

The Marginal Propensity to Consume Out of Student Debt Relief*

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Abstract

I calculate the marginal propensity to consume student debt relief in a quantitative precautionary savings model. The fiscal expense of debt forgiveness is large and immediate, while the benefits free resources from recurring future debt payments, which reduces stimulus effects. By contrast, temporary forbearance that suspends current payments delivers immediate liquidity and produces MPCs close to those of cash transfers. Targeting a one-time transfer to indebted individuals rather than to all individuals raises the MPC by about 50 percent. The MPCs from debt relief are less than one third that of one time cash transfers, and less than one fifth that of cash transfers to indebted individuals, while forbearance nearly matches the effectiveness of transfers to indebted households.

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1 Introduction

Canceling student debt is the single most effective executive action available to provide massive consumer-driven stimulus, providing relief to millions who are struggling during this recession and resulting in greater home-buying rates and housing stability, expanded access to more affordable financial products, higher college completion rates, higher incomes and increased geographic mobility, job creation and higher GDP, and greater small business formation.

Senators Charles Schumer and Elizabeth Warren, 2021

In this paper, I evaluate the potential stimulus of student debt relief using three key principles - it should be targeted, timely, and temporary. Debt forgiveness is well targeted as borrowers are disproportionately liquidity-constrained. It is also timely, since resources used in current debt payments can be freed for consumption. However, debt forgiveness fails to be temporary. Cancellation of student debt spurs an increase in government debt, but the benefits to borrowers are spread into freed resources from decreased payments each period rather than into a single windfall. By contrast, forbearance policies reduce current payments, making them both temporary and timely. Such policies preserve targeting to indebted households but deliver immediate liquidity.

I build a quantitative precautionary savings model of the life-cycle that incorporates exogenous student debt payments as a recurring expense. The model features an impatient individual subject to uninsurable idiosyncratic income risk, a retirement savings motive, and student debt payments. In evaluating debt relief policy, I assess the fiscal cost of discharging debt by estimating the increase to the current government deficit. Under current law, the entire cost of debt cancellation is added to the deficit in the year of cancellation¹. I estimate this cost using the present value of remaining debt payments of the individual to the government. The marginal propensity to consume student debt forgiveness is small, less than a third of that out of direct cash transfers, and less than one fifth out of cash transfers targeting indebted households. In contrast, the marginal propensity to consume student debt relief from forbearance falls between the two transfer experiments.

The model replicates key facts for US households that influence the marginal propensity to consume debt relief — wealth, indebtedness, and the capability to repay debt. I use the

¹A CBO report (Swagel, 2022) in response to President Biden’s executive order to cancel student debt in August 2022 details how debt cancellation is accounted for in the federal budget.

Survey of Consumer Finances' (SCF) household data to estimate savings at retirement, credit card access, and the distribution of liquid wealth relative to labor income. The Beginning Postsecondary Students Longitudinal Study (BPS) gives statistics on the initial level of debt and income for both those that graduated from college and those that started college but left without a degree. Earnings risk is chosen to match observations on income from the Panel Study of Income Dynamics (PSID) using Meghir and Pistaferri (2004).

Counterfactual experiments implement debt relief in the calibrated model to assess effectiveness as stimulus. I first analyze the impact of a direct cash transfer to both indebted and debt-free individuals. The average MPC in response to a direct transfer equals 29 percent. Targeting only indebted individuals in the model with direct transfers as a form of debt relief results in a higher MPC of 42 percent. Empirical estimates through using survey instruments (Shapiro and Slemrod 1995, 2003, 2009) or through analyzing consumption data (Souleles 1999; Johnson et al. 2006; Johnson et al. 2013; Karger and Rajan 2020) compute the range for average MPCs out of fiscal transfers between 20 to 50 percent. The average MPCs from both direct transfer experiments in this paper fall within this range, and targeting indebted individuals appears especially effective as stimulus.

After establishing this baseline, a series of experiments implement different levels of student debt forgiveness. I examine both partial and total debt forgiveness policies, as well as an experiment that implements debt forgiveness according to Pell grant recipient status using the (now defunct) student debt relief plan announced in August 2022. All three forgiveness experiments produce average MPCs near 9 percent, around a third of the 29 percent from direct transfers. The MPC is low in comparison to transfers, as the cost of forgiveness uses the present value of future payments. While future repayment is accounted for in the cost, individuals only have access to a small amount of the benefit from a relief in the payment today. This emphasizes the temporary aspect necessary for effective fiscal stimulus. While indebted individuals might be relevant for targeting, debt relief relies on smaller reduced stimulus each period from reduced payments, rather than a single temporary boost. To highlight this distinction, I also evaluate debt forbearance policies that reduce or suspend payments only in the current period. Unlike forgiveness, forbearance delivers its benefits entirely as immediate liquidity. Reducing required payments based on income generate an MPC on par with the universal transfer at 0.27, while suspending payments give an average MPC of 0.33 which lies between the transfer experiments.

Recent studies examine how households respond to changes in student debt and student

debt payments. Lourie et al. (2023) exploit the CARES Act’s payment moratorium to study temporary relief from required student-loan payments and show that borrowers covered by the pause increased consumption relative to comparable borrowers who continued paying. Dinerstein et al. (2023) argue that forbearance is more fiscally efficient than transfers because it defers rather than cancels obligations, with much of the cost later recouped during repayment. They also document increases in other borrowing (credit cards, auto loans, mortgages) during the pause, signifying an increased consumption response. My results support these, as I find forbearance almost as effective as transfers, producing large consumption responses. Katz (2023) also notes the fiscal advantage of forbearance, but finds empirical evidence for non-fungibility from relief, as liquidity from the payment pause was often used to continue to pay down student debt.

