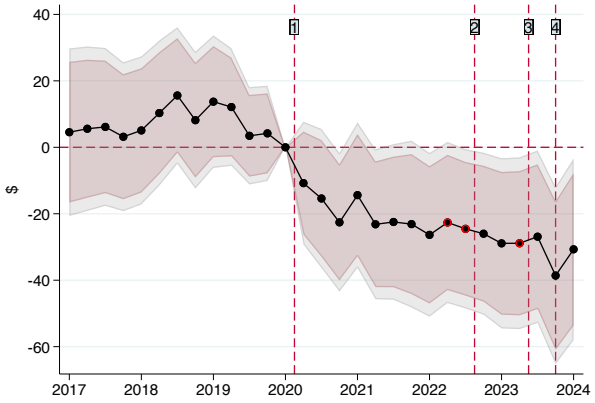


Monthly Student Loan Payment ($)

(c) Change Since Feb 2020



(d) Evolution, Above v. Below Median Beliefs

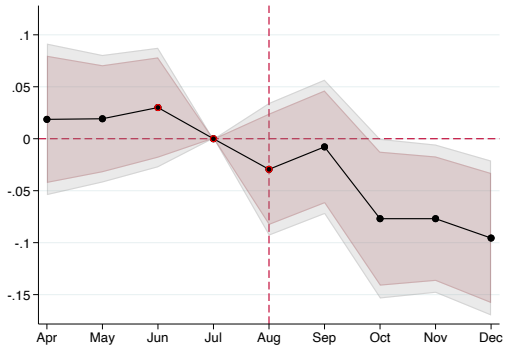


Notes: Left-hand panel reports the change in the given outcome at the time of first survey and Feb 2020, by quartiles of beliefs. Outcomes are regression adjusted to controls for month surveyed, state, whether an individual made any student loan payments in 2019, had any mortgage in 2019, zipcode-level housing price changes between February 2020 and survey date, and county-level COVID cumulative mortality rates at survey date. 95 (black) and 90 (maroon) percent confidence intervals are shown. Right-hand panel plots coefficients from a regression of quarterly time dummies interacted with an indicator of above-median one-year ahead forgiveness beliefs at time of survey. Coefficients are relative to 2020:Q1. Red circles denote main survey waves: June-Aug. 2022, and Apr.-June 2023. Regression also includes controls for state time trends, survey wave time trends, in repayment in 2019 time trends, any mortgage in 2019 time trends, zipcode-level housing prices, and county-level cumulative COVID mortality. September 2022 is recoded in 2022:Q4 as the full month occurs post the August 24, 2022 forgiveness announcement. Standard errors clustered at the individual level. Shading denotes 95 (gray) and 90 (maroon) percent confidence intervals. Key events indicated in vertical lines: (1) Payment pause begins (2) broad-based forgiveness announced (3) Supreme Court decision finds broad-based forgiveness unconsitutional (4) repayment begins.

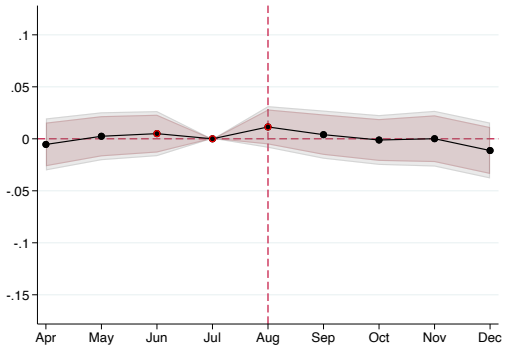
Figure 6: Any Student Loan Payment Around Major Forgiveness Announcements

August 2022 Forgiveness Announcement, Pessimists About Forgiveness Relative to Optimists

(a) Balances Under $10k

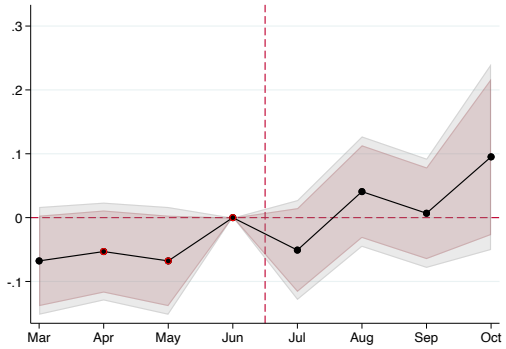


(b) Balances Over $10k

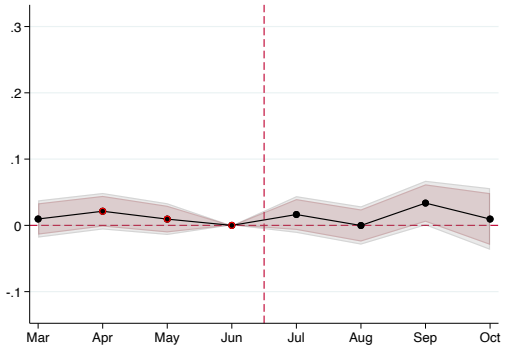


June 2023 Supreme Court Decision, Optimists About Forgiveness Relative to Pessimists

(c) Balances Under $10k



(d) Balances Over $10k



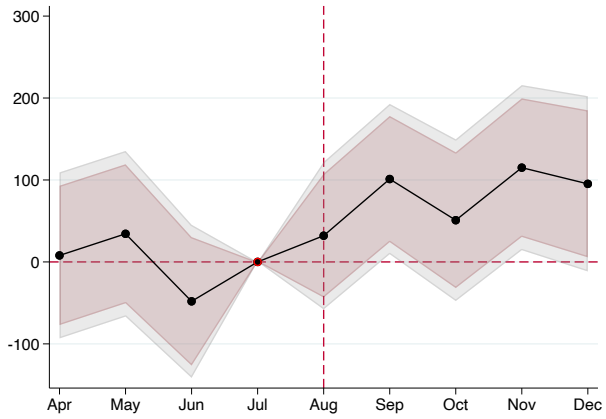
Notes: Figure plots β_k coefficents from estimating:

$$y_{i,t} = \sum \beta_k \mathbb{1}\{t \in k\} \times \mathbb{1}\{Beliefs^{pre}\} + \alpha_i + \alpha_t + \epsilon_{i,t}$$

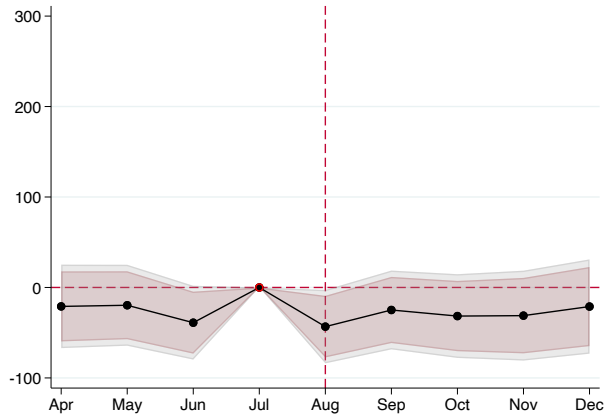
where $Beliefs^{pre}$ is either an indicator for having below-median 1-year ahead forgiveness beliefs prior to the August 2022 forgiveness announcement (top panel), or above-median beliefs prior to the Supreme Court decision (bottom panel). Left-hand panel shows results for borrowers with pre-period balances of $10,000 or less, and right-hand panel shows results for borrowers with pre-period balances greater than $10,000. Red dots indicate months beliefs were surveyed. Standard errors clustered at the individual level. Shading denotes 95 (gray) and 90 (maroon) percent confidence intervals. Source: Credit data.

Figure 7: Numerator Spending Around August 2022 Forgiveness Announcement, Pessimists About Forgiveness Relative to Optimists

(a) Balances Under $10k



(b) Balances Over $10k



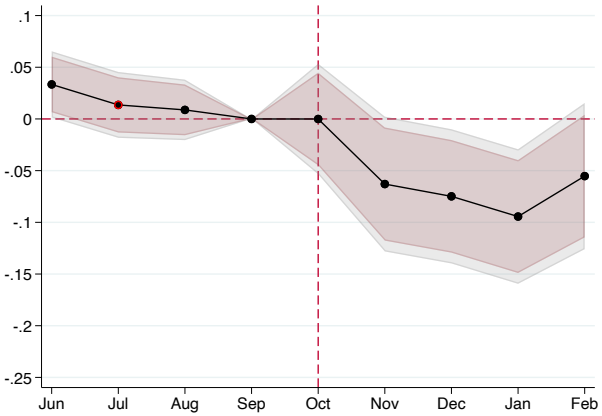
Notes: Figure plots β_k coefficents from estimating:

$$y_{i,t} = \sum \beta_k \mathbb{1}\{t \in k\} \times \mathbb{1}\{Beliefs^{pre}\} + \alpha_i + \alpha_t + \epsilon_{i,t}$$

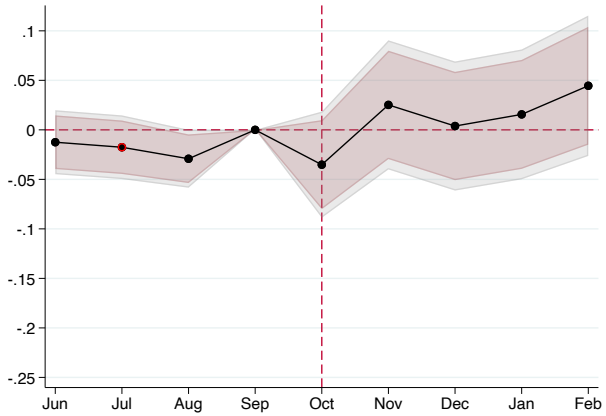
where $Beliefs^{pre}$ is an indicator for having below-median 1-year ahead forgiveness beliefs prior to the August 2022 forgiveness announcement. Left-hand panel shows results for borrowers with pre-period balances of $10,000 or less, and right-hand panel shows results for borrowers with pre-period balances greater than $10,000. Red dots indicate months beliefs were surveyed. Standard errors clustered at the individual level. Shading denotes 95 (gray) and 90 (maroon) percent confidence intervals. Source: Numerator data.

Figure 8: Any Student Loan Payment Around End of Payment Pause in October 2022, Optimists Relative to Pessimists

(a) Optimists about Payment Pause Extension



(b) Optimists about Forgiveness

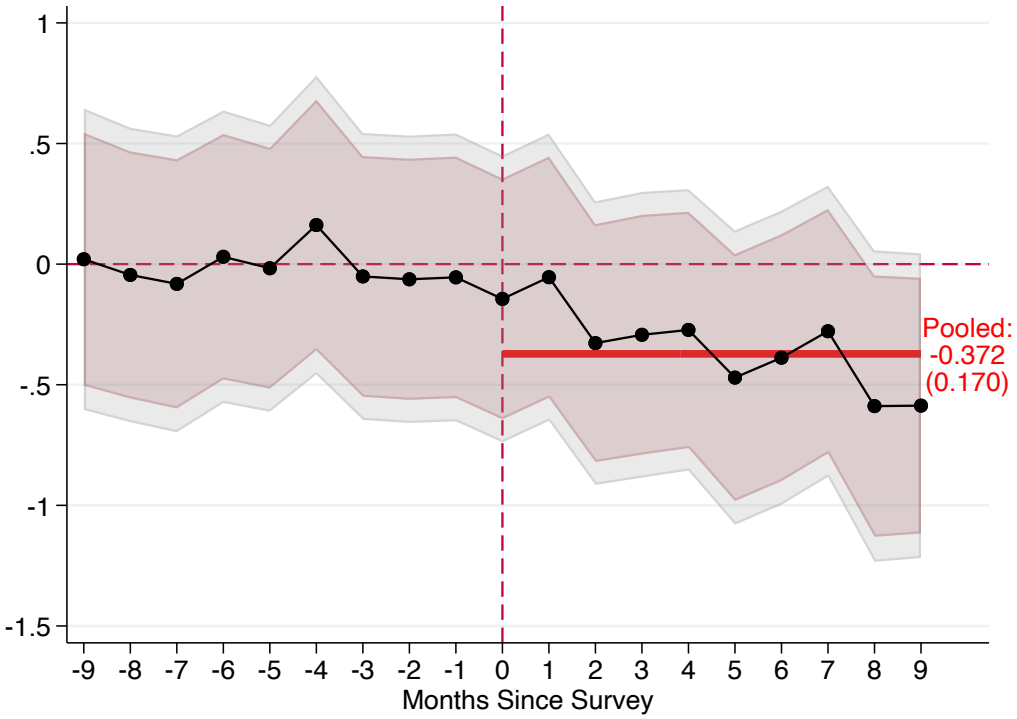


Notes: Figure plots β_k coefficents from estimating:

$$y_{i,t} = \sum \beta_k \mathbb{1}\{t \in k\} \times \mathbb{1}\{BeliefsRepayment^{Pre}\} +$$
$$\sum \delta_k \mathbb{1}\{t \in k\} \times \mathbb{1}\{BeliefsForgiveness^{Pre}\} + \gamma_i + \gamma_t + \epsilon_{i,t}$$

where: $BeliefsRepayment^{pre}$ and $BeliefsForgiveness^{pre}$ are indicators for above median beliefs about the repayment pause being extended beyond October 2023, and about 1-year ahead forgiveness, respectively. Red dots indicate months beliefs were surveyed. Standard errors clustered at the individual level. Shading denotes 95 (gray) and 90 (maroon) percent confidence intervals. Source: credit data.

