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# THE DISTRIBUTIONAL EFFECTS OF STUDENT LOAN FORGIVENESS

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## ABSTRACT

We study the distributional consequences of student debt forgiveness in present value terms, accounting for differences in repayment behavior across the earnings distribution. Full or partial forgiveness is regressive because high earners took larger loans, but also because, for low earners, balances greatly overstate present values. Consequently, forgiveness would benefit the top decile as much as the bottom three deciles combined. Blacks and Hispanics would also benefit substantially less than balances suggest. Enrolling households who would benefit from income-driven repayment is the least expensive and most progressive policy we consider.



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# 1 Introduction

Education debt in the United States stands at $1.6 trillion in 2020, and is growing rapidly. Growing debt burdens have led to both increased calls for loan forgiveness, as well as recent policies forgiving debts for some borrowers.[1] At the same time, income and wealth inequality has led to concerns about the distributional effects of debt forgiveness. Many holders of high loan balances completed graduate and professional degrees, and consequently earn high incomes. Untargeted debt forgiveness policies could thus disproportionately benefit high earners. High earners, on the other hand, are likely to pay down debts earlier, and thus might have lower unpaid balances remaining, making debt cancellation less attractive to them. Which effect dominates is ultimately an empirical question.

Alleviating soaring student loan burdens by providing debt relief to borrowers has increasingly been discussed by policymakers, academics and the media. There are a number of ways in which debt can be discharged, with important distributional implications. For example, forgiveness can be universal, capped or targeted to specific borrowers. These debt cancellation policies can benefit different socioeconomic and ethnic groups. This paper explores their distributional impacts. We find that the benefits of universal debt forgiveness policies largely accrue to high-income borrowers, while forgiveness through expanding income-contingent loan plans instead favors middle-income borrowers.

It is well known that student loan balances and income are positively correlated.[2] However, student loan balances do not accurately represent the actual cost of forgiving student debt nor the distribution of benefits between low and high-income households. Many low-income families struggle making sufficient payments for their balance to decrease substantially –or at all– over time. However, to the extent that, under current law, their debt will ultimately be forgiven, their balance can greatly overstate the value of actual future payments, and therefore how much canceling their debt would benefit these families financially and how much it would

[1] There have been a number of recent policy proposals relating to student loan forgiveness. For example, see the *New York Times*, November 18, 2020 and *CNBC*, October 30, 2020. Significant student debt forgiveness also exists under current programs for public sector employees, teachers and for borrowers in income-driven repayment plans for more then twenty years. Amromin and Eberly (2016) and Avery and Turner (2012) provide a review of work on student loans.

[2] For example, the People's Policy Project and the Brookings Institution provide analysis of the relationship between student loan balances and earnings.

actually cost taxpayers.

While direct debt discharge has dominated many public discussions, much of the public discourse misses the fact that significant targeted debt forgiveness already exists in the United States for some borrowers. Importantly for most borrowers, Income-Driven Repayment (IDR) plans also offer substantial loan forgiveness to low-income borrowers who have balances remaining after twenty to twenty-five years, depending on a borrowers' specific plan.[3] In the meantime, IDR plans link payments to income, so borrowers with persistently low incomes will only reimburse a fraction of their debt before it is forgiven.[4] Increasing enrollment in IDR, or increasing these plans' generosity is another option for targeted debt forgiveness.

In this paper, we use the 2019 Survey of Consumer Finances (SCF) to estimate the present value of each loan. Specifically, we rely on detailed loan-level data to forecast future payments and the evolution of a loan's balance until it reaches zero or is forgiven. Our analysis takes into account the current balance and most recent payments, family size, earnings, and the number of years left before the loan is forgiven under current law. We define the present value as the sum of expected payments discounted at the risk-free rate. We use these estimates to explore the distributional impacts of forgiveness policies.

We first explore universal and capped forgiveness policies, either discharging all debt, or all debt amounts up to a cap. Loan forgiveness from these policies disproportionately accrues to high-income households. Under a universal loan forgiveness policy, in present value terms, the average individual in the top earnings decile would receive $5,944 in forgiveness, while the average individual in the bottom earnings decile would receive $1,070 in forgiveness. Individuals in the bottom half of the earnings distribution would receive one-quarter of the dollars forgiven. Households in the top 30% of the earnings distribution receive almost half of all dollars forgiven. Patterns are similar under policies forgiving debt up to $10,000 or $50,000, with higher-income households seeing significantly more loan forgiveness.

We then turn to a second form of loan forgiveness, through expanding IDR plans, which tie loan payments to income and forgive balances after a certain number of years in repayment.

[3] In addition to forgiveness under IDR, Public Sector Loan Forgiveness (PSLF) offers loan forgiveness to borrowers who work in the public sector or qualified non-profits for ten years, and Teacher Loan Forgiveness offers partial loan forgiveness to some educators.

[4] Under current IDR plans, borrowers pay 10-15% of their income above 150% of the federal poverty line. Outstanding balances are forgiven after twenty to twenty-five years in repayment.

We examine enrolling all borrowers who would benefit from IDR, and increasing the generosity of IDR by raising the threshold above which borrowers must pay a portion of their income, and by accelerating loan forgiveness. In contrast to universal forgiveness, expanding IDR leads to substantial forgiveness for the middle of the earnings distribution. Under a policy enrolling all borrowers who would benefit from IDR, individuals in the bottom half of the earnings distribution would receive three-fifths of dollars forgiven and borrowers in the top 30% of the earnings distribution receive one-fifth of dollars in forgiveness. Raising the threshold above which borrowers pay a portion of their income and earlier loan forgiveness both lead to a large increase in forgiveness, however under accelerating loan forgiveness these benefits accrue to the top of the earnings distribution, while increasing the repayment threshold leads to large benefits for middle-income borrowers.

This paper primarily joins a literature within household finance on student loans. This paper presents a framework for computing the present value of student loans, and uses it to present new results on the progressivity of loan forgiveness options. Amromin and Eberly (2016) and Avery and Turner (2012) discuss the conceptual framework for student loans and review the literature. Looney and Yannelis (2015) provide an overview of recent empirical trends in the student loan market, while Lochner and Monge-Naranjo (2011) and Caucutt and Lochner (2020) present theoretical models of education borrowing. Recent work has focused on student loans and housing (Goodman, Isen and Yannelis, 2020; Amromin, Eberly and Mondragon, 2016), the relationship between credit supply and tuition (Lucca, Nadauld and Shen, 2019; Kargar and Mann, 2018), enrollment (Solis, 2017; Sun and Yannelis, 2016), raising borrowing limits (Black et al., 2020), the role of institutional control on outcomes (Eaton, Howell and Yannelis, 2020; Armona, Chakrabarti and Lovenheim, 2017), loan discharge (Maggio, Kalda and Yao, 2019), racial gaps (Scott-Clayton and Li, 2016) as well as behavioral aspects of student loans (Cadena and Keys, 2013; Cornaggia, Cornaggia and Xia, 2019; Cornaggia and Xia, 2020; Marx and Turner, 2018; Mueller and Yannelis, 2020)

Within work on student debt, this paper links to a growing literature on IDR plans. Our paper shows that IDR plans are a useful tool for targeted loan forgiveness, and the benefits of this forgiveness largely accrue to middle-income individuals. Previous work has largely focused on the insurance benefits of IDR plans to borrowers, and selection into these plans. Mueller

and Yannelis (2019) show that IDR plans provided insurance to borrowers during the Great Recession. Herbst (2019) studies how IDR plans affect credit bureau outcomes and Britton and Gruber (2019) study the labor supply effects of IDR. Karamcheva, Perry and Yannelis (2020) discuss trends in IDR over time, and selection of borrowers in these plans. Despite significant pushes to increase the utilization of these plans, take-up remains low. Mueller and Yannelis (2020) show that administrative costs are a significant barrier to enrollment, which is consistent with college students not having information about financial aid options (Bettinger, Long, Oreopoulos and Sanbonmatsu, 2012; Hoxby and Turner, 2015).