This paper extends that literature by contrasting temporary forbearance with permanent forgiveness. Individuals are likely to react differently when they face the absence of a payment only in the current period, knowing obligations will resume, versus a permanent reduction in future payments. Given discourse among policymakers, understanding the consumer response to debt relief policy is necessary, especially if the policymaker is interested in fiscal stimulus effects. This paper seeks to provide both insight and an estimate on how consumption might change relative to the fiscal cost of various debt relief policies. It contributes by providing student debt policy counterfactuals that evaluate a permanent decrease in debt payments as well as a temporary pause, and evaluates aspects of their effectiveness for stimulus. The results show that, in terms of the three criteria for effective stimulus—targeted, timely, and temporary—student debt forgiveness fails the temporary test, while forbearance satisfies all three.

The remainder of the paper is organized as follows. Section 2 presents the model, and Section 3 describes the calibration. Section 4 analyzes the results of the model and of different debt relief policy experiments. The final section concludes.

2 The Model

Individuals enter the workforce with different schooling histories. While some people have dropped out of high school to join the workforce early, others may have graduated high school, attended college courses, or graduated from college with a degree. Those who attended college might carry student debt. Each year individuals in the workforce earn wages from working,

and spend their financial resources on consumption, student debt payments, and savings. An individual retires and lives off of resources from accumulated assets and public pensions.

I focus on one aspect of an individual’s life after joining the workforce, the repayment of student debt. Repayment begins shortly after exiting school. In the United States, the Department of Education offers student debt repayment plans that differ in required minimum payments. Some of these plans amortize debt over a set period, while other plans tie payments to income. Student loan borrowers are automatically enrolled in the default repayment plan that amortizes student debt over 10 years. Borrowers may temporarily postpone repayment and extend the amortization period when providing public service, enduring economic hardship, or continuing schooling. One government policy offered is a form of mandatory forbearance called “Student Debt Loan Burden”, where distressed borrowers are allowed to decrease their payment below their normally required minimum payment.

I present a precautionary-savings life-cycle model that resembles the experiences of individuals described above. The model captures the key decisions they face about consumption and saving while repaying student debt. An individual is born at time $t = 21$ and lives until T^* , corresponding to ages 21-65. The individual can save at the risk-free rate, or borrow at a higher interest rate when asset holdings become negative². The individual derives utility from both consumption each period and a warm glow from end-of-life wealth, which captures the retirement motive while keeping the model centered on the years of student debt repayment.

Student debt follows an exogenous process, where individuals cannot prepay their debt nor acquire more debt, and repayment is not a choice. Each individual’s debt status follows a stochastic process. An individual may begin life indebted or debt-free, and indebted individuals face a probability of discharge each period. This specification reflects a stylized version of standard undergraduate loan repayment in which borrowers expect to continue making payments until their loans are fully repaid or discharged, without refinancing or taking on new educational debt. This abstraction captures the experience of young borrowers repaying undergraduate loans under the default federal plan, rather than individuals who expect to return to school or borrow again for graduate education. The inability to prepay debt is not a concern, as individuals take advantage of the favorable interest rate to instead save. I similarly ignore defaulting or not repaying debt, as individuals not making debt payments

²This is a simple way of introducing credit into the model (Carroll, 2001). This simple structure captures both the availability of credit and the tendency of borrowers to deleverage following debt forgiveness, as observed empirically (Maggio et al., 2019).

receive no stimulus from a reprieve of making payments. I focus on default repayment as it is most relevant for the MPC³. While alternative enrollment in income-driven repayment plans are on the rise, it remains concentrated among older borrowers and those with higher debt balances, especially graduate students⁴.

Individuals in the model take labor income and student debt payments as given and choose consumption and savings each period, while facing risk over income, life expectancy, and debt dischargement. The individual maximizes expected lifetime utility from consumption and end-of-life wealth:

$$\max_{\{C_t, A_{t+1}\}_{t=21}^{T^*}} \mathbb{E} \sum_{t=21}^{T^*} \beta^{t-21} \left(\prod_{j=21}^t (1 - \mu_j) \right) \left(\frac{C_t^{1-\gamma}}{1-\gamma} \right) + \mathbb{1}\{t = T^*\} \frac{\phi(A_{T^*+1} + Q_{T^*})^{1-\gamma}}{1-\gamma}$$

subject to

$$\begin{aligned} \tilde{A}_{t+1} &= A_t - C_t + Y_t - D_t \\ A_{t+1} &= \mathbb{1}\{\tilde{A}_{t+1} > 0\} R \tilde{A}_{t+1} + \mathbb{1}\{\tilde{A}_{t+1} < 0\} R^C \tilde{A}_{t+1} \\ A_t &\geq \underline{A} \quad \text{for } t = 0, \dots, T^*. \end{aligned}$$

Let Y_t denote labor income in period t , C_t consumption, D_t a student debt payment, and A_t the individual's beginning-of-period financial assets. End-of-period assets $\tilde{A}_{t+1}$ earn interest at rate R if positive and R^C if negative. Q_{T^*} represents the present value of Social Security benefits at the end of life, and ϕ governs the utility weight on retirement wealth. The probability of dying in year j is μ_j . If death occurs before T , any accumulated assets and remaining debt transfer to the fiscal authority.

³Partial debt forgiveness reduces current debt payments when repayment is tied to the outstanding balance. Since income-driven repayment determines payments by income, such forgiveness will leave current payments unchanged, unless the full balance is forgiven.