Figure 9: Any Student Loan Payment and Beliefs, Instrumental Variable Estimates



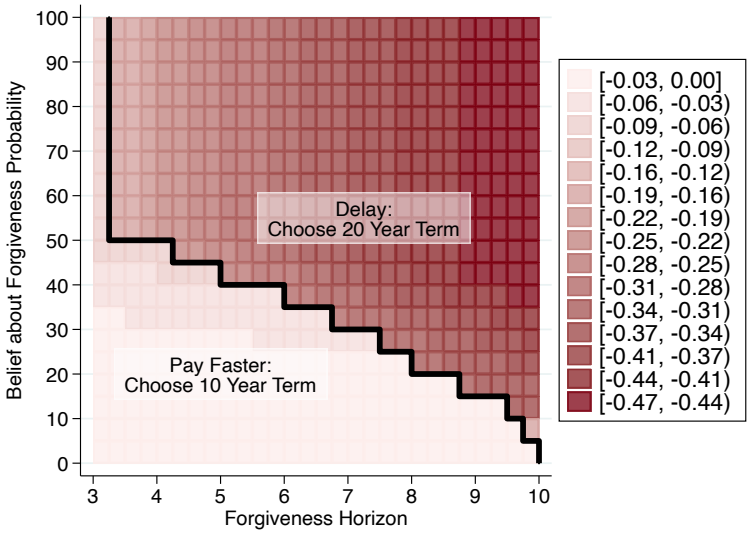
Notes: Figure reports the effect of a 1 percentage point increase in beliefs on the propensity to make a student loan payment. Figure plots separate IV estimates from running the following IV regression, where the outcome is defined as a different month around the date of the information treatment:

$$y_{it}^{h} = \beta_{IV}^{h} \widehat{\pi^1} + \delta^{h} X_i + \epsilon_{it}^{h}$$
$$\pi_{it}^{1} = b_1 \mathbb{1}\{OptiTreat\} + d' X_i + u_{it}$$

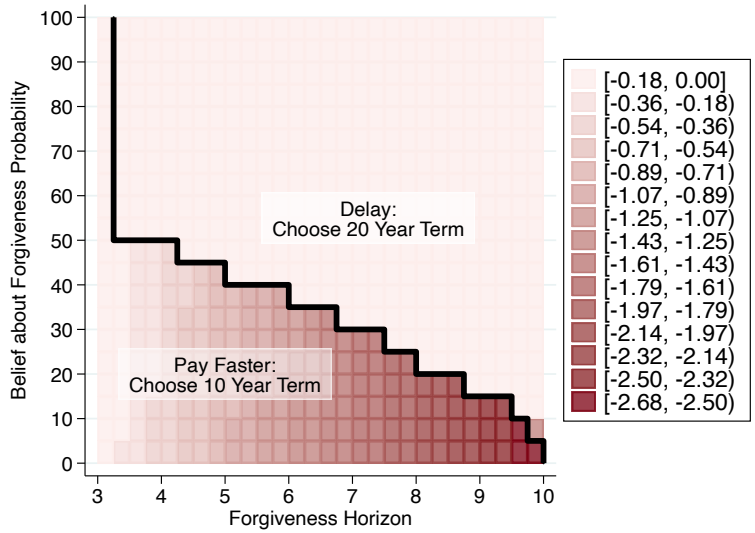
"Pooled" estimate from Table 6. In all regressions, the control group received no information treatment or the pessimistic treatment. Some individuals are in multiple independent treatments. Standard errors clustered at the individual level. * p <0.1, ** p<0.05, *** p<0.01. Source: credit data.

Figure 10: Equivalent Variation (%) Between Ex-Post Correct Belief and Various Ex-Ante Beliefs

(a) Equivalent Variation: If No Forgiveness



(b) Equivalent Variation: If Forgiveness



Notes: Figure answers the question: "What constant percent of my consumption would I need to give up under ex-post correct beliefs [Beliefs of 0% in Panel (a) or 100% forgiveness by the year indicated on the X-axis in Panel (b)], to make utility equivalent to having the beliefs indicated on the y-axis and the forgiveness horizon given on the x-axis." Agents choose an optimal term choice (10 or 20 years), based on their ex-ante beliefs. The thick black line denotes the optimal term choice given the ex-ante beliefs about forgiveness for the horizon indicated on the X-axis. Forgiveness refers to receiving forgiveness on remaining balance. In our baseline calibration, agents are assumed to have CRRA preferences with CRRA parameter $\rho = 2$ and discount factor $\beta = 0.96$. The rate of borrowing for student loans, r_b, is set at 6.5 percent; the rate for saving and outside borrowing, r_s, is set at 5 percent. The first three years payments are assumed paused and the loan accrues no interest. Interest begins to accrue after three years from origination. Agents are otherwise assumed to be identical across beliefs and loan characteristics. Student loan balances, income and beliefs are calibrated based on credit bureau data and survey responses.

Tables

Table 1: Summary Statistics, by Above/Below Median Beliefs

	(1) "Pessimistic" Beliefs∈[0,18]	(2) "Optimistic" Beliefs ∈[19,100]	(3) Difference (2)-(1)
Student Loan Outcomes			
Mean balance	70,021.52	72,148.61	2,127.08
Median balance	46,605.00	49,768.00	3,163.00
Newest, age in years	6.43	6.10	-0.33
Any deferred	0.31	0.34	0.03
Any delinquent	0.06	0.06	0.00
Any monthly payment	0.49	0.43	-0.05***
Mean monthly payment if >0	410.50	361.26	-49.24*
Other Credit and Employment Outcomes			
Any revolving balance	0.84	0.82	-0.01
Mean revolving balance if >0	10,909.25	10,824.99	-84.26
Any auto balance	0.60	0.61	0.01
Mean auto balance if >0	19,284.78	19,340.18	55.40
Any mortgage balance	0.41	0.44	0.03*
Mean mortgage balance if >0	194,959.21	176,556.62	-18,402.59***
Vantage 4.0 Credit Score	665.79	657.11	-8.68**
Any Employment	0.315	0.316	0.001
Gross monthly income if >0	7,112.48	6,571.41	-541.07
Borrower Characteristics			
Age	45.56	46.78	1.22***
Female	0.59	0.57	-0.02
Married	0.48	0.48	-0.01
Has children	0.50	0.46	-0.04*
Zipcode and County Characteristics			
Zipcode AGI (2019)	67,443.59	64,980.32	-2,463.27**
Zipcode ZHVI Home prices (Feb 2020)	252,294.54	245,803.48	-6,491.06
Zipcode Δln(ZHVI), Dec 2023-Feb 2020	0.34	0.33	-0.00
County COVID mortality cumul. per 100k	312.58	319.62	7.04*
N	1467	1427	

Notes: Table shows summary statistics comparing those with below median to above median beliefs about 1-year ahead forgiveness as measured at the time of first survey. Restricted to those with balance reported in credit bureau data as of survey month. Outcomes shown for February 2020 (pre-COVID payment pause) unless otherwise specified. Stars denote statistical significance of differences in means using robust standard errors, $*$ p<0.1, $**$ p<0.05, $***$ p<0.01. Source: Zipcode AGI from IRS Tax Stats; ZHVI from Zillow Research; COVID mortality from Opportunity Insights. Other outcomes from credit and employment data.

Table 2: Student Loan Payment Outcomes Around Forgiveness Announcements

	(a) 8/2022 Executive Forgiveness Order			(b) 6/23 Supreme Court Decision		
	(1)	(2)	(3)	(4)	(5)	(6)
	Prob Forgive	Any Pay	Pay ($)	Prob Forgive	Any Pay	Pay ($)
Beliefs (Below/Above Median) × Post	0.202***	-0.00137	1.489	-0.267***	0.00474	-5.388
	(0.0690)	(0.00925)	(4.935)	(0.0277)	(0.0130)	(8.629)
Post × Bal<$10k	0.0869	0.00897	0.00897	-0.0584**	0.00877	0.00877
	(0.128)	(0.0163)	(8.633)	(0.0257)	(0.0254)	(9.954)
Beliefs × Post × Bal<$10k	-0.0694	-0.0775***	-38.47**	0.0907	0.0654*	13.89
	(0.176)	(0.0274)	(16.15)	(0.152)	(0.0376)	(11.46)
Pre-Period Mean	0.21	0.22	80.25	0.26	0.24	89.44
Individuals	143	1,776	1,776	332	944	944
Total Observations	286	14,208	14,208	664	7,545	7,545
Individual FE	X	X	X	X	X	X
Time FE	X	X	X	X	X	X

Notes: Table reports coefficients from estimating:

$$y_{i,t} = \beta_1 Beliefs^{pre} \times Post_t + \beta_2 \mathbb{1}\{Balance^{pre} < \$10k\} \times Post_t + \beta_3 Beliefs^{pre} \times \mathbb{1}\{Balance^{pre} < \$10k\} \times Post_t + \alpha_i + \alpha_t + \epsilon_{i,t}$$

In column (1) and (4), regression is restricted to individuals in a post-event resurvey of beliefs. In Panel (a), the estimation window is from April 2022-December 2022, excluding August 2022 (partial treatment). $Post_t$ refers to period from September 2022, the first full month following the 8/24/2022 forgiveness announcement. $Beliefs^{pre}$ is an indicator for having below-median beliefs prior to the announcement (i.e. having "Pessimistic" beliefs). In panel (b), the estimation window is from March 2023-October 2023. $Post_t$ refers to period from July 2023, following the June 30 Supreme Court decision, and $Beliefs^{pre}$ is an indicator for having above-median beliefs prior to the Supreme Court decision (i.e. having "Optimistic" beliefs). Standard errors clustered at the individual level in parentheses. $*$ p<0.1, $**$ p<0.05, $***$ p<0.01. Source: credit and employment data

Table 3: Spending Responses Around August 2022 Forgiveness Announcement

	(1) Total Spend	(2) Food	(3) All Other	(4) Ln Total	(5) Ln Food
Beliefs (Below Median) × Post	-7.476	-5.013	1.046	-0.0160	-0.0103
	(15.21)	(5.781)	(12.90)	(0.0167)	(0.0225)
Post × Bal< 10k	-54.24**	1.295	-47.74**	-0.0658**	0.0312
	(26.66)	(9.641)	(23.16)	(0.0315)	(0.0435)
Beliefs × Post × Bal< 10k	100.5***	4.868	83.82**	0.118***	0.00114
	(37.29)	(13.87)	(32.54)	(0.0425)	(0.0590)
Pre-Period Mean	1113.04	323.60	783.25	6.75	5.39
Individuals	5493	5493	5493	5493	5394
Observations	43557	43557	43557	43556	39539
Individual FE	X	X	X	X	X
Time FE	X	X	X	X	X

Notes: Table reports coefficients from estimating:

$$y_{i,t} = \beta_1 Beliefs^{pre} \times Post_t + \beta_2 \mathbb{1}\{Balance^{pre} < \$10k\} \times Post_t + \beta_3 Beliefs^{pre} \times \mathbb{1}\{Balance^{pre} < \$10k\} \times Post_t + \alpha_i + \alpha_t + \epsilon_{i,t}$$

Estimation window from April 2022-December 2022, excluding August 2022 (partial treatment). $Post_t$ refers to period from September 2022, the first full month following the 8/24/2022 forgiveness announcement. $Beliefs^{pre}$ is an indicator for having below-median beliefs prior to the announcement (i.e. having "Pessimistic" beliefs). Standard errors clustered at the individual level in parentheses. $*$ p<0.1, $**$ p<0.05, $***$ p<0.01. Source: Numerator data.