The remainder of this paper is organized as follows. Section 2 discusses institutional background, the SCF data used in our main analysis and modeling the present value of student loan balances. Section 3 analyzes the distributional effects of loan forgiveness options, with a focus on income and ethnic heterogeneity. Section 4 concludes.

# 2 Value of Student Debt

## 2.1 Institutional Background

In 2020 there was approximately $1.6 trillion in outstanding student loan debt, according to the Federal Reserve Bank of New York. The vast majority of student debt in the United States is directly disbursed or guaranteed by the federal government. Modern federal student loan programs began in 1965, with the passage of the Higher Education Act. There have been two large federal student loan programs in the United States. The first was the Federal Family Education Loan Program (FFEL), which began in 1965, and which was terminated in 2010. The FFEL program was a guarantee program, under which private lenders provided capital for highly regulated loans. These funds were in turn guaranteed by the government. The William D. Ford Federal Direct Loan Program (DL) was authorized in 1992. Under the DL program, the US Treasury directly provides funds for student loans. Borrowers take either Subsidized or Unsubsidized loans. All borrowers are eligible for Unsubsidized loans, while borrowers from lower-income families are eligible for Subsidized loans. While the loans are quite similar, for Subsidized borrowers, interest does not accrue while borrowers are in school. Loan balances

were historically relatively small, and grew rapidly from 2000 onwards (Looney and Yannelis, 2019).

Federal student loans are highly regulated, with interest rates and borrowing limits set by Congress. Pricing does not vary based on risk, and all students of the same level face the same interest rate.[5] Borrowing limits vary by class level, and are higher for upper level and graduate students. Loans are serviced by private companies, with contracts from the Department of Education (Amromin and Eberly, 2016). If borrowers default on their loans, 15% of their their wages are garnished. Unlike other consumer loans, wages are garnished without a court order and are typically seized directly from payroll. Student loans are nearly impossible to discharge in bankruptcy, as borrowers have to prove a very stringent legal standard called "undue hardship."

Traditionally, most borrowers were in the Standard Plan. This plan is similar to a ten-year mortgage, and depending on the year could be fixed or variable rate. Some borrowers also choose the Extended Repayment Plan, which increases the loan maturity to twenty-five years. There are also a number of IDR plans, which all have the same basic features. IDR plans tie a borrower's loan payment to their income. Under these plans, borrowers pay ten or fifteen percent of their discretionary income. After twenty or twenty-five years, outstanding balances are forgiven. These have increased in popularity since 2009, following the introduction of the Income-Based Repayment (IBR) Plan.[6] Under IBR, borrowers pay 15% of their discretionary income, defined as income above 150% of the poverty line. Under most IDR plans, payment amounts are capped by a borrower's payment under the standard plan. Outstanding balances are forgiven after 25 years. Subsequently a number of more generous IDR plans were introduced, including the Pay As You Earn Plan and the Revised Pay As You Earn Repayment (REPAYE) Plan. Under these plans borrowers pay 10% of their discretionary income, and outstanding balances are forgiven after 20 years.[7] Most new borrowers in 2020 who choose IDR plans are in the new more generous plans. Borrowers are also able to stop payments through

[5]There are slight differences in effective interest rates based on whether borrowers are Subsidized or Unsubsidized. Additionally, in some years subsidized borrowers had lower interest rates. Interest rates also differ for graduate and undergraduate borrowers.

[6]Prior to the IBR plan, there was one IDR plan available, the Income-Contingent Plan. This was less generous, with borrowers paying 20% of their discretionary income and take-up was very low.

[7]The Department of Education provides information of details on various repayment plans.

deferment or forbearance for a number of reasons, including job-loss, returning to school, joining the military, or at a loan servicer's discretion.

## 2.2 Data

Our primary data source is the 2019 SCF. The SCF is a nationally representative survey conducted trienially by the Federal Reserve Board of Governors. The SCF surveys households on income, net worth, balance sheets, credit use, and financial outcomes including education debt. Crucially for our analysis, the survey contains information on household income and demographics, as well as detailed information on student loan balances, interest rates and repayment. Importantly, the SCF includes information on whether borrowers are in IDR plans. Bhutta et al. (2020) provide a detailed description of the 2019 SCF, with a discussion of student borrowing. We include individuals between the ages of 22 and 60 in our main analysis sample, and only include student loans in repayment. Due to the lack of granularity of the SCF, some households represent several centiles of the earnings distribution within a cohort and span over two deciles, in which case we allocate them on a proportional basis. Appendix table A.1 provides a list of the main analysis variables used.[8]

Our analysis compares all individuals in the SCF and individuals with student debt. We have 5,777 households in the sample, and 1,052, or 22% after accounting for survey weights, have education debt. In our analysis of student loan borrowers, we restrict the sample to borrowers who left college and are left with 845 households with debt. We take this restriction as our method of computing present values relies on observing initial repayment behavior. All estimates are weighted using SCF survey weights, to ensure that the estimates are nationally representative. Table 1 shows summary statistics for the main analysis sample, split by individuals with and without student debt.[9] The typical borrower in our sample left school in 2011, and their loan has an interest rate of 5.9%. The average household income for individuals

[8]The SCF has some limitations regarding student debt. In particular, it undercounts student debt aggregates relative to administrative sources as it only counts debt of the core economic unit of the household. Thus some individuals, such as adult children living with parents, many not be counted in student debt aggregates. This leads to the aggregate student debt about in the 2019 SCF being $1.2 trillion, which is lower than administrative sources. Approximately one-third of this debt is held by individuals still in school.

[9]Due to the sampling design of the SCF, standard procedures for variance estimation cannot be applied. This does not affect our analysis.

with student debt who left school is $97,300. In our sample, the mean income of individuals without student debt is slightly higher, but this reflects a highly skewed distribution. The median income of student loan borrowers is $71,300, while the median income of the full sample is $59,100. The average student loan balance, conditional on having any education debt, is $41,400 in the 2019 SCF, up from $36,400 in the 2016 survey. 40% of borrowers are in IDR plans.

Figure 1 shows the share of households between age 22 and 60 with student debt (Panel A), the mean balance (Panel B) and yearly payment (Panel C), by within-cohort decile of earnings, along with a 95% confidence interval. While the relationship is non-monotonic, on average higher income households are more likely to have student debt, and have higher student loan balances conditional on borrowing. Importantly, yearly payments increase relatively much faster with earnings than balances. The average balance of borrowers in the top decile is only 17% larger than those in the bottom decile. But their payments are nearly four times larger. Because there is such a difference in repayment behavior, it is essential to compute present values to estimate how much low earners would actually save as a result of debt forgiveness.