⁴According to the Federal Student Loan Portfolio published by the office of Federal Student Aid, of the approximate 22 million borrowers age 35 and younger in Q3 2023, only about 3.1 million borrowers were enrolled in income driven repayment plans.

Labor income evolves according to the following stochastic process:

$$\begin{aligned}
Y_t &= Y_t^P Y_t^T \\
\ln Y_t^P &= \ln \Gamma_t + \ln Y_{t-1}^P + \varepsilon_t^P \\
\ln Y_t^T &= \varepsilon_t^T + \theta \varepsilon_{t-1}^T \\
\varepsilon_t^P &\sim \mathbb{N}\left(-\frac{\sigma_P^2}{2}, \sigma_P^2\right) \\
\varepsilon_t^T &\sim \mathbb{N}\left(-\frac{\sigma_T^2}{2}, \sigma_T^2\right)
\end{aligned}$$

Income consists of a permanent component Y_t^P that evolves with deterministic growth Γ_t and permanent shocks ε_t^P , and a transitory component Y_t^T that follows an MA(1) process with shocks ε_t^T .

Individuals in the model can either be indebted or be debt-free. Let X_t indicate debt status, where $X_t = 1$ if the individual has debt in period t and $X_t = 0$ if debt-free. At the end of each period, with probability λ indebted individuals become debt-free, discharged from any remaining student debt. Once discharged, they remain debt-free forever. Indebtedness evolves as

$$\begin{aligned}
\Pr(X_{t+1} = 0 \mid X_t = 1) &= \lambda, \\
\Pr(X_{t+1} = 0 \mid X_t = 0) &= 1.
\end{aligned}$$

Indebted individuals make student debt payments D_t , which follow a fixed schedule but cannot exceed a set fraction of income. When $X_t = 1$, the individual owes a student loan payment D_t given by

$$D_t = \min\{\delta, \Psi Y_t^P\},$$

where δ is the standard-plan fixed payment and ΨY_t^P caps repayment at a share Ψ of permanent income. This restriction captures policies such as mandatory forbearance and ensures that individuals facing negative income shocks do not devote their entire income to debt repayment.

The sum of income Y_t , the debt payment D_t , and the beginning of period financial assets A_t constitutes the total resources available to the individual during the period. From the available resources, the individual chooses a level of consumption and next period's financial

assets. The individual is allowed to borrow up to the constraint $\underline{A}$ in order to increase the available level of resources in a period.

I solve the model using backwards induction starting in the final period of life. Homotheticity of preferences ensures the problem is scale free. Normalizing by permanent income eliminates one of the state variables, which greatly reduces the computation burden of the solution. I divide all monetary variables in the model by permanent income, so individuals now choose normalized consumption $\hat{C}_t = \frac{C_t}{Y_t^P}$. During simulation of the model, original variables can be recovered through multiplying by an individual's permanent income component.

3 Calibration

When considering debt relief, the salient facts of the data that will influence the MPC are the typical indebtedness upon leaving school, the income processes that govern capabilities of making debt payments, and the distribution of liquid wealth. I calibrate the model to match U.S. household data on these facts for individuals aged 21–65. I begin by discussing the assignment of initial conditions. I next review parameter I choose to match characteristics of the data. I end with the discussion of the simulated cross-sectional distribution of the model, which is both used in the calibration of the final parameter and also for policy experiments. The full list of estimates and calibrations for the parameters are listed in Table 2 and Table 3.

I use eight calibrations of the model to capture observable differences in income and debt at the start of life, as well as the evolution of income over the life cycle. These individuals differ along three dimensions: educational attainment, initial student debt balance, and whether they have received a Pell grant. Each individual in the model begins life with a permanent income level and, if indebted, a fixed student debt payment. The distinction of Pell recipient status matters as the Biden Administration's student loan proposal were more generous to students who received Pell grants.

I use the 2019 American Community Survey (ACS) 5-Year Estimates Public Use Microdata Sample to obtain starting income values for high school dropouts and high school graduates that have not attended college. For these two groups, I take the average earnings for ages 21–25 as an estimate. I also use the ACS sample to estimate income growth rates for each of the eight individual types by fitting a quadratic polynomial across ages at five year increments for each type.

To calculate starting levels of permanent income and student debt for individual who attended college, I use the 2011/2012 cohort of the Beginning Postsecondary Students Longitudinal Study (BPS). Students are surveyed beginning in their first year of postsecondary education, and are followed up at the end of their third and sixth years after entry into postsecondary education. I use the followup survey from 2017. The sample separates into six categories by dividing respondents along three dimensions — whether respondents graduated with a degree or dropped out, whether they have any student debt, and whether they have received a Pell grant. I calculate the median annual salary in 2017 of respondents in each category to use as the starting permanent income for that group. For those indebted, I determine the median of the total amount owed in federal student loans for undergraduate education. From the value of these loans, I derive the implied fixed payment δ using the constant interest rate R and discharge probability λ , consistent with an expected amortization schedule that retires the loan.

For the income process, I use the estimated parameters from Meghir and Pistaferri (2004)⁵ to characterize income risk for high school dropouts, high school graduates, and college graduates. Table 3 contains the estimated parameters. Given authors do not separately estimate for college dropouts, I use the estimates for high school graduates for these individual as well. High school graduates face lower volatility for both transitory and permanent income risk than high school dropouts. College graduates confront high permanent income risk, consistent with the premise that higher returns from college education come with higher earnings risk. The model abstracts from heterogeneity arising from college course of study. I assign earnings and debt at the group level based on education and Pell status. Given that the model abstracts from within-group heterogeneity and focuses on group-level averages, variation across courses of study is unlikely to substantively influence the aggregate predictions. Little effect from changes in both the initial starting levels and in the income volatility suggest that the results are robust to this absence.