Table 4: Student Loan Payment Outcomes Around End of Payment Pause

	(1) Any Pay	(2) Pay ()
Pause Beliefs (Above-Median) × Post	-0.0714***	-40.32***
	(0.0274)	(12.36)
Forgiveness Beliefs (Above-Median) × Post	0.0256	1.630
	(0.0274)	(12.47)
Pre-Period Mean	0.22	89.47
Individuals	773	773
Observations	6956	6956
Individual FE	X	X
Time FE	X	X

Notes: Table reports coefficients from estimating:

$$y_{i,t} = \beta_1 \mathbb{1}\{PauseBeliefs^{Pre} > Median\} \times Post_t + \beta_2 \mathbb{1}\{ForgivenessBeliefs^{Pre} > Median\} \times Post_t + \gamma_i + \gamma_t + \epsilon_{i,t}$$

Estimation window from June 2023-February 2024. $Post_t$ refers to the period from October 2023 when payments were again due. Sample is restricted to student loan borrowers with beliefs surveyed post the June 30 Supreme Court Decision. Standard errors clustered at the individual level in parentheses. $*$ p<0.1, $**$ p<0.05, $***$ p<0.01.

Table 5: Effect of Information Treatment on Beliefs

	(1) Prob Forgive	(2) Prob Forgive	(3) Prob Forgive	(4) Prob Forgive	(5) Prob Forgive
Opti Treat	0.0365***	0.0375***		0.0434***	0.0411***
	(0.00877)	(0.0100)		(0.0111)	(0.0118)
Pessi Treat		0.00195			
		(0.00978)			
Opti Treat-1			0.0337***		
			(0.0106)		
Opti Treat-2			0.101		
			(0.0795)		
Opti Treat-3			0.0288*		
			(0.0163)		
Opti Treat × Bal <10k					0.0187
					(0.0340)
Bal <10k					-0.0107
					(0.0205)
Observations	5128	5128	5128	3226	3226
R^2	0.0298	0.0298	0.0293	0.0360	0.0361
F-stat	17.32	8.683	4.881	15.45	5.245
Survey Year-Month FE	X	X	X	X	X
Pre Balance>0				X	X
No Payment Required				X	X

Notes: Regression of 1-year ahead forgiveness beliefs, on the experimental information treatment indicated in the rows. The text of the information treatment is provided in Appendix B. In all regressions, there is a control group which received no information treatment. Some individuals are in multiple independent treatments. Standard errors clustered at the individual level in parentheses. * p <0.1, ** p<0.05, *** p<0.01.

Table 6: Effect of Information Treatment on Student Loan Payments and Voting Intentions

	(1)	(2)	(3)
	Student Loans		Prob Vote
	Any Pay	Pay ($)	≥ 0.5
Prob Forgive × Post Treat	-0.372**	-220.1	
	(0.170)	(179.2)	
Post Treat	0.122**	67.63	
	(0.0545)	(56.92)	
Prob Forgive			1.143**
			(0.558)
Observations	25791	25791	2359
Individual FE	X	X	
Year-Month FE	X	X	X
Pre Balance>0	X	X	X
No Payment Required	X	X	X

Notes: Columns (1)-(3) report results from an IV event-study framework:

$$y_{it} = \beta_{IV} \widehat{\pi^1 \times \mathbb{1}\{Post\}} + \beta_2 \mathbb{1}\{Post\} + \alpha_i + \alpha_t + \epsilon_{it}$$
$$\pi^1_{it} \times \mathbb{1}\{Post\} = b_1 \mathbb{1}\{OptiTreat\} \times \mathbb{1}\{Post\} + b_2 \mathbb{1}\{Post\} + a_i + a_t + u_{it}$$

where $\mathbb{1}\{Post\}$ is a post survey indicator, π^1 are one-year ahead beliefs about forgiveness, $\mathbb{1}\{OptiTreat\}$ is an indicator for receiving the optimist information treatment, and α_i and α_t are individual and time fixed effects. The event window is 4 months around the survey month, excluding the survey month due to partial treatment. Column (4) examines the simple IV regression, restricting only to the survey month:

$$y_{it} = \beta_{IV} \widehat{\pi^1} + \alpha_t + \epsilon_{it}$$
$$\pi^1_{it} = b_1 \mathbb{1}\{OptiTreat\} + a_t + u_{it}$$

In all regressions, the control group received no information treatment or the pessimistic treatment. Some individuals are in multiple independent treatments in the event studies. Standard errors clustered at the individual level in parentheses. * p <0.1, ** p<0.05, *** p<0.01.

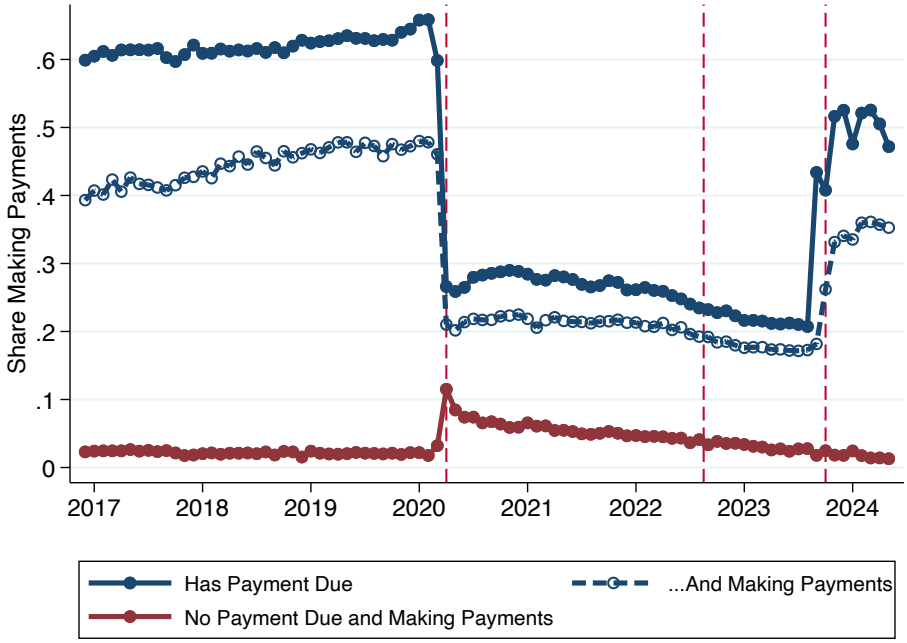
Table 6: Equivalent Variation Between Ex-Post Correct Belief and Selected Ex-Ante Beliefs

	(1)	(2)	(3)	(4)	(5)
	Fixed Within Repayment Plan			Optimal Repayment Plan	
	Forgiveness Realizations:			Forgiveness Realizations:	
	No Forgiveness	Forgiveness 3 Years from Origination	Forgiveness 10 Years from Origination	No Forgiveness	Forgiveness 10 Years from Origination
Choose 10-year repayment plan:					
0% Forgiveness	**0.00**	-0.08	0.00	**0.00**	-2.79
50th Percentile	-0.01	-0.03	0.00	-0.02	-2.79
Mean	-0.02	-0.02	0.00	-0.04	-2.79
100%	-0.08	**0.00**	**0.00**	-0.08	-2.79
Choose 20-year repayment plan:					
0% Forgiveness	**0.00**	-0.09	-0.11	-0.35	-0.11
50th Percentile	-0.01	-0.04	-0.02	-0.45	-0.02
Mean	-0.03	-0.02	-0.00	-0.36	-0.00
100%	-0.09	**0.00**	**0.00**	-0.44	**0.00**

Notes: Table answers the question: "What constant percent of my consumption would I need to give up under ex-post correct beliefs, to make utility equivalent to the indicated beliefs?" Columns (1)-(3) compare differences to correct beliefs within a payment plan choice (10-year or 20-year). In columns (4)-(5), households choose the repayment plan that maximizes their utility under their ex-ante beliefs about forgiveness. "No forgiveness" is relative to a counterfactual where forgiveness is expected after 3 years at the indicated beliefs. Forgiveness refers to receiving forgiveness on remaining balance. In our baseline calibration, agents are assumed to have CRRA preferences with CRRA parameter $\rho = 2$ and discount factor $\beta = 0.96$. The rate of borrowing for student loans, r_b, is set at 6.5 percent; the rate for saving and outside borrowing, r_s, is set at 5 percent. The first three years payments are assumed paused and the loan accrues no interest. Interest begins to accrue after three years from origination. Agents are otherwise assumed to be identical across beliefs and loan characteristics. Student loan balances, income and beliefs are calibrated based on credit bureau data and survey responses. Under this calibration, the 10-year repayment plan is optimal if no forgiveness is expected, and 20-year repayment plan is optimal if forgiveness is expected. Ex-post correct beliefs are in bold.

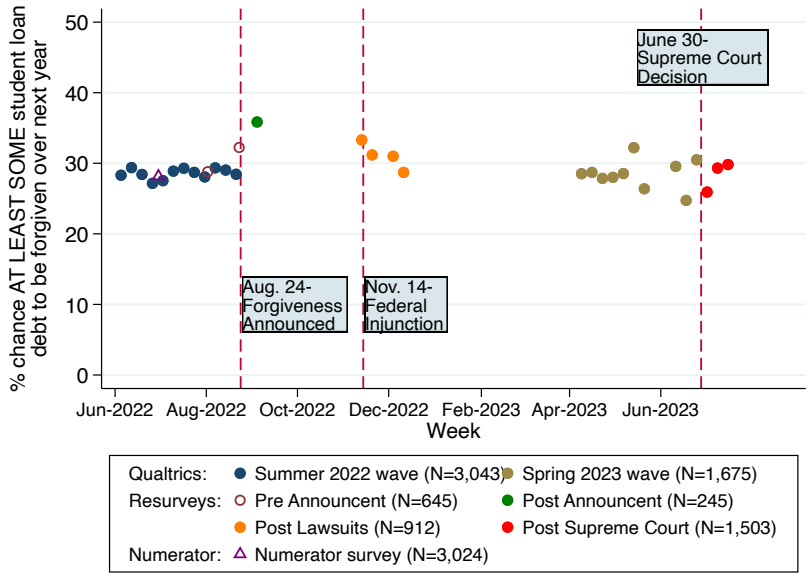
A Appendix Figures and Tables

Figure A.1: Share Making Any Student Loan Payment or Refi-Respondents



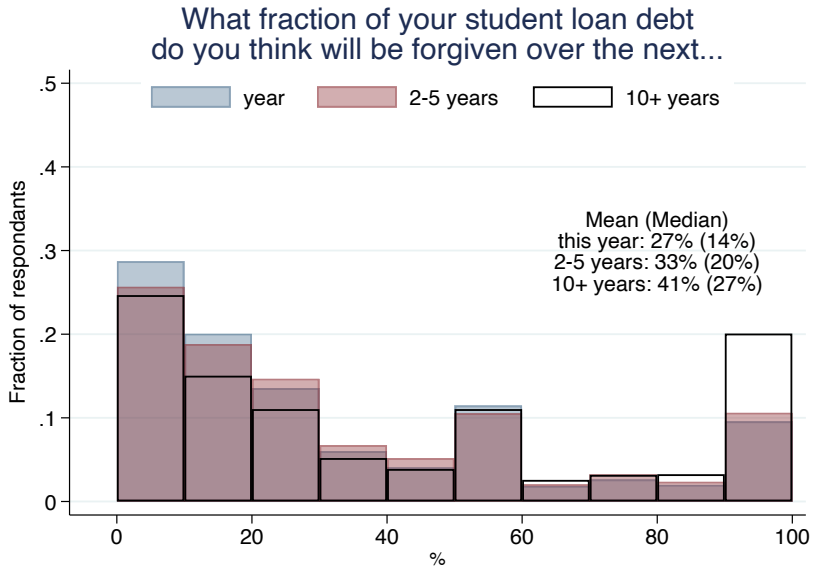
Notes: Figure shows the share of borrowers making a payment on student loans, conditional on having an open balance in February 2020. Vertical lines indicate April 2020, the start of the payment pause, August 2022 Biden's Forgiveness Announcement, and October 2023, the month the payment pause ended. Source: Credit data.