## 2.3 Computing Present Values

The outstanding balance of a loan does not give its true present value, which depends on interest rates, maturity and discount rates. Put simply, the value of a loan reflects the timing of payments and how much future dollars are worth today. Assuming that non-repayment is caused by idiosyncratic risk, the present value of a loan is the sum of expected future payments discounted at the nominal risk-free rate $r_f$. Specifically, we denote the present value of loan $l$ of household $i$ in year $t$:

$$\text{Present value}_{ilt} = \sum_{k=t} \frac{\mathbb{E}[\text{Payment}_{ilk}]}{(1+r_f)^{k-t}}. \tag{1}$$

Payments are made until the loan is forgiven or the balance reaches zero. The balance evolves as follows:

$$\text{Balance}_{ilt+1} = \text{Balance}_{ilt}(1+r_{il}) - \text{Payment}_{ilt}, \tag{2}$$

where $r_{il}$ is the loan interest rate. Loans are forgiven after 25 years in repayment if they were originated before 2014, and 20 years otherwise.

By default, borrowers reimburse their loan over the ten year following their separation from school through a fixed-payment schedule under the Standard Plan. This fixed payment is:

$$\text{Fixed Payment}_{il} = \frac{\text{Initial Balance}_{il} \times r_{il}}{1-(1+r_{il})^{-10}}, \tag{3}$$

where $\text{Initial Balance}_{il}$ is the total amount they borrowed. Borrowers can also enroll in IDR. In IDR, they pay a fraction $\theta_{il}$ of their discretionary earnings, which is defined as the share of their earnings above 1.5 times the federal poverty line, but no more than what they would have paid under the Standard Plan schedule. If the household has a single student loan, the payment under IDR is:

$$\text{IDR Payment}_{ilt} = \min\left[\theta_{il} \times \max\left(\text{Income}_{it} - 1.5 \times \text{Poverty Line}_{it}, 0\right), \text{Fixed Payment}_{il}\right] \tag{4}$$

If the household has several student loans, the payment is divided across loans. The IDR payment can be zero. Households can also defer repayment because of economic hardship for up to five years. We assume $\theta$ is equal to .1 for borrowers in IDR in cohorts that left school after 2009, which is consistent with the newer IDR plans, in which borrowers in recent cohorts tend to enroll. For earlier cohorts in IDR, we assume that $\theta$ is equal to .15, consistent with the Income-Based Repayment plan that is available to all borrowers.

To estimate the present value of each loan in the data, we forecast yearly payments and iterate over equations (1) and (2) until the balance reaches zero or the loan is forgiven. The initial balance is set to its observed 2019 value. Our forecast of future payments depends on whether a loan was in repayment in 2019.

**Loans in repayment** If we observe a payment in 2019, we assume that, in expectation, households will keep making the same payment in the future, adjusted for inflation and growth in real earnings. We make two exceptions. First, payments cannot exceed current balance and interests due for the year. Second, households will not pay more than under the fixed payment schedule, unless they did so in 2019. Hence, the expected future payment in year $s > t$ is:

- if $\text{Payment}_{ilt} < \text{Fixed Payment}_{il}$, then:

$$\begin{aligned}\mathbb{E}[\text{Payment}_{ils}] = \quad & \min\Big(\text{Payment}_{ilt} \times (1+g_P+g_E)^{s-t}, \text{Fixed Payment}_{il}, \\ & \text{Balance}_{ils} \times (1+r_{il})\Big)\end{aligned} \tag{5}$$

- otherwise:

$$\mathbb{E}[\text{Payment}_{ils}] = \min\Big(\text{Payment}_{ilt} \times (1+g_P+g_E)^{s-t}, \text{Balance}_{ils} \times (1+r_{il})\Big) \tag{6}$$

where $\text{Payment}_{ilt}$ is the payment observed in 2019, $g_P$ is the inflation rate and $g_E$ the real growth of earnings. For example, we would expect IDR payments to increase with a family's earnings, but only up to the default payment under the standard plan. Some households in IDR had no earnings above 1.5× the poverty line, and therefore made no payment in 2019 even though they were technically in repayment. We treat them the same way.

**Loans in deferment or forbearance** For households who made no payment in 2019 because they were in forbearance or were in deferment, we assume that payments will start six years after leaving school. This assumption is motivated by the fact that payments can be deferred for up to three years and forbearance is allowed for several years. At this point, we assume that these borrowers will enroll in IDR with $\theta = 0.1$ and that interest accrues in the meantime.[10] Hence, expected future payment is:

- if $s > \text{Graduation Year}_i + 5$, then:

$$\begin{aligned}\mathbb{E}[\text{Payment}_{ils}] = \quad & \min\Big(0.1 \times \max\Big(\text{Income}_{it}(1+g_E)^{s-t} - 1.5 \times \text{Poverty Line}_{it}, 0\Big) \\ & (1+g_P)^{s-t}, \text{Fixed Payment}_{il}, \text{Balance}_{ils} \times (1+r_{il})\Big)\end{aligned} \tag{7}$$

- otherwise:

$$\mathbb{E}[\text{Payment}_{ils}] = 0, \tag{8}$$

[10] Borrowers could also not be making payments because loans are in default. We assume that default leads to a similar pattern of cashflows. If borrowers default, 15% of their wages are garnished above a threshold. In practice, some borrowers wages are not garnished if they are self-employed, or it is difficult to contact their employer. We thus implicitly assume that recovery is imperfect and two-thirds of borrowers have their wages garnished.

Family incomes in the first year are set to their observed value in the SCF whereas the poverty line is calibrated based on family size and federal guidelines for 2019.

**Calibration** We set the inflation rate to $g_P = 2\%$, the nominal risk-free rate to $r_f = 3\%$. We assume that households' earnings grow at a rate of $g_E = 2\%$, which combines the nationwide growth in per capita earnings, and the growth of earnings over the life cycle, which we estimate to be close to 1% among student debt borrowers in the 2019 SCF.

# 3 Distributional Impacts of Loan Forgiveness Policies

We next turn to exploring the distributional impacts of loan forgiveness. Table 2 presents our main analysis of the present vale of loan forgiveness. Specifically, the table reports the total and per capital present value gains of the policies we valuate by earnings deciles, including households without any student debt, and ethnic groups. The first six columns consider the present value of forgiveness amounts per person, the second six columns consider aggregate amounts, and the final six columns show the share of dollars given to each group.

We consider three policies related to direct cancellation of debt, canceling all student loan balances, or only $50,000 or $10,000 per person. We additionally consider three policies that increase IDR enrollment. First, borrowers pay 10% of their discretionary income, in line with current IDR rules. Second, loans are also forgiven 10 years after the first repayment. Finally, discretionary income is limited to earnings above three times the poverty line. The top panel shows the values by earnings decile, while the bottom panel shows values by ethnicity. The last two rows of the table report the present value gains and change in balance for the entire population.