With regards to the exogenous debt process, the probability of being discharged from the student debt payment is set to match the average time to pay down student debt, 21.1 years.⁶ The fraction of income that induces forbearance in the model matches the government threshold necessary for receiving Student Loan Debt Burden mandatory forbearance, $\Psi = .20$. I set the degree of risk aversion, $\gamma = 1$, following Noussair, Trautmann, and van de Kuilen

⁵These estimates can be found on page 9 of their paper.

⁶This average is taken from a study conducted by One Wisconsin Institute (2013)

(2014).⁷ The interest rate for savings is set to match the risk free rate so that households face a four percent rate of interest, $R = 1.04$. The probabilities of dying each period are taken from the Social Security Administration’s Actuarial Life Tables for 2020. The expected present value of Social Security benefits at retirement Q_{T^*} is calculated using a formula that resembles the 2019 Primary Insurance Amount (PIA) formula⁸. I use the last five years of income to determine an individual’s average income.

To inform the remaining parameters that concern retirement, credit, and wealth, I use household data for the sample of ages 21-65 from the 2019 Survey of Consumer Finances. Because the model is solved in normalized variables, where quantities are expressed relative to permanent income, I first require a measure of after-tax labor income to discipline the calibration. I construct labor income net of labor tax by subtracting estimated FICA, Medicare, and federal income taxes from gross wages and salaries. The parameter that captures the utility of wealth brought into retirement ($\phi = 1.8732$) is set to match the median ratio of financial wealth net of credit card debt to after-tax labor income for the sample of 61-65 year-olds.

Aside from student debt, credit cards are the primary source of unsecured borrowing for households. The interest rate on credit R^c is calculated by matching the median interest rate for credit cards being used by households. The borrowing limit $\underline{A}$ is determined by calculating the ratio of the credit limit on credit cards (for households that have credit card limits), to after-tax labor income. This tells us how much a household can borrow relative to their income. To evaluate what $\underline{A}$ should be, I match the median household credit limit to capture the available credit for households in the SCF sample.

Finally, I measure the net financial wealth of households in the sample as the total financial wealth, net of credit card balances. Using this wealth, I take the ratio to after-tax labor income in order to get net wealth in years of labor income. The last parameter to determine is the discount factor β . I follow a procedure other authors that investigate the MPC use (Campbell and Hercowitz, 2019), and calibrate $\beta = .941$ so that the median net liquid wealth to current labor income in the simulated cross-section of the model matches the median net financial wealth to after-tax labor income ratio calculated in the SCF.

⁷The authors use a combination of experimental methods and linked financial data and find the coefficient of risk aversion for the representative individual to be close to one. This conclusion can be found on page 349.

⁸The Social Security Administration publishes a yearly formula for the PIA. This formula sums three percentages of sections of average earnings. These sections are determined by bend points, which vary by year.

I generate synthetic data that reflects the age, education, and debt distribution of the U.S. population. To do so, I use eight calibrations of the model differing in education, debt, and Pell status, and simulate data from these. To account for age demographics, I form cohorts of individuals by age, where each cohort consists of simulated individuals that have lived from age 21 to a particular age j . Cohort sizes are scaled to match the average U.S. population growth rate between 2000 and 2019, ensuring the simulated cross section reproduces the observed age structure. Aggregating across cohorts yields a synthetic cross-sectional population of individuals between ages 21 and 65 that I use for policy counterfactuals.

Table 1 displays the distribution of wealth-to-income in the data and in the model. The full sample of ages 21-65 is given, as well as subsamples for subsets of ages. For each grouping, the 10th, 50th, and 90th percentiles are presented. For the full sample, the model accurately captures the 10th percentile and 50th percentile of the data. However, the model's 90th percentile falls short of the data. This pattern is repeated in both the younger (21-35) and older (51-65) subsamples, while the middle subsample (36-50) closely matches the data. Although the right tail of the model's distribution falls short, it's unlikely to matter for the question at hand, as these individuals are least likely to have a high MPC.

Figure 1 depicts the average life cycle paths for consumption, assets, and debt value at each age. Each variable in the figure is normalized by the current level of permanent income. Income is flat over the course of the life cycle, as the deterministic growth component of income is accounted for in the normalization. Consumption tracks income closely early in life. As retirement approaches, individuals consume more relative to their income, as consumption continues to grow even as income begins to fall. Individuals' normalized wealth grows over the life cycle as the precautionary motive drives the individual to protect against adverse income realizations, and to save for retirement. As the individual ages, those that were lucky with realizations of income spend down their wealth. I calculate the market value of debt as the value of the security that pays off an individual's debt payments, using the constant interest rate R and discharge probability λ . The path for average market value of debt is decreasing over the life cycle. This is due to both borrowers being discharged from their debt, and also the value of the debt itself decreasing as individuals make payments.

4 Results

I now perform seven policy experiments consisting of direct cash transfers, student debt forgiveness, or student debt forbearance. For each experiment, I calculate average MPC estimates across individuals within each decile of normalized wealth in the simulated cross-section. I determine the average MPC for each policy as the ratio between the average change in current consumption by individuals, and the average cost of the policy.