Figure A.2: Standard Deviation of Survey Expectations Over Time



Notes: Figure shows cross-sectional standard deviation of beliefs about 1-year ahead forgiveness from our survey.

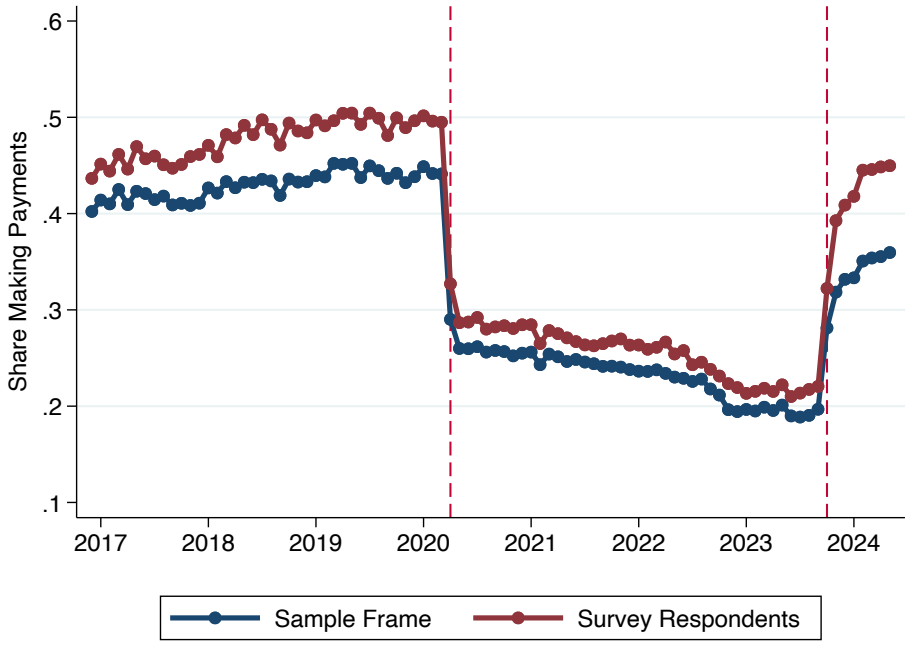
Figure A.3: Fraction of Student Loan Debt Expected to Be Forgiven (Positive Beliefs)



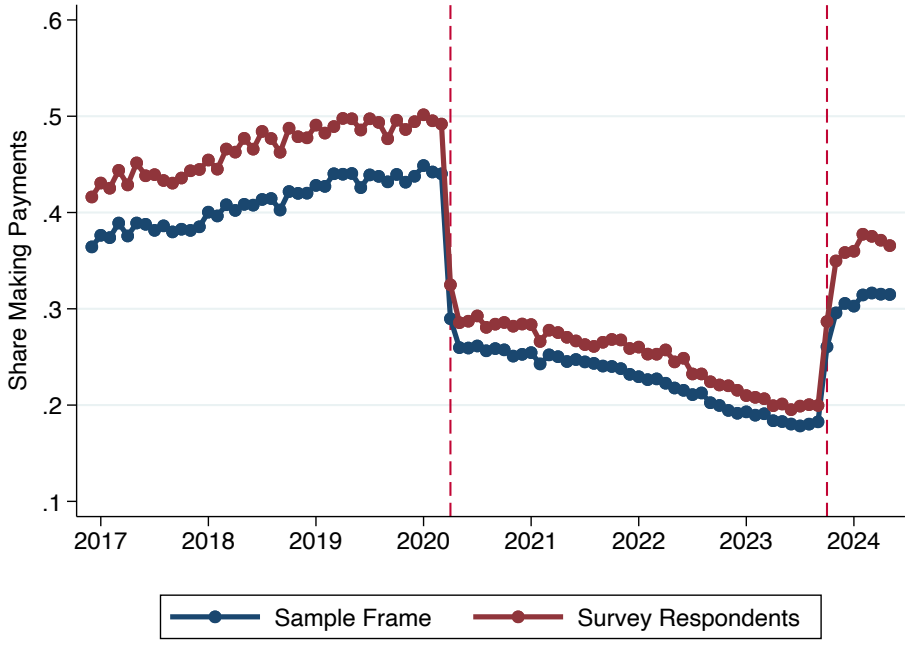
Notes: Figure shows the fraction of student loan debt respondents expect to be forgiven, among respondents with positive beliefs about forgiveness.

Figure A.4: Share Making Any Student Loan Payment-Respondents v Survey Frame

(a) Conditional on Open balance in Month



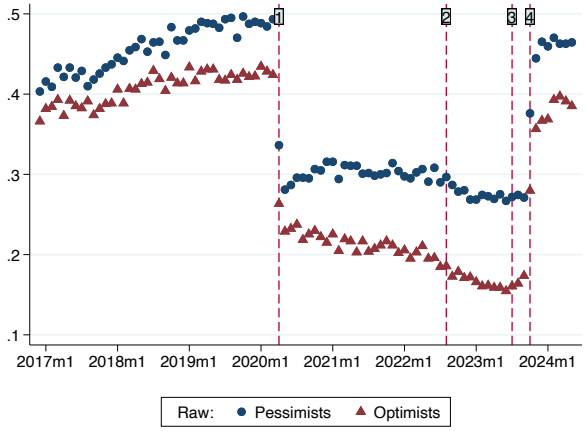
(b) Conditional on Balance in Feb 2020



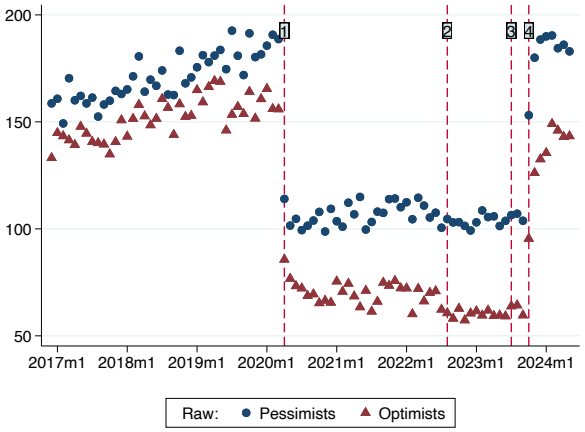
Notes: Figure shows the share of borrowers making a payment on student loans. Vertical lines indicate April 2020, the start of the payment pause, and October 2023, the month the payment pause ended. Source: Credit data.

Figure A.5: Raw Means of Student Loan Outcomes, Above v. Below Median Beliefs

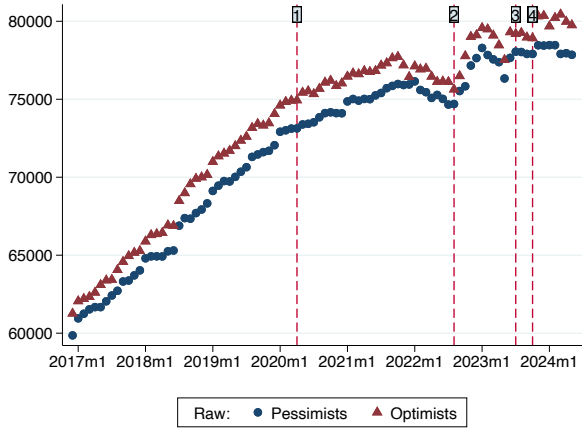
(a) Any Payment



(b) Payment ($)

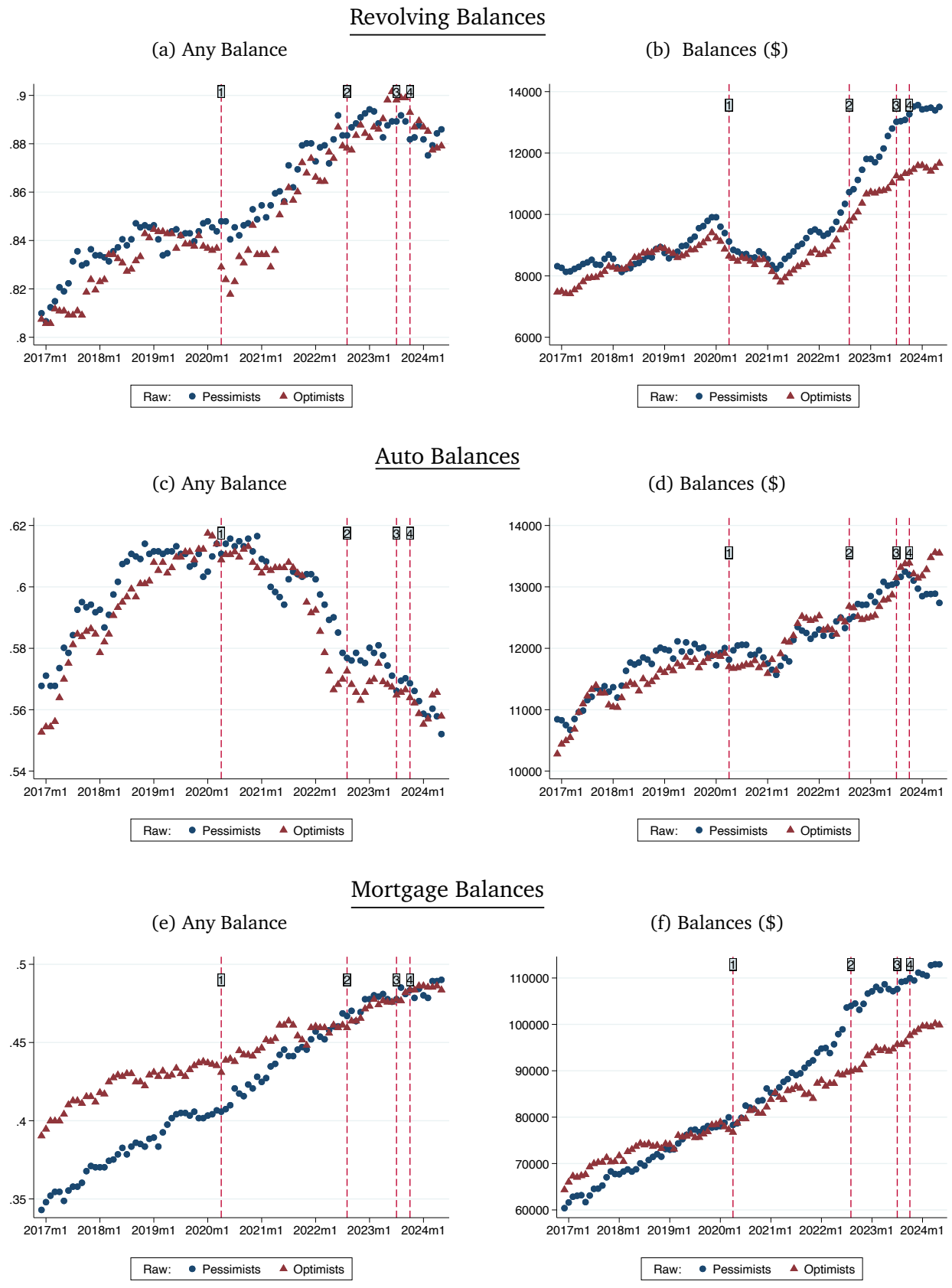


(c) Balances ($)



Notes: Raw means by above/below median beliefs at time of survey. Source: credit data.