## 3.1 Loan Cancellation

Figure 2 shows student loan balances and present values by earnings decile and race. This figure effectively shows the benefits of universal loan discharge to borrowers in different groups, which can be viewed as the present values of the loans forgiven. Households with higher earnings have larger balances because they are more likely to be college graduates. However, the

relationship between earnings and the present value of student debt is even steeper because low earners are less likely to fully repay their balance before it is forgiven. For the top decile, the present value is very close to the balance, but it is below 40% for the lowest decile.[11]

Figure 2 demonstrates that most of the benefits of universal loan forgiveness would largely accrue to higher income individuals. The top panel shows balances and present values split by earnings decile. The figure shows that most of the benefits of universal loan forgiveness would accrue to high-income individuals. Both balances and present values are increasing for the first nine earnings deciles. The bottom earnings decile has a balance of $3,002, and a present value of $1,070, while the ninth earnings decile has a balance of $8,339 and a present value of $8,465. The highest earnings decile has a balance of $6,195 and a present value of $5,994, which is slightly lower than that of the ninth earnings decile and comparable to the seventh earnings decile. The average individual in the highest earnings decile would receive more than five times more forgiveness than the average individual in the bottom earnings decile. The solid red line shows the ratio of present value to balance, which is a measure of the disparity between considering the value of forgiveness based on balances and its true cost. The ratio is increasing in earnings deciles. This suggests that, while using only balances to analyze the distributional consequences of loan forgiveness would generate the same basic result–that higher-income households would see larger benefits, it would overestimate the true value of loan forgiveness, in particular for low-earners.

The bottom panel shows balances and present values split by race and ethnicity. In terms of balances, Blacks have the highest average loan balance, at $10,630. Whites have a lower average loan balance, at $6,157, and Hispanics and others have a much lower average loan balance of $3,996. Computing present values presents similar overall patterns, but shrinks the gap between Blacks and Whites, who respectively have present values of $7,407 and $4,962. The ratio of present value to balance is lower for Blacks than Whites. Thus universal loan forgiveness would lead to roughly equal average benefits for Whites and Blacks, and significantly lower average benefits for Hispanics and other groups.

[11] To the best of our knowledge, there is no public benchmark to which we can compare our present value computation. However, *The Wall Street Journal* recently reported that, based on internal estimates, the Department of Education expected to recover only 68% of the value of federal student debt.[12] By comparison, we estimate the present value of student debt to represent 76% of total balance.

Figure 3 presents similar analysis to Figure 2, but focusing on more targeted debt forgiveness policies which forgive debt below a cap. The figure shows the value of projected debt forgiveness under two policies, forgiving up to $10,000 of debt and forgiving up to $50,000 of debt. The top panels show average balances forgiven and present values of loan forgiveness under the policy forgiving $10,000 of debt. The bottom panels shows average balances forgiven and present values of loan forgiveness under the more generous policy forgiving $50,000 of debt. The left panels show splits by earnings decile, while the right panels show splits by race and ethnicity.

Under both limited forgiveness policies shown in Figure 3, the overall relationship between income and projected forgiveness is very similar to universal forgiveness. Under both policies, we see much greater levels of loan forgiveness for higher income households relative to lower income households. With a $10,000 cap, the ratio of average present value forgiveness between the top and the bottom deciles is 4. With a $50,000 cap, the ratio of average present value forgiveness between the top and the bottom decile rises to 7. While the general relationship between forgiveness and income is similar under each policy, the overall levels of forgiveness are much greater with a higher cap. For people in the bottom decile, they receive $445 in forgiveness with a $10,000 cap, and $1,801 in the top decile. With a $50,000 cap people in the bottom decile receive significantly more, or $700 in forgiveness as do people in the top decile, who receive $4,920.

Turning towards the effects by race, shown in the right panels of Figure 3, we see slightly lower average present value levels of forgiveness for Blacks relative to Whites with a $10,000 cap. With a $50,000 cap, present value forgiveness levels are roughly equal between Blacks and Whites. Under both policies, Hispanics and others see lower levels of loan forgiveness relative to Blacks and Whites. The level relationship between the two policies is similar to that regarding income.

## 3.2 Income Driven Repayment

We next turn to an alternative option for loan forgiveness, IDR. IDR plans tie borrowers' monthly payments to their income. There are a number of IDR plans, with slightly different

parameters.[13] Under current IDR plans, borrowers pay 10 or 15 percent of their discretionary income, above 150 percent of the poverty line. After 20 or 25 years, remaining balances are forgiven. IDR plans thus have a significant forgiveness component, but unlike more general forgiveness options, IDR targets forgiveness towards lower income borrowers. Indeed, some persistently low-income borrowers in IDR plans can end up paying nothing at all. Borrowers who earn below 150 percent of the poverty line for the duration of repayment will end up making no payments and receiving full loan cancellation.

We consider the distributional impact of three options expanding IDR. Policymakers effectively have two methods in terms of expanding IDR. One, more borrowers can be enrolled in IDR.[14] Two, IDR plans can be made more generous, by lowering time to forgiveness or raising the threshold below which borrowers pay nothing. We consider three specific policies. First, we consider placing all borrowers in an IDR plan, under which borrowers begin paying on income above 150% of the federal poverty line and pay 10% of this income. Second, we consider putting all borrowers in IDR and forgiving remaining balances after ten years. Finally, we consider placing all borrowers in IDR and raising the repayment threshold to 300% of the federal poverty line, as opposed to 150% under current plans.

Importantly, we assume that this policy is targeted towards borrowers for which it generates a present value gain. Because interest rates on student loans exceed the risk-free rate, rolling debt is an NPV negative decision unless a substantial part of the balance is rolled until it is forgiven. Some middle-class earners have lower payments in IDR than under the ten-year schedule, but these payments would still be sufficient to fully repay their loan, or most of it. For them, it is better to repay sooner rather than later and reducing their payments is not a good idea.

Figure 4 explores who benefits from the expansion of IDR, in terms of loan forgiveness. The figure shows a triple of columns for income and racial or ethnic groups, each one depicting

[13]The first modern IDR plan, Income Based Repayment (IBR), was introduced in 2009. Under this plan, borrowers pay 15% of this discretionary income and remaining balances were forgiven after 25 years. Under more recent plans such as the Pay as You Earn and new IBR plan, borrowers pay 10% of their incomes and remaining balances are forgiven after 20 years. Most borrowers in recent cohorts who choose IDR repayment options are in these newer, more generous plans, and thus our repayment model uses 10% repayment and 20 year forgiveness.

[14]This is common in may countries with higher education systems similar to the US. For example, in the UK and Australia all student loan borrowers are automatically enrolled into IDR plans that are administered by tax authorities. Chapman (1997) provides a discussion of IDR plans in other countries.

forgiveness under a different policy. In each triple of columns, the first column shows projected forgiveness from enrolling all borrowers in the current most generous IDR plan, PAYE. The second column shows projected forgiveness from enrolling all borrowers in a plan slightly more generous than PAYE, under which remaining balances are forgiven after ten rather than twenty years. The third column shows forgiveness under a plan identical to PAYE, but under which borrowers begin paying a portion of their income above 300% of the federal poverty line. The left panel shows projected forgiveness in earnings deciles, while the right panel shows projected forgiveness by race and ethnicity.