Figure 2 displays the average MPC calculations for all seven experiments. The first experiment I perform is a one time cash transfer of \$1000 to all individuals. The cost of the policy is equal to the amount of the transfer. The average MPC of the first decile is around 0.58. There is a small jump in the second decile to about 0.62, after which the average steadily declines before flattening around 0.12. If the analysis excludes the second decile, then the relationship between the MPC and wealth follows the pattern in which the MPC declines with normalized wealth. Individuals in the first decile are liquidity constrained, as they borrow up to the borrowing constraint - they would like to borrow more. The second decile straddles 0.0, where there is a kink allowing individuals to borrow at higher interest rate than if they save. This hump disappears if the interest rate to borrow r^c is set at the savings rate r .

The second experiment is another one time cash transfer of \$1000, but now only to individuals that make student debt payments. The resulting average MPCs are similar than those of the previous experiment. The MPC of the first decile is just below 0.6, with a small jump in the second decile. The averages then decline before flattening around 0.12. Although this pattern resembles the first experiment, it does not suggest that targeting lacks effectiveness, as the distribution of individuals with student debt skews toward the first few deciles.

The next three experiments perform differing levels of debt forgiveness. Calculating the MPC requires defining the cost of implementing debt relief policy. The Federal Credit Reform Act of 1990 requires federal agencies to use present value cost estimation in accounting. During the disbursement of student loans, the present value cost accounts for the repayment of debt in the future. After debt cancellation, the original cost estimate needs to be revised to account for decreased repayment. The cost of debt cancellation adds to the deficit in the same year as a one-time revision to the net present value of government holdings.

I compute the market value of student debt as the net present value of future repayments, discounted by the constant interest rate r and weighted by the probability of discharge

λ . After decreasing this value by the amount of forgiveness, I calculate new implied debt payments, and then simulate an individual's future repayment before and after forgiveness. Simulations account for both regular dischargement of debt, and also reduced payments enforced by the forbearance payment cap. The present value of current repayment minus the present value of repayment after forgiveness defines the cost of debt cancellation.

In the first debt relief policy experiment, I implement partial debt relief by subtracting \$1000 from the market value of debt from all individuals with student debt (or all of the student debt of an individual if it is less than \$1000). Debt payments decrease to reflect this difference accordingly. The resulting MPCs seen in Figure 2 are different than those of the previous experiments, as they are relatively flat across the deciles of normalized wealth, hovering near 0.1, with a slight increase in later deciles. When debt is forgiven, the entire cost of cancellation is added to the government deficit upfront. However, the individual does not obtain a corresponding amount of freed resources for consumption. Instead, the benefits collect over time, in small amounts of each debt payment into the future. The fiscal expenditure for the debt relief is still quite large, so the MPC shrinks. Differences in consumption today are mitigated by the large cost, creating a leveling effect. The later deciles, which contain more older individuals, show a slight increase because fewer expected future repayments bring the value of reduced payments closer to the policy cost.

The next debt forgiveness experiment implements total debt relief, where individuals with student debt become debt-free. The results are nearly identical to partial debt relief. As in the third experiment with partial relief, the MPCs are relatively flat across wealth and smaller than those from the transfer experiments. This is due to the individual still only freeing up a small portion of resources compared to the large cost of the debt forgiveness.

For the last of the three debt forgiveness experiments, I implement the 2022 Biden Student Debt Relief Plan. Indebted individuals in the model who received a Pell grant receive \$20,000 in student debt relief if the market value of their debt exceeds \$20,000, and total debt relief otherwise. Individuals who never received a Pell grant only receive \$10,000 in student debt relief, or total relief if their market value is less than \$10,000. Once again, the MPCs from implementing this plan are almost identical to the other debt forgiveness policy experiments. The difference in MPCs between Pell and non-Pell recipients is close to zero, and this is likely due to similar initial states.

In the last two experiments I implement forbearance policies, where student debt payments are reduced for a single period. The fiscal cost of these policies equals the foregone

repayment in the current period. In the first forbearance experiment I set $\Psi = 0$, where the entire payment for a single period is suspended. The resulting MPCs are substantially similar to direct transfers. While slightly lower in magnitude compared to transfers in the first deciles, the MPCs follow the same pattern of declining with normalized wealth, only flattening in the second half of the wealth distribution. These results reflect the liquidity effect of forbearance: individuals immediately gain spendable resources without the offsetting large fiscal cost that depresses the measured MPC under forgiveness.

In the second forbearance experiment, I reduce the forbearance cap to $\Psi = .1$, limiting current payments to at most ten percent of permanent income. While this policy does not fully eliminate payments, it provides relief to individuals with high debt obligations relative to income. The MPCs resemble those of the first forbearance experiment, though slightly lower in the first few deciles. The individuals impacted by this experiment have low wealth and higher payments relative to permanent income. These individuals save slightly more to protect against additional negative income shocks.

Next I calculate the aggregate MPC in response to each policy for the entire simulated cross-section. I compute these aggregate estimates of the MPC for each policy by taking the total change in consumption of the simulated population and dividing by the total aggregate cost. The analysis presents estimates for both the entire age range, and the more narrow range of 21-35. These results are presented in Table 2. In response to a one time transfer to the entire simulated cross-section, including both indebted and debt-free individuals, the estimated MPC is about 0.27. This falls within the empirically estimated range of the MPC out of cash transfers. The MPC of a transfer to only indebted individuals is higher, at 0.42. While these two policy experiments give similar average MPCs within each normalized wealth decile, indebted individuals are more likely to be concentrated at the lower end of the normalized wealth distribution. In evaluating this policy as fiscal stimulus, targeting indebted individuals is effective, as it more likely targets liquidity constrained individuals. For ages 21-35, both cash transfer experiments see an increase in aggregate MPC. The increase is smaller in response to transfers to only indebted, as indebted individuals are more likely to be young. This age range is more likely to have low liquid wealth, as individuals are still building up a stock of assets for precautionary reasons, and is also an effective target for fiscal stimulus.