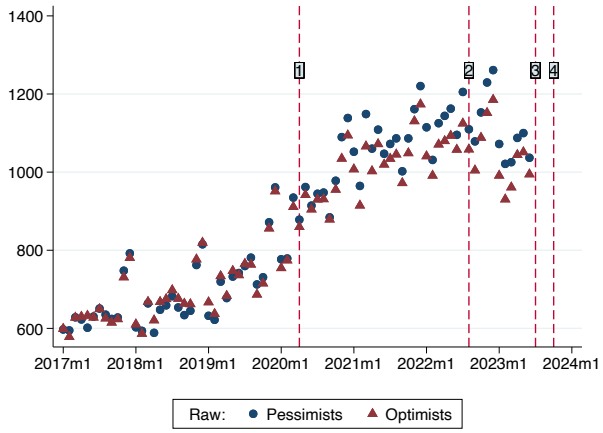
Figure A.6: Raw Means of Credit Outcomes, Above v. Below Median Beliefs



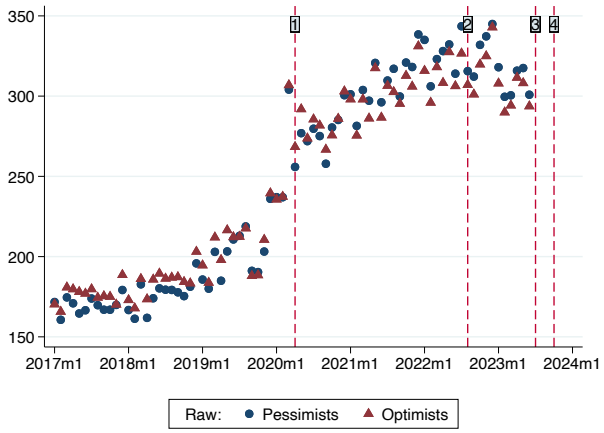
Notes: Notes: Raw means by above/below median beliefs at time of survey. Source: credit data.

Figure A.7: Raw Means of Numerator Spending Outcomes, Above v. Below Median Beliefs

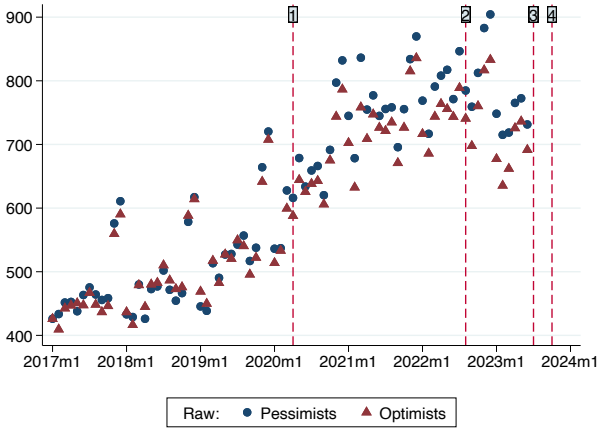
(a) Total Spending



(b) Food Spending



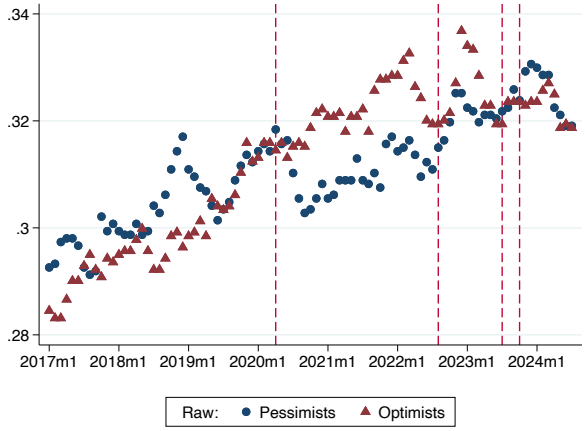
(c) Other Spending



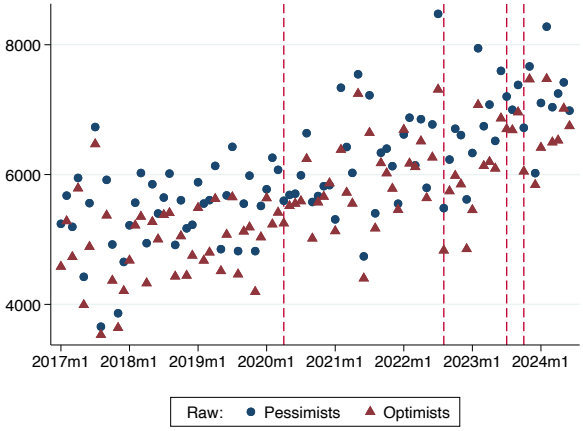
Notes: Raw means by above/below median beliefs at time of survey. Source: Numerator.

Figure A.8: Raw Means of Employment Outcomes, Above v. Below Median Beliefs

(a) Any Employment



(b) Gross Monthly Earnings if > 0 ($)

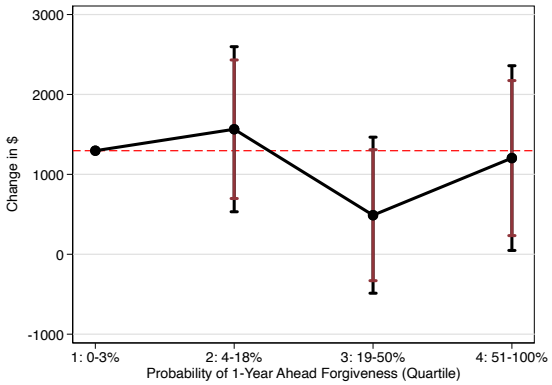


Notes: Notes: Raw means by above/below median beliefs at time of survey. Source: Employment data.

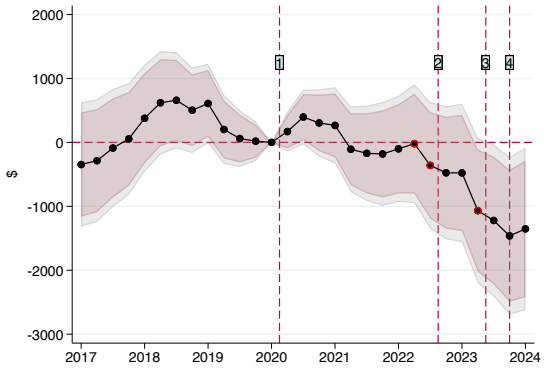
Figure A.9: Evolution of Credit Outcomes, By 1-Year Ahead Forgiveness Beleifs

Revolving Balances ($)

(a) At Time of Survey, Change Since Feb 2020

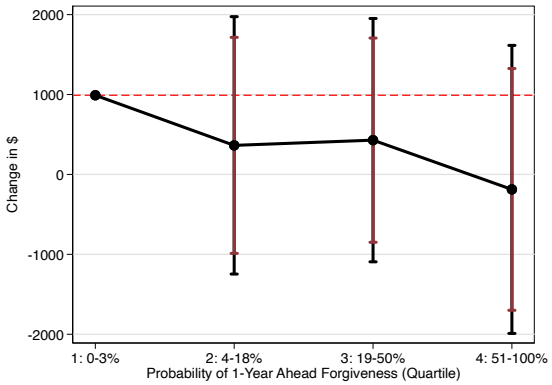


(b) Evolution, Above v. Below Median Beliefs

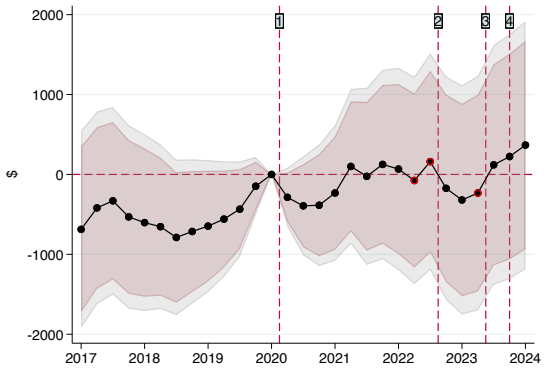


Auto Balances ($)

(c) At Time of Survey, Change Since Feb 2020

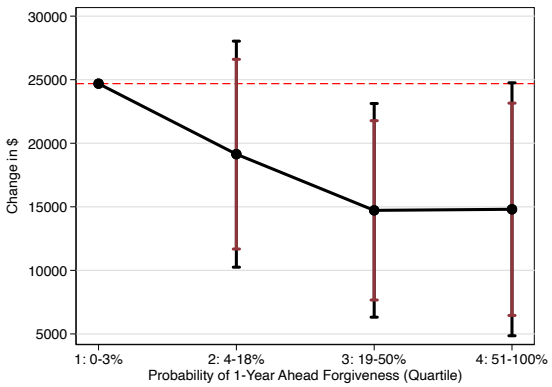


(d) Evolution, Above v. Below Median Beliefs

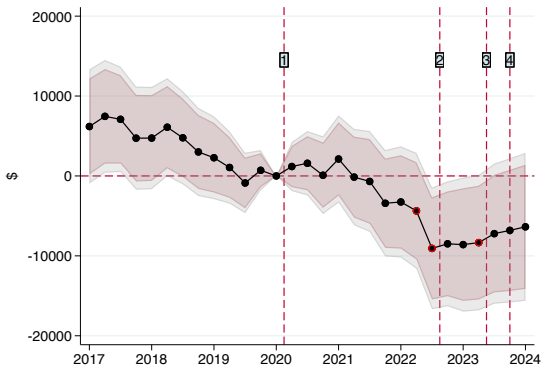


Mortgage Balances ($)

(e) At Time of Survey, Change Since Feb 2020



(f) Evolution, Above v. Below Median Beliefs

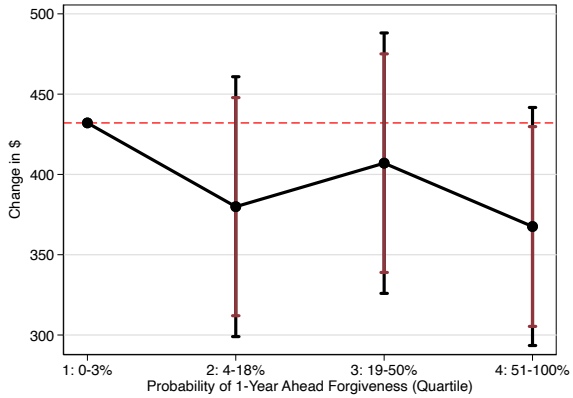


See notes for Figure 5. Source: Credit data.