The leftmost column in each triple shows projected forgiveness under a loan repayment system similar to that in the UK or Australia, with all borrowers in IDR. Under this system, we see most projected forgiveness accrues to borrowers in the middle of the earnings distribution. Individuals in the lowest earnings decile receive more than four times ($518) as much forgiveness relative to borrowers in the top of the earnings distribution ($117). Borrowers in the next highest and lowest deciles respectively see more forgiveness, $527 and $259 respectively. Individuals in the third to seventh deciles each receive substantially more forgiveness than the top and bottom. Putting all borrowers in IDR thus leads to significant forgiveness for middle income borrowers, in contrast to universal or capped forgiveness policies which disproportionately benefit high income borrowers. Individuals in the third through seventh deciles receive 69% of the total forgiveness, and people in the bottom half of the earnings distribution receive more than half of the gains. In terms of the racial and ethnic effects of putting all borrowers in IDR, forgiveness amounts are twice as high for Blacks relative to Whites and the general population. Hispanics and others see lower loan forgiveness amounts relative to other groups.

We next turn to the middle column, which depicts a more generous IDR plan under which loan balances are forgiven after ten years, as opposed to twenty under current plans. Unsurprisingly, earlier loan forgiveness leads to substantially more forgiveness across all groups. This increase in forgiveness amounts comes at the expense of progressivity, with high earners seeing larger forgiveness amounts. With ten-year forgiveness, we see the highest earnings decile receiving $3,762 in loan forgiveness, 3.9 times the amount that the bottom earnings decile receives, $962. The bottom three income deciles receive slightly more forgiveness in this scenario as they would under a plan with forgiveness occurring after twenty years. This

is likely due to the fact that they are paying very little under either plan, and hence receive substantial forgiveness after ten or twenty years. Higher earnings deciles see significantly more forgiveness under this plan. The racial and ethnic patterns of forgiveness under an IDR plan with forgiveness after ten years are similar to those under a plan with twenty-year forgiveness. Relative to Whites, we see higher forgiveness amounts for Blacks and lower amounts for Hispanics and other groups.

The final column of each triplet shows project forgiveness under a different IDR plan with increased generosity. Rather than borrowers paying a fraction of their income above 150% of the federal poverty line, under this hypothetical plan borrowers pay a tenth of their income above 300% of the poverty line. This plan shows a similar pattern to the first option-enrolling all borrowers in IDR-albeit with higher forgiveness amounts for middle-income households. Individuals in the lowest and highest earnings deciles again receive $788 and $186 respectively, which are close to the amounts under the system enrolling all borrowers in IDR. We further see similar patterns along racial and ethnic lines, with Blacks receiving the most forgiveness and Hispanics and others receiving less relative to Whites.

It is useful to directly compare IDR to other forgiveness policies. Table 2 indicates that enrolling borrowers in an IDR plan where borrowers pay a tenth of their income above 300% of the poverty line would lead to $174.3 billion in present value forgiveness. This is slightly lower in aggregate than the $196.2 billion in forgiveness under a policy forgiving up to $10,000 of student debt per person, but the bottom 60% of the income distribution would actually receive higher forgiveness amounts under the more generous IDR plan. The difference in aggregates arises from the fact that the top 40% of the income distribution receives substantially more forgiveness under the capped plan than under the more generous IDR plan. We see a similar pattern when we compare the more generous IDR plan to a policy forgiving up to $50,000 of student debt per person, which would lead to $491.6 billion in present value forgiveness. However, under the more generous IDR plan the bottom 30% of the income distribution would receive more forgiveness than under the a plan forgiving up to $50,000 of student debt.

The results of this section suggest that enrolling more borrowers in IDR, and making IDR more generous leads to significant loan forgiveness that is somewhat targeted towards middle-income borrowers. Households in the bottom two earnings deciles receive roughly the same

amounts for forgiveness in a system expanding IDR as they would under a capped or universal forgiveness plan. However households in the top income deciles see significantly more forgiveness under capped or universal forgiveness plans relative to expansions of IDR.

# 4 Concluding Remarks

The ultimate distributional effects of student loan forgiveness depend on the present value of loans discharged to different individuals. This paper computes the present value of student loan forgiveness under different options. We find that universal and capped forgiveness policies are highly regressive, with the vast majority of benefits accruing to high-income individuals. On the other hand, enrolling more borrowers in IDR plans linking repayment to earnings leads to forgiveness for borrowers in the middle of the income-distribution. These results are important in studying the distributional consequences of loan forgiveness, and in designing policies aimed at student debt relief.

While the distributional effects of student loan forgiveness are an important aspect of student loan forgiveness, other factors may play a role in determining the desirability of debt forgiveness. Student loans may distort career choices (Rothstein and Rouse, 2011), credit constraints may hinder entrepreneurship (Barrios, Hochberg and Yi, 2020), debt overhang may distort labor supply decisions (Donaldson, Piacentino and Thakor, 2019) and debt relief may have macroeconomic consequences (Auclert et al., 2019). Future work should study tradeoffs between the distributional impacts of loan forgiveness and other potential benefits of borrower relief.

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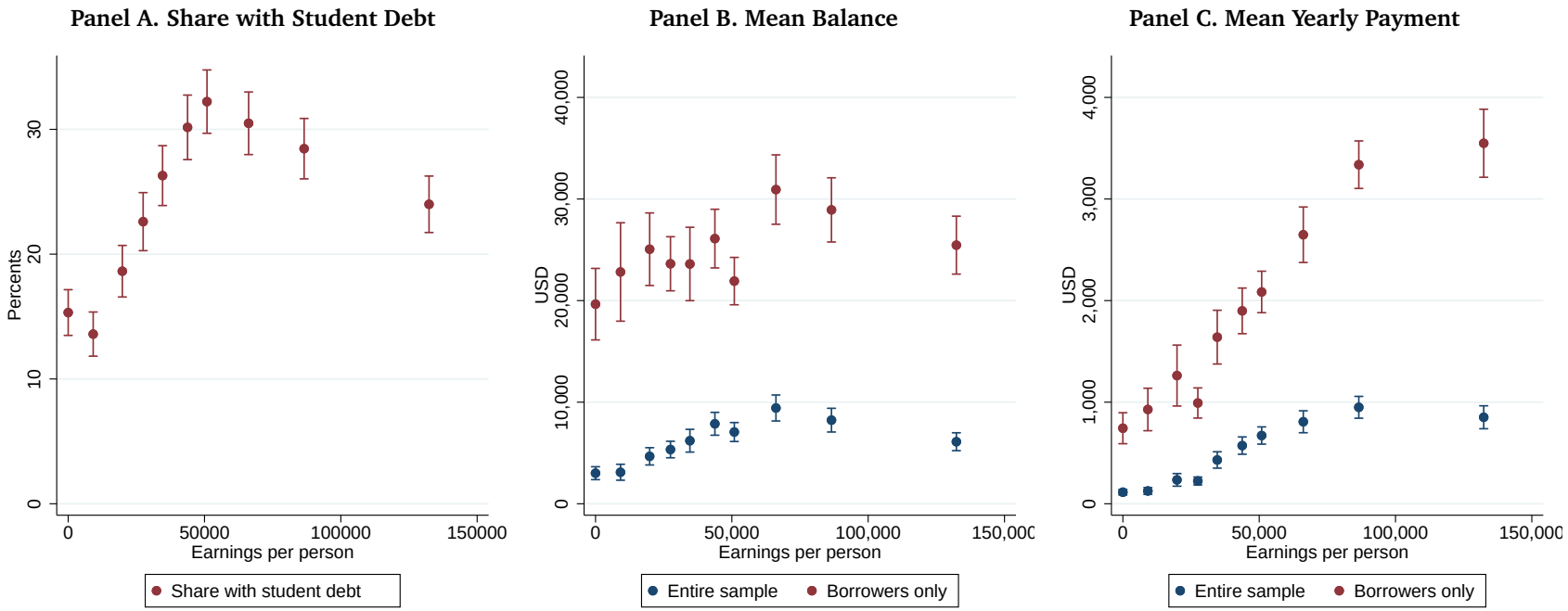
## Figure 1: Student Debt and Payments by Earnings Decile