The MPCs for the three debt forgiveness experiments are essentially identical, hovering close to 0.09. Moreover, these aggregate MPCs are about a third of the MPC in response

to a cash transfer to all individuals, and about a fifth of the aggregate MPC in response to a cash transfers to only indebted individuals. While there might be a large fiscal expense immediately as debt is forgiven, individuals only gain access to a small portion of the benefits in resources today. The rest of these benefits continue in the future, and will not invoke a large stimulus response in the present. There is little change when restricting to the sample of young individuals.

The two debt forbearance experiments produce far larger average MPCs. The complete payment reduction ($\Psi = 0$) lands between the two transfer experiments at an average MPC of 0.33, while the reduced cap ($\Psi = .1$) gives the same response as the transfer to all individuals at 0.27. Restricting the sample to young individuals leads to a large increase in the average for both experiments, with the complete reduction at 0.54 and the reduced cap at 0.55. These averages are only slightly behind the response from transfers to indebted individuals in the young sample. The reasoning is similar — these young individuals have lower liquid wealth, and debt payments are a larger percentage of available financial resources in a period. In contrast to the debt forgiveness experiments, the benefit from payment reductions are fully realized in the current period of the forbearance experiment, leading to higher average MPCs. If the goal is to provide large short-run stimulus, canceling student debt is far less effective than direct transfers. By contrast, a one-time reduction in student debt payments comes close to the effectiveness of transfers to indebted individuals, and even surpasses a universal transfer to all individuals.

5 Conclusion

In this paper, I estimate the MPC using a variety of policy experiments aimed at relieving indebted individuals. I find that, in comparison to one-time transfers, debt forgiveness is not effective as fiscal stimulus. The intuition is straightforward, as nearly all of the benefits from debt forgiveness will occur in the future for the individual. In the current period, debt forgiveness only relieves a limited amount of current resources that can be used for consumption, as debt payments are lowered only a fraction of the total amount of debt relieved. This reduction continues each period in the future, as long as the individual was expected to make payments. In this way, debt relief fails the temporary aspect of effective fiscal stimulus.

By contrast, policies that focus on a reduction only in current payments deliver immedi-

ate liquidity and generate much stronger responses. The forbearance experiments produce average MPCs that are close to those of cash transfers, and in some cases nearly as large as transfers targeted directly to indebted individuals. This stands in sharp contrast with forgiveness, where the measured MPCs are only a fraction as large.

While the debt relief experiments fail the temporary aspect of effective fiscal stimulus, they seem to be correctly targeted. The aggregate MPC in response to cash transfers is more than 50% larger when targeting individuals making student debt payments. Similarly, the gains from forbearance are largest among young individuals with low liquid wealth and high debt burdens relative to income. Although not modeled here, one final aspect of forbearance might elevate it above transfers as stimulus — its timely nature. A payment pause to loan servicers might be issued more quickly than direct transfers to individuals, if it takes time for people to receive checks or deposits. Although Senators Schumer and Warren advocated for student debt cancellation to induce stimulus, a temporary payment pause would be far more effective. Unlike forgiveness, forbearance satisfies all three aspects of effective fiscal stimulus — it is targeted, timely, and in contrast with debt forgiveness, temporary.

References

- Campbell, J. R. and Hercowitz, Z. (2019). Liquidity constraints of the middle class. *American Economic Journal: Economic Policy*, 11(3):130–55.
- Carroll, C. D. (2001). A theory of the consumption function, with and without liquidity constraints. *Journal of Economic Perspectives*, 15(3):23–45.
- Dinerstein, M., Yannelis, C., and Chen, C.-T. (2023). Debt moratoria: Evidence from student loan forbearance. Working Paper 31247, National Bureau of Economic Research.
- Johnson, D. S., Parker, J. A., and Souleles, N. S. (2006). Household expenditure and the income tax rebates of 2001. *American Economic Review*, 96(5):1589–1610.
- Karger, E. and Rajan, A. (2020). Heterogeneity in the Marginal Propensity to Consume: Evidence from Covid-19 Stimulus Payments. Working Paper Series WP-2020-15, Federal Reserve Bank of Chicago.
- Katz, J. (2023). Saving and consumption responses to student loan forbearance. *SSRN Working Paper Series*.
- Lourie, B., Nekrasov, A., and Yoo, I. S. (2023). The impact of debt forbearance on borrowers’ financial behavior and labor outcomes: Evidence from student loans. *Finance Research Letters*, 57:104265.
- Maggio, M. D., Kalda, A., and Yao, V. (2019). Second Chance: Life without Student Debt. NBER Working Papers 25810, National Bureau of Economic Research.

- Noussair, C., Trautmann, S., and Kuilen, G. (2014). Higher order risk attitudes, demographics, and financial decisions. *The Review of Economic Studies*, 81(1 (286)):325–355.
- One Wisconsin Now (2014). Twenty to life: Higher education turning into multi-decade debt sentence.
- Parker, J. A., Souleles, N. S., Johnson, D. S., and McClelland, R. (2013). Consumer spending and the economic stimulus payments of 2008. *American Economic Review*, 103(6):2530–53.
- Schumer, C. E. and Warren, E. (2021). Administrative student debt relief one-pager. <https://www.warren.senate.gov/imo/media/doc/Administrative%20Student%20Debt%20Relief%20One-pager.Schumer-Warren.pdf>. Accessed: August 2025.
- Shapiro, M. D. and Slemrod, J. (1995). Consumer Response to the Timing of Income: Evidence from a Change in Tax Withholding. *American Economic Review*, 85(1):274–283.
- Shapiro, M. D. and Slemrod, J. (2003). Consumer response to tax rebates. *American Economic Review*, 93(1):381–396.
- Shapiro, M. D. and Slemrod, J. (2009). Did the 2008 tax rebates stimulate spending? *American Economic Review*, 99(2):374–79.
- Souleles, N. S. (1999). The response of household consumption to income tax refunds. *American Economic Review*, 89(4):947–958.