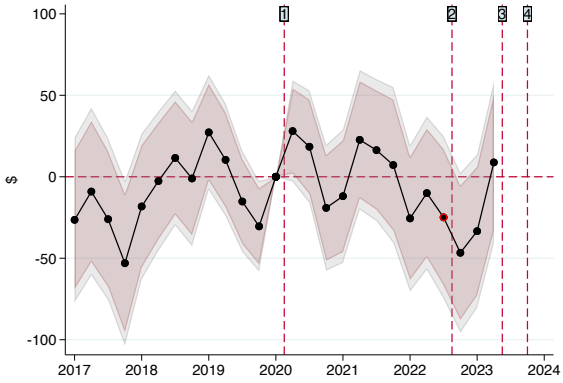
Figure A.10: Evolution of Numerator Spending Outcomes, By 1-Year Ahead Forgiveness Beliefs

Total Spending ($)

(a) At Time of Survey, Change Since Feb 2020

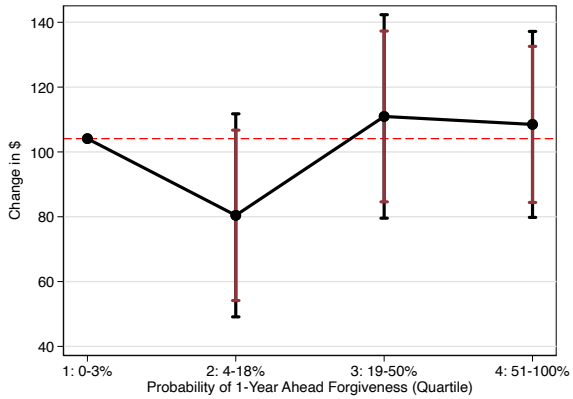


(b) Evolution, Above v. Below Median Beliefs

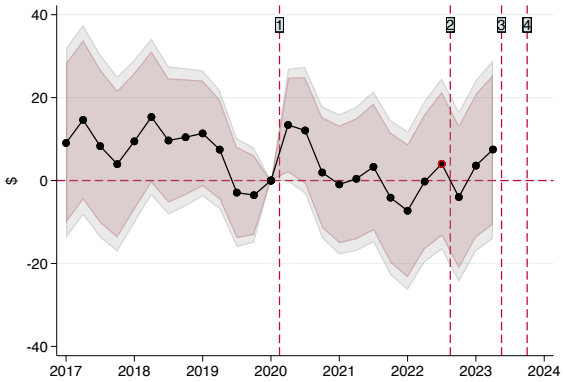


Food Spending ($)

(c) At Time of Survey, Change Since Feb 2020

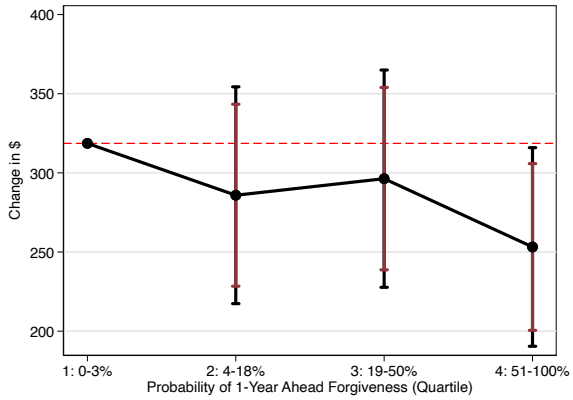


(d) Evolution, Above v. Below Median Beliefs

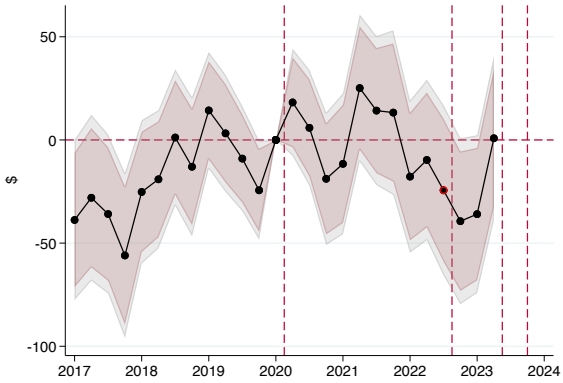


Other Spending ($)

(e) At Time of Survey, Change Since Feb 2020



(f) Evolution, Above v. Below Median Beliefs

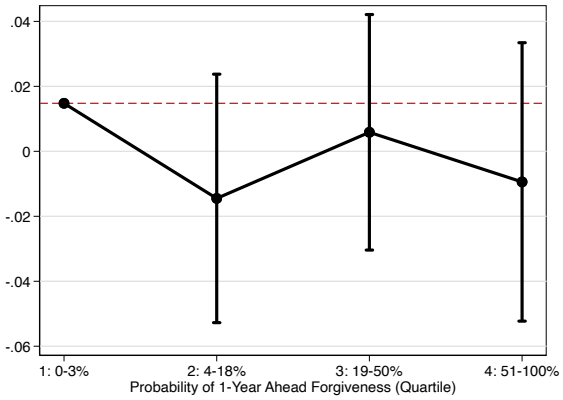


See notes for Figure 5. Source: Numerator.

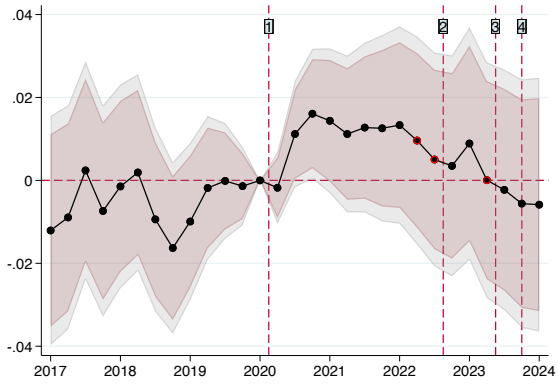
Figure A.11: Evolution of Employment Outcomes

Any Employment

(a) At Time of Survey, Change Since Feb 2020

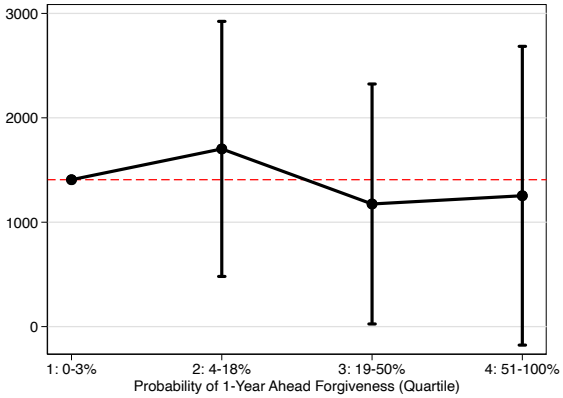


(b) Evolution, Above v. Below Median Beliefs

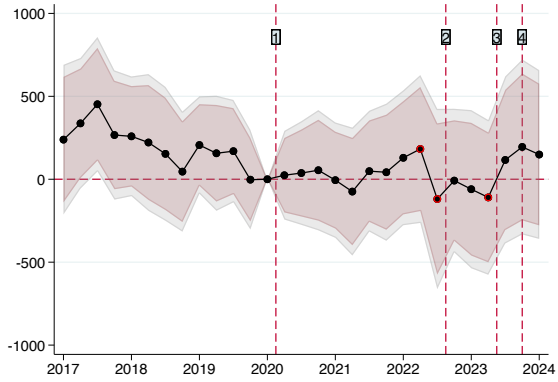


Gross Monthly Earnings if > 0 ($)

(c) At Time of Survey, Change Since Feb 2020



(d) Evolution, Above v. Below Median Beliefs



Notes: See notes for Figures 5. Source: Employment data.

Table A.1: Consumption Survey Intentions, By Optimism and Liquidity

	(1) Spend House	(2) Spend Car	(3) Other Durables	(4) Other Spend
Prob 1-Yr Forgive	0.0593*	0.0226	0.00922	0.00600
	(0.0328)	(0.0335)	(0.0265)	(0.0369)
Savings: $1-$5k	-0.0446*	-0.0492**	0.00164	0.0129
	(0.0229)	(0.0234)	(0.0185)	(0.0258)
Savings: $5k+	-0.0231	-0.0575**	-0.00754	0.00935
	(0.0259)	(0.0265)	(0.0210)	(0.0292)
Constant	0.148***	0.183***	0.0887***	0.186***
	(0.0200)	(0.0204)	(0.0162)	(0.0225)
N	1430	1430	1432	1432

Notes: Standard errors clustered at the individual level in parentheses. $*$ p<0.1, $**$ p<0.05, $***$ p<0.01.

Table A.2: Summary Statistics, Survey Respondents v. Sample Frame

	(1) Respondents	(2) Sample Frame	(3) Difference (2)-(1)
Student Loan Outcomes			
Mean balance	73,104.25	49,311.30	-23,792.95***
Median balance	50,776.00	29,435.00	-21,341.00
Newest, age in years	6.30	6.28	-0.02
Any deferred	0.33	0.33	-0.00
Any delinuqent	0.05	0.08	0.03***
Any monthly payment	0.50	0.45	-0.05***
Mean monthly payment if >0	390.52	351.80	-38.73**
Other Credit and Employment Outcomes			
Any revolving balance	0.84	0.78	-0.07***
Mean revolving balance if >0	11,202.09	10,356.58	-845.51**
Any auto balance	0.61	0.59	-0.02**
Mean auto balance if >0	19,333.12	19,892.85	559.73
Any mortgage balance	0.45	0.41	-0.05***
Mean mortgage balance if >0	184,149.61	186,894.47	2,744.86
Vantage 4.0 Credit Score	666.99	650.85	-16.14***
Any Employment	0.315	0.297	0.018**
Gross monthly income if >0	5,731.45	5,658.16	73.30
Borrower Characteristics			
Age	46.44	43.67	-2.77***
Female	0.58	0.51	-0.06***
Married	0.48	0.49	0.01
Has children	0.49	0.49	0.01
Zipcode and County Characteristics			
Zipcode AGI (2019)	65,864.02	66,196.98	332.96
Zipcode ZHVI Home prices (Feb 2020)	247,341.50	242,818.82	-4,522.68
Zipcode Δ ln(ZHVI), Dec 2023-Feb 2020	0.33	0.34	0.00
County COVID mortality cumul. per 100k	316.38	326.19	9.81***
N	2,603	26,604	

Notes: Table shows summary statistics comparing survey respondents to non-respondents. Restricted to those with balance reported in credit bureau data as of February 2020. Outcomes shown for February 2020 (pre-COVID payment pause) unless otherwise specified. Stars denote statistical significance of differences in means using robust standard errors, $*$ p<0.1, $**$ p<0.05, $***$ p<0.01. Source: Zipcode AGI from IRS Tax Stats; ZHVI from Zillow Research; COVID mortality from Opportunity Insights. Other outcomes from credit and employment data.

Table A.3: Credit and Employment Outcomes Around Forgiveness Announcements

(a) August 2022 Forgiveness Announcement

	(1) Revolving Bal ($)	(2) Auto Bal ($)	(3) Mortgage Bal ($)	(4) Employment Any
Pess× Post	83.91	700.8*	-1363.1	0.0035
	(302.0)	(392.0)	(2386.3)	(0.0098)
Post× Bal< 10k	-411.1	1352.1	1491.2	0.0048
	(537.7)	(1083.3)	(4344.6)	(0.01245)
Pess× Post× Bal< 10k	-422.5	-2601.7**	606.7	-0.0078
	(720.0)	(1171.5)	(6782.8)	(0.0248)
Pre mean	9,620.04	12,245.57	100444.95	0.3185
N	1776	1776	1776	1776
NxT	14208	14208	14208	14208
Ind FE	X	X	X	X
Time FE	X	X	X	X

(b) June 2023 Supreme Court Decision

	(1) Revolving Bal ($)	(2) Auto Bal ($)	(3) Mortgage Bal ($)	(4) Employment Any
Opti× Post	-179.4	138.3	-2280.6	0.0045
	(370.9)	(475.3)	(2211.1)	(0.0114)
Post× Bal< 10k	1099.0	1272.0	261.9	-0.0004
	(1186.1)	(990.3)	(4882.7)	(0.0197)
Opti× Post× Bal< 10k	-888.1	-1981.6*	1093.9	-0.0037
	(1277.8)	(1140.5)	(5604.6)	(0.0296)
Pre mean	10389.02	12863.14	88247.79	0.3153
N	944	944	944	944
NxT	7545	7545	7545	7545
Ind FE	X	X	X	X
Time FE	X	X	X	X

Notes: Table reports coefficients from estimating:

$$y_{i,t} = \beta_1 Beliefs^{pre} \times Post_t + \beta_2 \mathbb{1}\{Balance^{pre} < \$10k\} \times Post_t + \beta_3 Beliefs^{pre} \times \mathbb{1}\{Balance^{pre} < \$10k\} \times Post_t + \alpha_i + \alpha_t + \epsilon_{i,t}$$

Panel A. Estimation window from April 2022-December 2022, excluding August 2022 (partial treatment). $Post_t$ refers to period from September 2022, the first full month following the 8/24/2022 forgiveness announcement. $Beliefs^{pre}$ is an indicator for having below-median beliefs prior to the announcement, denoted *Pess* in the table. Panel B: Estimation window from March 2023-October 2023. $Post_t$ refers to period from July 2023, following the June 30 Supreme Court decision, and $Beliefs^{pre}$ is an indicator for having above-median beliefs prior to the Supreme Court decision, denoted $Opti$ in the table. Standard errors clustered at the individual level in parentheses. $*$ p<0.1, $**$ p<0.05, $***$ p<0.01. Source: Credit and employment data

Table A.4: Credit and Employment Outcomes Around End of Payment Pause

	(1) Revolving Bal ($)	(2) Auto Bal ($)	(3) Mortgage Bal ($)	(4) Employment Any
Opti Repayment× Post	-446.7	-134.2	-5898.0**	-0.0151
	(344.3)	(455.0)	(2843.4)	(0.0115)
Opti Forgiveness× Post	-7.690	-490.7	2060.7	0.0028
	(345.9)	(455.7)	(2904.9)	(0.0116)
Pre mean	11109.17	12424.29	95602.30	0.306
N	773	773	773	773
NxT	6956	6956	6956	6956
Ind FE	X	X	X	X
Time FE	X	X	X	X

Notes: Table reports coefficients from estimating:

$$y_{i,t} = \beta_1 \mathbb{1}\{OptimistRepayment^{Pre}\} \times Post_t + \beta_2 \mathbb{1}\{OptimistForgiveness^{Pre}\} \times Post_t + \gamma_i + \gamma_t + \epsilon_{i,t}$$

Estimation window from June 2023-February 2024. $Post_t$ refers to the period from October 2023 when payments were again due. Sample is restricted to student loan borrowers with beliefs surveyed post the June 30 Supreme Court Decision. Standard errors clustered at the individual level in parentheses. $*$ p<0.1, $**$ p<0.05, $***$ p<0.01.