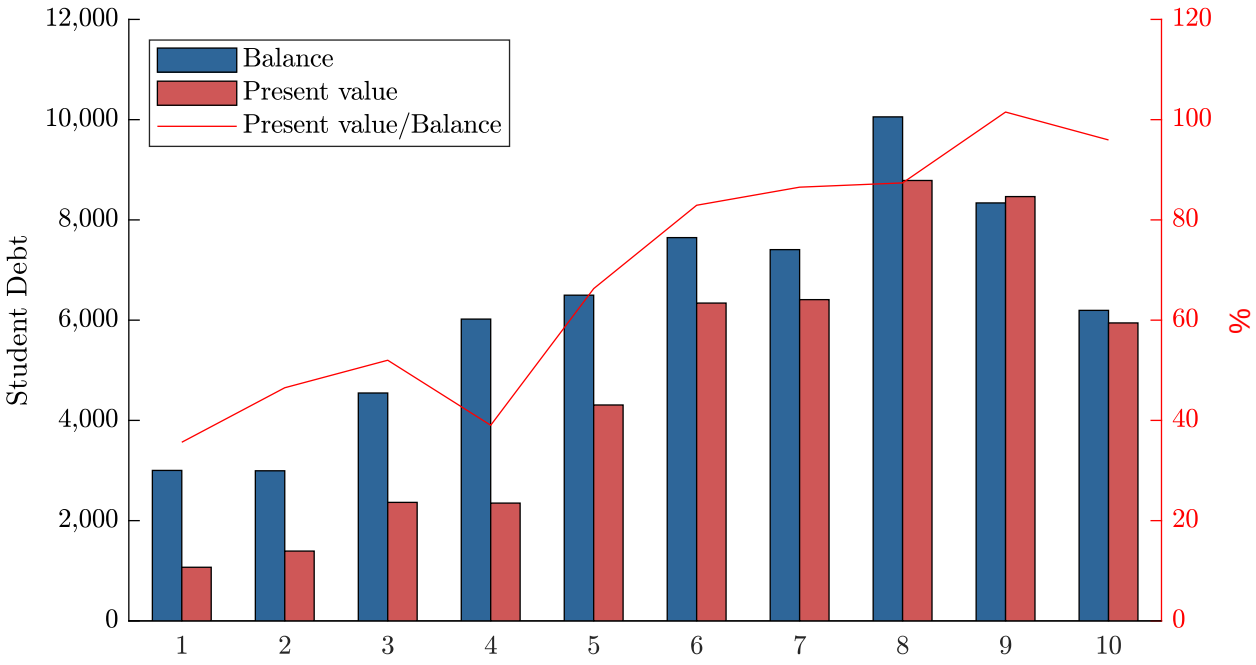
This figure displays the share of households between age 22 and 60 with student debt (Panel A) and the average per capita balance (Panel B) and yearly payment (Panel C), by within-cohort decile of earnings. We estimate debt levels and 95% confidence intervals by running OLS regressions on decile dummies using SCF sample weights. The x-axis reports the median earnings within each decile.



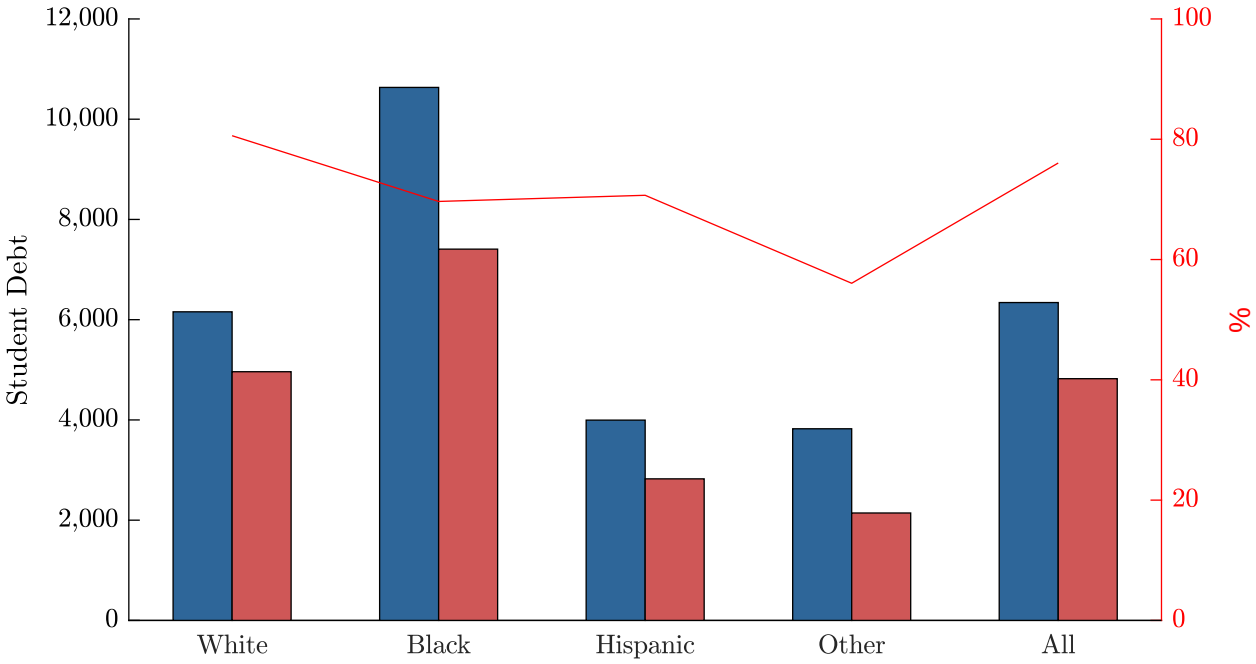
## Figure 2: Average Student Debt

This figure displays the average student debt per capita in 2019, by within-cohort decile of labor earnings and ethnic group, including households without student loans. Present values represent the sum of expected future payments discounted at the risk-free rate. The red line reports the ratio of the average present value to the average balance for each group.