Swagel, P. L. (2022). Costs of suspending student loan payments and canceling debt. CBO Publication 58494, Congressional Budget Office, Washington, DC.

A Appendix

Table 1: Wealth-to-Income Ratios by Age Group and Percentile

	21-65			21-35			36-50			51-65		
	P10	P50	P90	P10	P50	P90	P10	P50	P90	P10	P50	P90
Data	-0.01	0.49	6.11	-0.04	0.22	1.18	-0.01	0.55	4.57	0	1.29	12.88
Model	-0.02	0.49	3.55	-0.06	0.01	0.50	0.04	0.57	4.41	0.7	1.63	7.77

Table 2: Average MPCs by Experiment

	One-Time Transfer: All	One-Time Transfer: Indebted	Partial Relief	Total Relief	Biden Plan	$\Psi = 0$	$\Psi = 0.1$
Ages 21-65	0.27	0.42	0.09	0.09	0.09	0.33	0.27
Ages 21-35	0.48	0.58	0.08	0.09	0.09	0.54	0.55

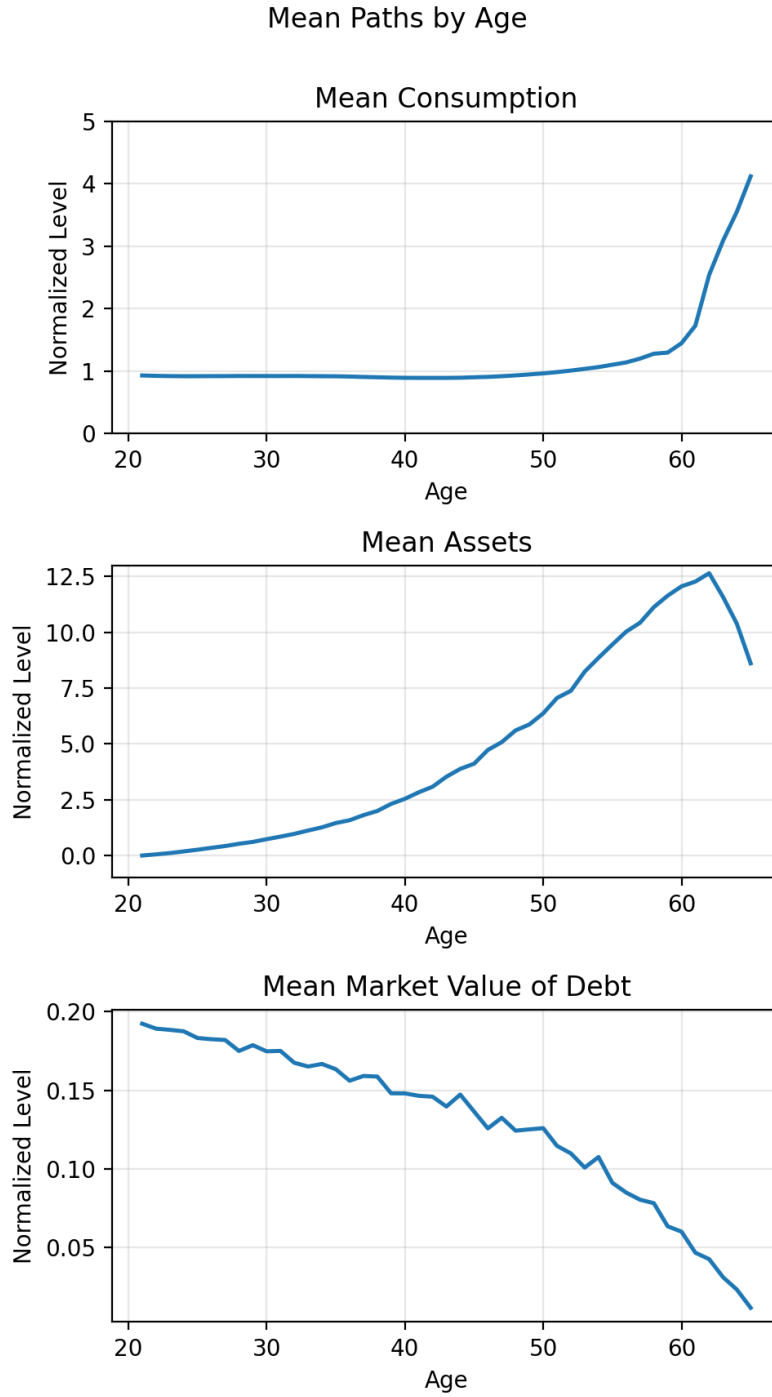


Figure 1: Average life-cycle paths of consumption, assets, and market value of debt between ages 21 and 65. All variables are expressed in units normalized by permanent income.