Table A.5: Effect of Information Treatment on Credit and Employment Outcomes, Instrumental Variable Estimates

	(1) Revolving Bal ($)	(2) Auto Bal ($)	(3) Mortgage Bal ($)	(4) Employment Any
Prob Forgive × Post Treat	4877.8	-6262.7	-61072.0	0.0453
	(5582.1)	(6704.9)	(40200.6)	(0.1563)
Post Treat	-1634.0	2227.4	19813.2	-0.0106
	(1800.3)	(2145.9)	(13051.9)	(0.0482)
Prob Forgive				
NxT	25791	25791	25791	25791
Individual FE	X	X	X	X
Year-Month FE	X	X	X	X
Pre Balance>0	X	X	X	X
No Payment Required	X	X	X	X

Notes: Table report results from an IV event-study framework:

$$y_{it} = \beta_{IV} \widehat{\pi^1 \times \mathbb{1}\{Post\}} + \beta_2 \mathbb{1}\{Post\} + \alpha_i + \alpha_t + \epsilon_{it}$$
$$\pi^1_{it} \times \mathbb{1}\{Post\} = b_1 \mathbb{1}\{OptiTreat\} \times \mathbb{1}\{Post\} + b_2 \mathbb{1}\{Post\} + a_i + a_t + u_{it}$$

where $\mathbb{1}\{Post\}$ is a post survey indicator, π^1 are one-year ahead beliefs about forgiveness, $\mathbb{1}\{OptiTreat\}$ is an indicator for receiving the optimist information treatment, and α_i and α_t are individual and time fixed effects. The event window is 4 months around the survey month, excluding the survey month due to partial treatment. In all regressions, the control group received no information treatment or the pessimistic treatment. Some individuals are in multiple independent treatments in the event studies. Standard errors clustered at the individual level in parentheses. * p <0.1, ** p<0.05, *** p<0.01.

B Experimental Design

B.0.1 May-June 2022

Table B.1: Treatments, May-June 2022

Optimistic	Pessimistc
"President Biden signaled to House Democrats that he is seriously considering taking action to forgive student-loan debt on a large scale, according to congressional aides and others familiar with the discussions. Following a meeting with the president at the White House, members of the Congressional Hispanic Caucus said they felt confident that Mr. Biden is warming to calls from progressive Democrats to take executive action to erase at least some of the debt held by borrowers with federal student loans. The president told the lawmakers that he was weighing the timing of any announcement." —WSJ, 4/26/2022	"President Biden would be on shaky legal ground if he were to pursue broad-based student debt cancellation by executive action, President Barack Obama's former top Education Department lawyer wrote in a legal analysis. Using executive action to cancel debts for student borrowers without tying relief to their individual needs and using regulatory procedures would put the Biden administration at risk of having its plan overruled in court, according to a legal analysis prepared by Charlie Rose, who served as the top lawyer in the Education Department under President Obama from 2009 to 2011." —WSJ, 5/4/2022

B.0.2 Nov-Dec 2022

Table B.2: Treatments, Nov-Dec 2022

Optimistic	Pessimistc
"Federal courts delivered two wins for President Joe Biden's student loan forgiveness plan. Supreme Court Justice Amy Coney Barrett rejected a challenge to the program brought by a Wisconsin taxpayers group. And on the same day, a federal district court judge rejected a separate lawsuit brought by six Republican-led states. Student loan cancellations, worth up to $20,000 per eligible borrower, could show up on borrowers' accounts soon." *Edited for brevity and readability.*	"A federal judge in Texas struck down the Biden administration's student-debt forgiveness plan, imperiling a key administration priority that would have canceled up to $20,000 in student loans for tens of millions of borrowers. The Biden administration's plan is an "unconstitutional exercise of Congress's legislative power" that also failed to go through normal regulatory processes, Judge Mark Pittman of the Northern District of Texas wrote in a 26-page opinion." *Edited for brevity and readability.*

B.0.3 April-June 2023

Table B.3: Treatments, April-June 2022

Optimistic	Pessimistc
"Is it a good idea for the government to cancel $400 billion in student loans? That is not the question that the Supreme Court confronted, though you could be forgiven for thinking it was. Tuesday's cases involved not the wisdom of loan relief but its legal merits—and, perhaps more importantly, the plaintiffs' right to challenge the program in the first place. Defying predictions of doom for the Biden administration, the arguments went much better than expected... The Biden administration rooted the program in the HEROES Act, which Congress enacted in 2003 to replace a previous statute that granted loan relief to people affected by 9/11. It allowed the education secretary to "waive or modify" student debt held by borrowers affected by any national emergency—not just terrorism. And it expressly let the secretary forgive many, many loans in one fell swoop, rather than "case-by-case." Initially set to expire in 2005, the HEROES Act was extended by Congress for another two years. Then, in 2007, Congress made the act permanent. By its plain text, the HEROES Act authorizes Biden's plan." *Edited for brevity and readability.*	"The Supreme Court's conservative majority signaled deep skepticism about President Joe Biden's plan to wipe out $400 billion in student loan debt for tens of millions of Americans, suggesting the president overstepped his powers under the law. In one of a series of troubling signs for the plan, Chief Justice John Roberts questioned a central premise of Biden's argument: that the president has authority to cancel student loans without explicit authority from Congress.." *Edited for brevity and readability.*

Table B.4: Experiment Balance

	(1) Control	(2) Optimistic Treat	(3) Pessimistic Treat	(4) Difference (2)-(1)	(5) Difference (3)-(1)
Student Loan Outcomes					
Mean balance	68,517.71	71,850.39	72,837.92	3,332.68	4,320.21
Median balance	48,725.00	49,173.00	45,740.00	448.00	-2,985.00
Newest, age in years	6.26	6.27	6.28	0.01	0.02
Any deferred	0.32	0.33	0.33	0.01	0.01
Any delinuqent	0.07	0.07	0.05	-0.00	-0.02
Any monthly payment	0.46	0.48	0.45	0.02	-0.01
Mean monthly payment if >0	389.56	382.48	391.19	-7.08	1.63
Other Credit and Employment Outcomes					
Any revolving balance	0.83	0.83	0.83	-0.00	-0.01
Mean revolving balance if >0	10,784.00	11,084.57	10,734.16	300.57	-49.84
Any auto balance	0.60	0.62	0.60	0.02	-0.00
Mean auto balance if >0	20,163.92	18,842.81	18,944.21	-1,321.11	-1,219.70
Any mortgage balance	0.43	0.43	0.42	-0.00	-0.01
Mean mortgage balance if >0	187,791.61	188,864.95	179,787.47	1,073.34	-8,004.14
Vantage 4.0 Credit Score	660.95	659.75	663.83	-1.21	2.87
Borrower Characteristics					
Age	46.14	46.20	46.16	0.06	0.02
Female	0.58	0.58	0.58	0.00	-0.00
Married	0.47	0.47	0.50	0.00	0.03
Has children	0.48	0.47	0.50	-0.01	0.02
Zipcode and County Characteristics					
Zipcode AGI (2019)	65,856.78	66,417.83	66,412.26	561.04	555.48
Zipcode ZHVI Home prices (Feb 2020)	245,608.34	251,427.05	250,235.12	5,818.70	4,626.78
Zipcode Δln(ZHVI), Dec 2023-Feb 2020	0.34	0.33	0.33	-0.00	-0.01*
County COVID mortality cumul. per 100k	319.57	310.28	318.33	-9.29**	-1.24
N	963	967	964		

Notes: Table shows summary statistics comparing those in the control group with the optimistic and pessimistic treatment groups. Outcomes shown for February 2020 (pre-COVID payment pause) unless otherwise specified. Stars denote statistical significance of differences in means using robust standard errors, $*$ p<0.1, $**$ p<0.05, $***$ p<0.01. Source: Zipcode AGI from IRS Tax Stats; ZHVI from Zillow Research; COVID mortality from Opportunity Insights. Other outcomes from credit and employment data.

C Additional Survey Results

Figure C.1: Beliefs about the Supreme Court Decision (Surveyed April-June 2023)

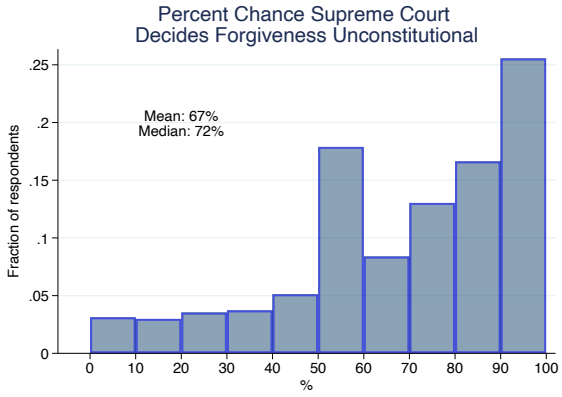


Figure C.2: Expected Sources of Forgiveness (Post SCOTUS Decision)

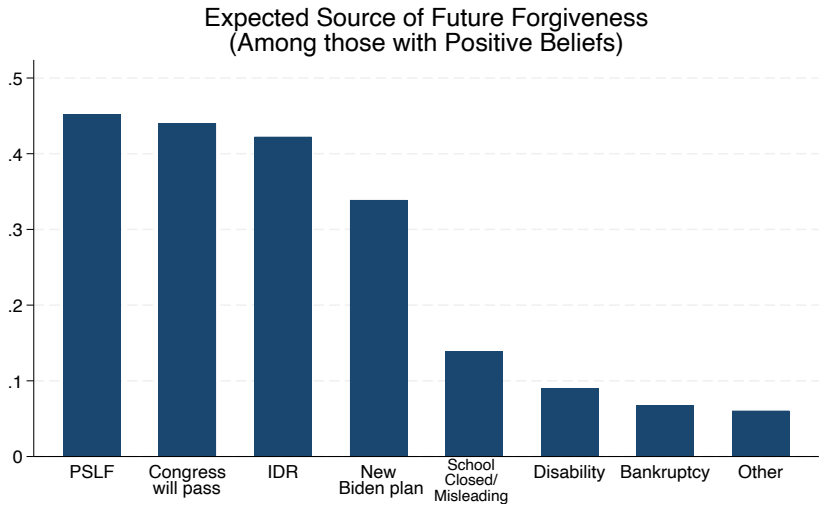
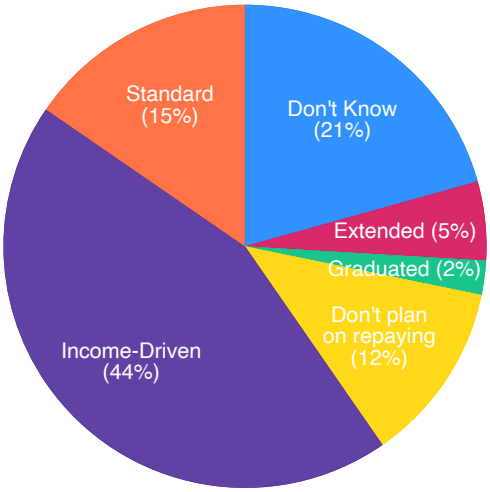


Figure C.3: Intended Plan Enrollment at Repayment



D Survey Instrument

D.1 Main Survey, June-Aug 2022

Thank you very much for your interest in our survey, which involves academic research. The purpose of the research is to better understand the pros and cons of several proposed reforms regarding debt forgiveness. There is no right or wrong answer. Answers are only right if they truly reflect your own views and opinions, as opposed to those of somebody else.