**Panel A. By Decile of Earnings**



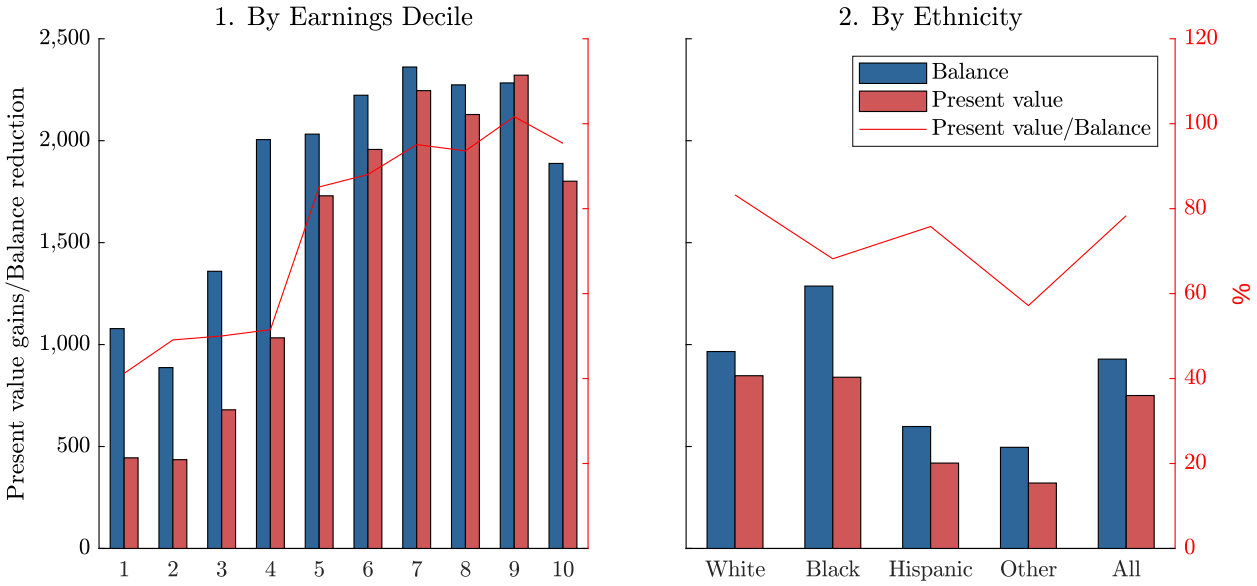

**Panel B. By Ethnicity**



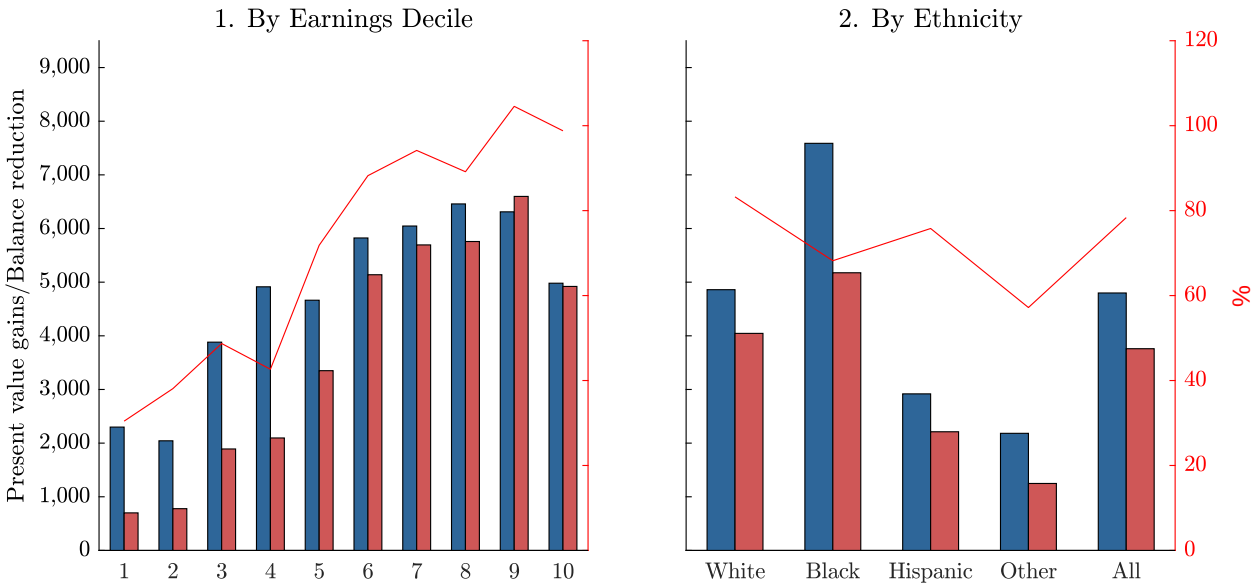
## Figure 3: Partial Balance Forgiveness

This figure displays the average change in student debt per capita after a partial balance forgiveness, by within-cohort earnings decile and ethnic group, including households without student loans. Panel A and B consider balance reductions of $10,000 and $50,000 respectively. The new present value of each loan is computed as before but assuming a lower counterfactual balance as of 2019. The red line reports the ratio of the average present value gain to the average balance reduction in each group.

**Panel A. Gains from forgiving $10,000**




**Panel B. Gains from forgiving $50,000**



## Figure 4: Targeted Enrollment in IDR

This figure displays the average present value gains from targeted policies of automatic enrollment in income-driven repayment, by within-cohort earnings decile and ethnic group, including households without student loans. First, we consider the case in which households would pay 10% of their discretionary earnings, in line with current IDR rules. We also consider *(i)* a variation of this policy in which loans are forgiven 10 years after the first repayment and *(ii)* a variation in which households pay 10% of their earnings only above three times the poverty line. In all cases, payments are capped by the default fixed payment. We assume that these policies are targeted towards households for which they generate present value gains.

## Table 1: Summary Statistics

This table provides summary statistics for the main variables used in the analysis. The left-hand panel is for our sample, that is, all households for which there are education loans and the school attendee has left their education program. The right-hand panel gives summary statistics for the full sample including individuals without any student debt. All statistics are weighed using SCF survey weights. The standard deviations are derived by regressing a variable $x$ on a constant, taking the square of the difference between $x$ and $\hat{x}$, and regressing the result again on a constant to get the variance.

| | **Households with Education Debt** | | | | | **Full Population** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Minimum* | *Median* | *Mean* | *SD* | *Max* | *Minimum* | *Median* | *Mean* | *SD* | *Max* |
| Have Education Debt | | | 100% | | | | | 21% | | |
| Balance | 120 | 21,700 | 41,400 | 17,500 | 419,000 | 0 | 0 | 8,700 | 21,000 | 419,000 |
| Initial Balance | 400 | 31,000 | 51,400 | 18,500 | 555,000 | 0 | 0 | 10,500 | 22,600 | 555,000 |
| Payment | 0 | 1,920 | 3,200 | 4,300 | 38,400 | 0 | 0 | 600 | 1,700 | 48,000 |
| Interest Rate | 0% | 5.5% | 5.9% | 3.3% | 29.0% | | | | | |
| Year Left School | 1973 | 2012 | 2011 | 6.2 | 2018 | | | | | |
| First Repayment Year | 1999 | 2014 | 2013 | 5.3 | 2019 | | | | | |
| Family Income | 0 | 71,300 | 97,300 | 135,600 | 2,433,300 | 0 | 59,100 | 106,300 | 459,300 | 703,590,700 |
| Number of Adults | 1 | 2 | 1.7 | 0.2 | 2 | 1 | 2 | 1.6 | 0.2 | 2 |
| Number of Children | 0 | 1 | 1.0 | 1.2 | 6 | 0 | 0 | 0.7 | 1.2 | 7 |