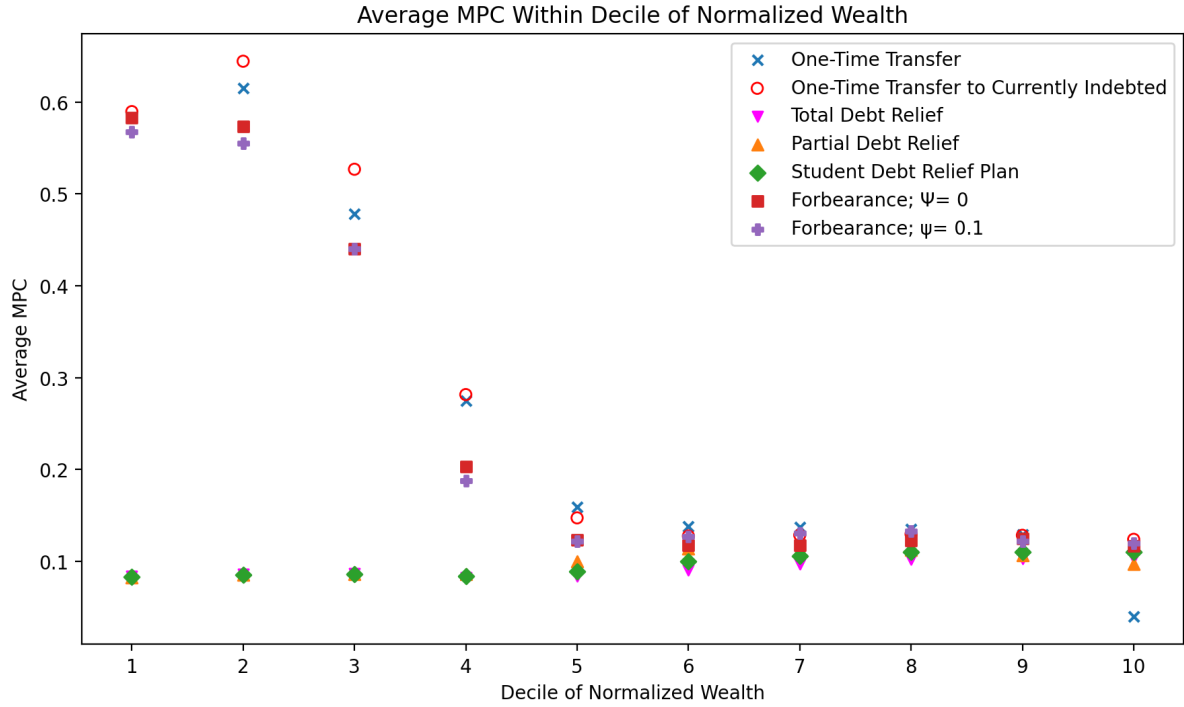


Figure 2: Average marginal propensities to consume (MPCs) across seven policy experiments. The figure compares cash transfers, student debt forgiveness policies, and temporary forbearance of student debt payments. The deciles of normalized wealth are calculated by dividing individuals' wealth by permanent income, and then calculating the aggregate deciles in the cross-section. Average MPCs are calculated by dividing the average change in consumption within a decile by the average cost of the policy within a decile.

Table 3: Calibrated Parameters

Param.	Value	Description
β	0.941	Discount Factor
γ	1	Degree of Risk Aversion
ϕ	1.87	Retirement Preference
r	0.04	Risk Free Rate
λ	1/21.1	Probability of Becoming Debt-Free
r^c	0.162	Interest Rate on Credit
$\underline{a}$	-0.27	Credit Borrowing Limit
σ_T	0.234	High School Dropout: Transitory Income Standard Deviation
σ_P	0.182	High School Dropout: Permanent Income Standard Deviation
θ	-0.2535	High School Dropout: Transitory Income Moving Average Coefficient
σ_T	0.163	High School Graduate: Transitory Income Standard Deviation
σ_P	0.166	High School Graduate: Permanent Income Standard Deviation
θ	-0.2674	High School Graduate: Transitory Income Moving Average Coefficient
σ_T	0.07	College Graduate: Transitory Income Standard Deviation
σ_P	0.209	College Graduate: Permanent Income Standard Deviation
θ	-0.5101	College Graduate: Transitory Income Moving Average Coefficient
$\aleph$	0.0078	Cohort Size Growth Rate
Ψ	0.2	Fraction of Income that Caps Debt Payments

Table 4: Household Starting Income and Debt Payments

Param.	Value	Description
δ_0^1	\$1,751	Implied Debt Payments: Indebted, College Grad, Pell Recipient
δ_0^2	\$2,709	Implied Debt Payments: Indebted, College Grad, Not a Pell Recipient
δ_0^4	\$806	Implied Debt Payments: Indebted, Left College, Pell Recipient
δ_0^5	\$641	Implied Debt Payments: Indebted, Left College Not a Pell Recipient
$Y_0^{P,1}$	\$28,000	Starting Permanent Income: Indebted, College Grad, Pell Recipient
$Y_0^{P,2}$	\$33,660	Starting Permanent Income: Indebted, College Grad, Not a Pell Recipient
$Y_0^{P,3}$	\$34,000	Starting Permanent Income: Debt Free, College Grad
$Y_0^{P,4}$	\$24,000	Starting Permanent Income: Indebted, Left College, Pell Recipient
$Y_0^{P,5}$	\$26,250	Starting Permanent Income: Indebted, Left College Not a Pell Recipient
$Y_0^{P,6}$	\$26,000	Starting Permanent Income: Debt Free, Left College
$Y_0^{P,7}$	\$16,313	Starting Permanent Income: High School Graduate, No College
$Y_0^{P,8}$	\$11,464	Starting Permanent Income: High School Dropout