We do not foresee any type of risk or discomfort from this survey. Participation is entirely voluntary, and you will be able to leave the survey at any time you want if you faced unknown risks. Withdrawal from participation will not hinder you from learning about the economic reforms and provide your opinions about them.

For the analysis, the researchers need to merge your record with credit bureau data. Your answers will be analyzed in aggregation with the answers of all other respondents. All your answers will be confidential. The researchers who will evaluate the data will have no access to any identifiable information about you.

If you agree with these conditions, and are willing to participate in the survey, please check the box below:

I consent to the conditions to participate in the survey.

- ○ Yes
- ○ No

Have you ever taken out a student loan to help pay for your own education? This would exclude loans you took out for any other person (e.g. ParentPLUS loans).

- ○ Yes
- ○ No
- ○ Don’t know

What is your approximate amount of all your student loans, both federal and/or private student loans, for both your undergraduate and/or graduate education, that you owe for your own education as of today?

- ○ Student loan balance ($) _____
- ○ Don’t know

If “Don’t know”:

Which of the following categories best describes the approximate amount of all your student loans, both federal and/or private student loans, for both your undergraduate and/or graduate education, that you owe for your own education as of today?

- ○ None ($0)
- ○ $1-4,999
- ○ $5,000-9,999
- ○ $10,000-14,999
- ○ $15,000-19,999
- ○ $20,000-29,999
- ○ $30,000-39,999
- ○ $40,000-49,999
- ○ $50,000-99,999
- ○ $100,000 or more
- ○ Don’t know

In February 2020, prior to the start of the COVID-19 pandemic, do you remember what kind of repayment plan you were enrolled in?

- ○ None, I was still in school
- ○ Standard Repayment Plan: Make the same payment amount every month for 10 years
- ○ Graduated Repayment Plan: Payment amounts start low and increase every two years. Loans are paid off within 10 years
- ○ Extended Repayment Plan: Make a payment amount every month for longer than 10 years (up to 30 years)
- ○ Income-Driven Repayment Plan (IDR): Monthly payment amounts are tied to your income and family size
- ○ None, Loans were in default
- ○ Don't know

In March 2020, the federal government announced that federal student loan payments and interest would be temporarily paused for most borrowers as part of the pandemic assistance efforts and this "payment pause" is still in place.

Prior to this taking this survey, were you aware that the federal government paused payment for most federal student loans?

- ○ Yes
- ○ No

During the payment pause related to the COVID-19 pandemic, have you continued to make payments on your federal student loan(s)?

- ○ Yes, I am still required to make monthly payments
- ○ Yes, I voluntarily make full payments each month
- ○ Yes, I voluntarily make partial or full payments when I can, but not every month
- ○ No, I haven't made any payments since payments were paused
- ○ Don't know

What kind of repayment plan are you currently enrolled in?

- ○ Standard Repayment Plan: Make the same payment amount every month for 10 years
- ○ Graduated Repayment Plan: Payment amounts start low and increase every two years. Loans are paid off within 10 years
- ○ Extended Repayment Plan: Make a payment amount every month for longer than 10 years (up to 30 years)
- ○ Income-Driven Repayment Plan (IDR): Monthly payment amounts are tied to your income and family size
- ○ Don't know

The current payment pause is expected to end in August 2022.

To what extent do you agree with the following statement: When student loan payments start again in September 2022, I will be able to afford the same monthly amount that I was paying prior to the payment pause related to the COVID-19 pandemic.

- ○ Strongly Agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Disagree
- ○ Strongly disagree

On the next page, you will be shown a short article that features a statement about the likelihood of student loan forgiveness. Then you will be asked some questions about the article you were shown.

If Treatment 1:

President Biden signaled to House Democrats that he is **seriously considering taking action to forgive student-loan debt on a large scale**, according to congressional aides and others familiar with the discussions.

Following a meeting with the president at the White House, members of the Congressional Hispanic Caucus said they felt confident that Mr. Biden is warming to calls from progressive Democrats to take executive action to erase at least some of the debt held by borrowers with federal student loans. The president told the lawmakers that he was weighing the timing of any announcement.

Edited for brevity and readability

If Treatment 2:

President Biden would be on **shaky legal ground if he were to pursue broad-based student debt cancellation** by executive action, President Barack Obama's former top Education Department lawyer wrote in a legal analysis.

Using executive action to cancel debts for student borrowers without tying relief to their individual needs and using regulatory procedures would put the Biden administration at risk of having its plan overruled in court, according to a legal analysis prepared by Charlie Rose, who served as the top lawyer in the Education Department under President Obama from 2009 to 2011.

Edited for brevity and readability

In the following questions, we will ask you to think about the percent chance of something happening in the future.

Your answers can range from 0 to 100, where 0 means there is absolutely no chance, and 100 means that it is absolutely certain.

For example, numbers like: 2 and 5 percent may indicate "almost no chance" 18 percent or so may mean "not much chance" 47 or 52 percent chance may be a "pretty even chance" 83 percent or so may mean a "very good chance" 95 or 98 percent chance may be "almost certain"

What do you think is the percent chance that the repayment pause will be extended again beyond August 2022?

	0 10 20 30 40 50 60 70 80 90 100
%	

What do you think is the percent chance that **AT LEAST SOME of your** student loan debt will be forgiven.

	0 10 20 30 40 50 60 70 80 90 100
% in the next year?	
% in the next 2-5 years?	
% in the next 10+ years?	

Which fraction of your student loan do you think will be forgiven?

	0 10 20 30 40 50 60 70 80 90 100
% over the next year?	
% over the next 2-5 years?	
% over the next 10+ years	

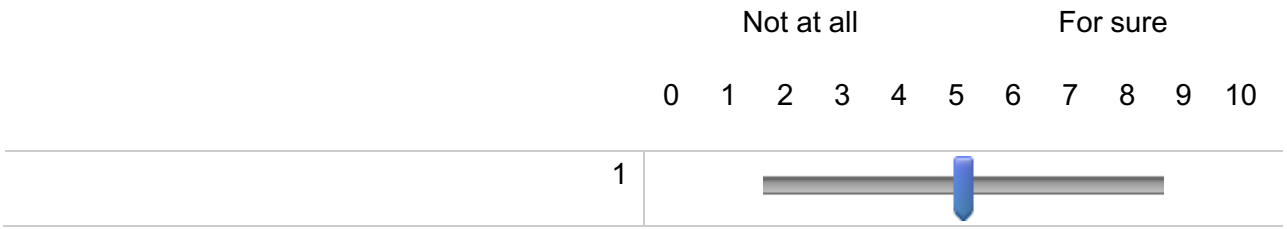
If student loan forgiveness is announced, what dollar value of student loans do you think will be forgiven?

- ○ Dollars ($) _____
- ○ Don't know

Approximately how much savings do you have available in your bank accounts?

- ○ None ($0)
- ○ $1-4,999
- ○ $5,000-9,999
- ○ $10,000-14,999
- ○ $15,000-19,999
- ○ $20,000-29,999
- ○ $30,000-39,999
- ○ $40,000-49,999
- ○ $50,000-99,999
- ○ $100,000 or more
- ○ Don’t know

How likely are you to vote in the midterm elections in November 2022?



In the Congressional elections in November 2022, which party are you likely to vote for?

- ○ Democrat
- ○ Republican
- ○ Not sure

D.2 Survey Intentions, April-July 2023

Display This Question:

If If What is your approximate amount of all your student loans, both federal and/or private student lo... Text Response Is Greater Than or Equal to 10000

Suppose you received student loan forgiveness of $10,000 in July 2023. How many dollars would you allocate to each of the following this year?
To pay off debts: : _____ (1)
To new spending: A house/ apartment : _____ (2)
A car or other vehicle : _____ (6)
A large home appliance or electronics : _____ (5)
All other spending: : _____ (4)
Amount saved: : _____ (3)
Total : _____

Display This Question:

If If What is your approximate amount of all your student loans, both federal and/or private student lo... Text Response Is Less Than 10000

Suppose your student loans are completely forgiven in July 2023. How many dollars would you allocate to each of the following this year?
Pay off debts: : _____ (1)
New spending this year: A house/apartment : _____ (2)
A car or other vehicle : _____ (3)
A large home appliance or electronics : _____ (4)
All other spending: : _____ (5)
Amount saved: : _____ (6)
Total : _____

Are you currently employed?

- ○ Yes, full time (1)
- ○ Yes, part-time, but want full-time (2)
- ○ Yes, part-time by choice (3)
- ○ Student and not employed, or employed part-time (4)
- ○ No, unemployed and looking for work (5)
- ○ No, not employed, not a student, and not looking for work (6)

Display This Question:

If Are you currently employed? = Yes, full time

Or Are you currently employed? = Yes, part-time, but want full-time

Or Are you currently employed? = Yes, part-time by choice

Or Are you currently employed? = Student and not employed, or employed part-time

If up to $10,000 in your student loans are forgiven in July 2023, would you change work hours in your current job(s) or possibly a new job?

- ○ No, I would not change my hours or job (1)
- ○ I will try to increase my work hours in my current job (2)
- ○ I will try to decrease my work hours in my current job (3)
- ○ I will look for a new job more actively (4)
- ○ I will look for a new job with about the same effort (5)
- ○ I will look for a new job less actively (6)

Display This Question:

If Are you currently employed? = No, unemployed and looking for work

Or Are you currently employed? = No, unemployed and looking for work

If up to $10,000 in your student loans are forgiven in July 2023, would you change your effort in looking for a job?

- ○ I will look for a job more actively (1)
- ○ I will look for a job with about the same effort (2)
- ○ I will look for a job less actively (3)

E Numerical solution method

In this appendix, we describe the numerical solution method use to solve the model in section 6. The solution method proceeds recursively to solve optimal repayment and consumption paths given agents' beliefs. First, we set the household's utility function $u(\cdot)$ and other parameters, including the number of periods T, the income flow vector $\mathbf{y} = (y_1, ..., y_T)$, the initial student loan amount B_0, household expected forgiveness vector $\mathbf{F} = (F_1, ..., F_T)$, the interest rate of the student loan r_b, the intertemporal saving (and potential borrowing) rate r_s, and the time preference β. We also set the indicator vector for the zero-interest rate period.

In each period, if the forgiveness amount is larger than the remaining balance plus the interest accrued, then no payment will be made in this period and afterward. This process interates until the loan is fully reimbursed. If payment is still needed, we adjust the balance after the forgiveness but before payment as the previous-period balance plus the interest accrued and minus the expected forgiveness:

$$B_{t^-} = B_{t-1} \cdot (1 + r_b \times 1[t \notin \text{zero-interest rate period}]) - F_t, \forall t \in [1, ..., T]$$

During the initial zero-interest rate period during which borrowers are enrolled or in grance, no interest implies that no payments are optimally made on the student loan. Following the zero-interest rate period, when the household needs to pay down the loan as the corresponding payment scenario suggests, the payment in period t is calculated using the standard amortization formula:

$$b_t = B_{t^-} \frac{r_b(1 + r_b)^{T-t}}{(1 + r_b)^{T-t+1} - 1}$$

Finally, we update the balance after the payment as

$$B_t = B_{t^-} - b_t$$

Having the payment flow vector in hand, we proceed to solve for the optimal consumption under each scenario. If we allow intertemporal borrowing at the rate r_s, we set $BC = \{0, T\}$ and obtain the optimal consumption as above without the need to check the budget constraint in each period.

Upon the forgiveness realization, all uncertainty is resolved, and the borrower reoptimizes based on the now certain remaining flow of payments. Optimal consumption is now the standard case with no uncertainty, and is trivial to calculate analytically. For borrowers who chose the 20 year payment plan, we allow the borrower to switch to a 7 year repayment plan following the "no forgiveness" realization.