## Table 2: Present Value Gains from Forgiving Balances and Targeted IDR Enrollment

This table reports the total and per capital present value gains of the policies we evaluate, by within-cohort decile of earnings and ethnic group, including households without student debt. First, we consider canceling all student loan balances, or only $50,000 or $10,000 per person. Second, we consider enrolling households who would benefit from income-driven repayment. In IDR policy (a), they pay 10% of their discretionary income, in line with current IDR rules. In policy (b), loans are also forgiven 10 years after the first repayment. In policy (c), discretionary income is limited to earnings above three times the poverty line. The last two rows report the present value gains and change in balance for the entire population.

| | Per person ($) | | | | | | Total ($bn) | | | | | | Share (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Balance Forgiveness | | | IDR Enrollment | | | Balance Forgiveness | | | IDR Enrollment | | | Balance Forgiveness | | | IDR Enrollment | | |
| Earnings Decile | Full | 50K | 10K | (a) | (b) | (c) | Full | 50K | 10K | (a) | (b) | (c) | Full | 50K | 10K | (a) | (b) | (c) |
| 1 | 1,070 | 700 | 445 | 518 | 962 | 788 | 12.2 | 8.0 | 5.1 | 5.9 | 11.0 | 9.0 | 1.9 | 1.6 | 2.6 | 8.7 | 2.7 | 5.1 |
| 2 | 1,393 | 778 | 436 | 527 | 1,172 | 890 | 17.5 | 9.8 | 5.5 | 6.6 | 14.7 | 11.2 | 2.8 | 2.0 | 2.8 | 9.8 | 3.6 | 6.4 |
| 3 | 2,364 | 1,891 | 680 | 1,018 | 1,972 | 1,970 | 31.6 | 25.3 | 9.1 | 13.6 | 26.4 | 26.4 | 5.0 | 5.1 | 4.6 | 20.1 | 6.5 | 15.1 |
| 4 | 2,350 | 2,096 | 1,033 | 357 | 1,720 | 1,557 | 31.4 | 28.0 | 13.8 | 4.8 | 23.0 | 20.8 | 5.0 | 5.7 | 7.0 | 7.0 | 5.6 | 11.9 |
| 5 | 4,307 | 3,350 | 1,730 | 605 | 3,076 | 2,362 | 56.4 | 43.8 | 22.6 | 7.9 | 40.2 | 30.9 | 8.9 | 8.9 | 11.5 | 11.7 | 9.9 | 17.7 |
| 6 | 6,341 | 5,138 | 1,957 | 921 | 3,828 | 2,264 | 85.5 | 69.3 | 26.4 | 12.4 | 51.6 | 30.5 | 13.6 | 14.1 | 13.5 | 18.3 | 12.7 | 17.5 |
| 7 | 6,409 | 5,694 | 2,245 | 188 | 3,452 | 903 | 87.0 | 77.3 | 30.5 | 2.5 | 46.9 | 12.3 | 13.8 | 15.7 | 15.5 | 3.8 | 11.5 | 7.0 |
| 8 | 8,787 | 5,758 | 2,128 | 669 | 5,500 | 1,572 | 116.7 | 76.5 | 28.3 | 8.9 | 73.1 | 20.9 | 18.5 | 15.6 | 14.4 | 13.1 | 17.9 | 12.0 |
| 9 | 8,465 | 6,598 | 2,321 | 259 | 5,299 | 736 | 114.4 | 89.1 | 31.4 | 3.5 | 71.6 | 9.9 | 18.1 | 18.1 | 16.0 | 5.2 | 17.6 | 5.7 |
| 10 | 5,944 | 4,920 | 1,801 | 117 | 3,762 | 186 | 77.9 | 64.4 | 23.6 | 1.5 | 49.3 | 2.4 | 12.3 | 13.1 | 12.0 | 2.3 | 12.1 | 1.4 |
| Ethnicity | | | | | | | | | | | | | | | | | | |
| White | 4,962 | 4,045 | 1,694 | 460 | 3,211 | 1,207 | 420.2 | 342.6 | 143.5 | 38.9 | 271.9 | 102.2 | 66.6 | 69.7 | 73.2 | 57.5 | 66.7 | 58.7 |
| Black | 7,407 | 5,175 | 1,680 | 1,165 | 4,802 | 2,768 | 139.8 | 97.7 | 31.7 | 22.0 | 90.6 | 52.2 | 22.2 | 19.9 | 16.2 | 32.5 | 22.2 | 30.0 |
| Hispanic | 2,825 | 2,212 | 838 | 178 | 1,793 | 755 | 50.9 | 39.8 | 15.1 | 3.2 | 32.3 | 13.6 | 8.1 | 8.1 | 7.7 | 4.7 | 7.9 | 7.8 |
| Other | 2,143 | 1,248 | 642 | 393 | 1,403 | 680 | 19.6 | 11.4 | 5.9 | 3.6 | 12.9 | 6.2 | 3.1 | 2.3 | 3.0 | 5.3 | 3.2 | 3.6 |
| All – present value | 4,823 | 3,760 | 1,500 | 518 | 3,118 | 1,333 | 630.5 | 491.6 | 196.2 | 67.7 | 407.7 | 174.3 | | | | | | |
| All – balance | 6,342 | 4,798 | 1,857 | | | | 829.2 | 627.3 | 242.8 | | | | | | | | | |

## Table A.1: Variable Definitions

This table describes the main variables used in the analysis. All variables are taken from the Federal Reserve's 2019 Survey of Consumer Finances (SCF). The actual variable labels from SCF are included in the description. Any monetary variables are in terms of 2019 dollars.

| Name | Description |
|---|---|
| Balance | Current balance of each education loan. SCF main dataset: x7824 x7847 x7870 x7924 x7947 x7970 |
| Initial Balance | Original amount borrowed for each education loan, excluding finance charges. SCF main dataset: x7805 x7828 x7851 x7905 x7928 x7951 |
| Payment | Yearly payment on each education loan. Converted to annual payments based on the frequency of payments. SCF main dataset: x7815 x7838 x7861 x7915 x7038 x7961 |
| Interest Rate | The annual rate of interest charged on each education loan. SCF main dataset: x7822 x7845 x7868 x7922 x7945 x7968 |
| Year Left School | The last year that the borrower attends the program that they used each education loan for. SCF main dataset: x7880 x7885 x7890 x7895 x7900 x7995 |
| First Repayment Year | The year that a borrower begins making payments on each education loan. SCF main dataset: x7811 x7834 x7857 x7911 x7934 x7957 |
| Why Zero | Explains why the payments on an education loan are zero. Options include being in forbearance or a job or public service loan forgiveness program, not being able to afford payments, and still being enrolled or in the post-graduation grace period. SCF main dataset: x9300, x9301, x9302, x9303, x9304, x9305 |
| IDR | Indicates whether the payments on an education loan are affected by either being in an income-based repayment program or hardship deferral. SCF main dataset: x7422 x7424 x7426 x7428 x7430 x7432 |
| Family Income | Total income for each household. Taken directly from SCF Survey Extract data. |
| Number of Adults | Number of adults in each household. Value of either one or two depending on whether the reference person is married. Taken directly from SCF Survey Extract data. |
| Number of Children | Number of children in each household. Taken directly from SCF Survey Extract data. |