Student debt incidence: recent data and conceptual issues*

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Abstract

In recent years, rising levels of student debt along with stagnant wage growth have led to calls for assistance in the form of student debt cancellation. In this Commentary, we use the 2019 Survey of Consumer Finances (SCF) to estimate the incidence of student debt along the dimensions of household income, wealth and an estimate of lifetime wealth. We then use these estimates to document the corresponding distribution of cancellation benefits. We then illustrate some challenges in using such statistics to make conclusions about the progressivity or regressivity of cancellation schemes, and highlight open questions for future research.

1 Introduction

Education debt has risen sharply in the past decade and now stands at roughly $1.6 trillion, constituting the second-largest category of consumer debt behind mortgage debt.[1] This remarkable growth in debt has led to calls for increased government assistance, in the form of partial or full cancellation, and to a subsequent debate about the efficacy and distributional impact of such reforms.[2] In this Commentary, we estimate both the distribution of student debt and the distributional impacts of cancellation proposals using the 2019 wave of the Survey of Consumer Finances (SCF), the primary source of information concerning household balance sheets in the United States. We highlight how these estimates depend upon estimates of the value of future income, before discussing the extent to which such proposals may be considered progressive or regressive.

The debate over whether student debt cancellation is progressive reflects the understandable desire to determine whether or not it primarily benefits those who are finding

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[1]See the Federal Reserve Bank of New York's Quarterly Report on Household Debt and Credit for 2021 Q3 found here.

[2]See, for instance, Catherine and Yannelis (2020), and the articles published by the Roosevelt Institute and The Brookings Institution.

it the most difficult to pay their debts. However, since households differ along multiple dimensions, such as age, education, income and net worth, there is no single, observable quantity that represents this ability to service student debt. To illustrate this point more concretely, consider two hypothetical individuals: the first, a recent graduate from medical school with low net worth but expectations of high future earnings, and the second, a middle-aged college dropout with some accumulated wealth but poor prospects for future earnings. Which of these individuals is likely to have greater difficulty in paying down their debt now and in the future? The answer to this question depends crucially on the growth of income over the lifecycle, a quantity that be may be unknown to both the household and to us, the economists studying their responses. For this reason, we use the SCF to calculate the distribution of student debt under a variety of different assumptions on the value of future income.

Section 2 provides the main estimates in this Commentary, consisting of summary statistics from the SCF and our estimates of both lifetime wealth and the distribution of the benefits of student debt cancellation over various dimensions of household heterogeneity. Section 3 expands upon the above discussion to highlight two difficulties with proceeding directly from these estimates to claims regarding progressivity. First, one must specify the source of funding for cancellation proposals when assessing progressivity. To the extent that cancellation proposals negatively impact the government's budget constraint, they may necessitate an increase in future taxes, which may have separate distributional effects that ought not to be ignored. Second, focusing solely on average benefits by income or net worth quantiles ignores the fact that households with identical income and net worth may differ in their level of student debt. Section 4 then concludes with a discussion of possible future research.

2 Student debt in the SCF

The Federal Reserve Board's Survey of Consumer Finances is a triennial survey, designed to provide an overview of the balance sheets of a representative sample of U.S. households.[3] The survey contains many different notions of income and wealth. Households are queried about salaries, wages, interest income, transfer income, government assistance, self-employment income, and their various debts and assets. Since we are interested in estimating how the burden of student debt is distributed among borrowers, we will focus on the variables that best represent the ability of households to service this debt, both today and in the future. Section 2.1 looks at income and wealth, first comparing the income and net worth distributions of borrowers with those of the whole population, before estimating the distribution of student debt within each population. Section 2.2 then shows how we can use income and wealth and the cross-sectional distribution of income by age to arrive at an estimate for lifetime wealth. Section 2.3 then records the benefits

[3]For a more comprehensive introduction to the Survey of Consumer Finances and an analysis of the 2019 wave see Bhutta et al. (2020).

of student debt cancellation broken down by this last quantity.

2.1 Income, wealth and age

The simplest measures of the ability to service debt are current income and net worth (assets minus liabilities). Figure 1 provides us with a first look at how the population of borrowers differs from the general population, recording percentiles of per-capita income and net worth across the two groups of households.[4]

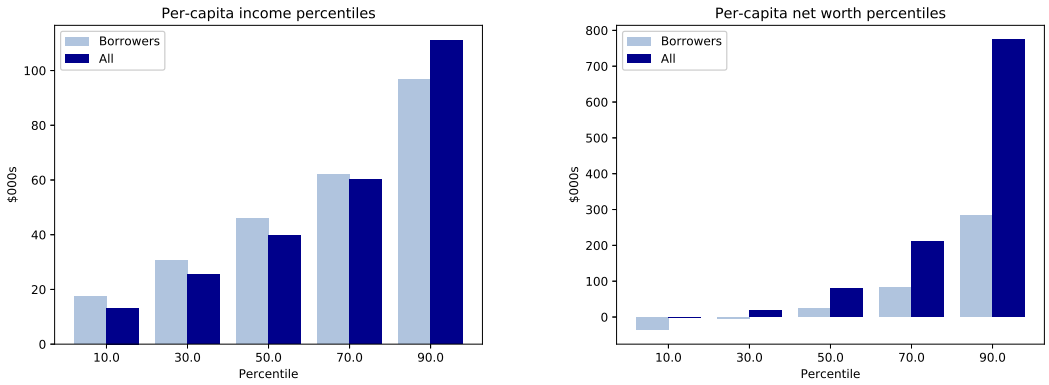

Figure 1: Percentiles of per-capita income and net worth

Households with student debt have a higher median income than the general population, while the mean and median net worth of borrowers is much lower than that of the general population. Further, the distribution of net worth is far more unequal than that of income for both populations. The difference between the two charts in Figure 1 illustrates the difficulty alluded to in the introduction in quantifying both ability-to-pay and the associated burden of student debt. If we were to focus solely on income, we would conclude that borrowers are typically richer than the general population, while the reverse would be true if we were to focus solely on net worth.

Figure 1 tells us nothing about how student debt is distributed among the population of borrowers. To examine this point, Figure 2 depicts average student debt per quintile of the income and net worth distributions, for both borrowers and the population as a whole.[5] For both populations, average student debt exhibits a hump-shaped pattern as a function of income, rising through most of the distribution before declining at the top. However, among the population of student debt borrowers, average debt does not vary greatly by quintile, with the average debt lying between $20,000 and $33,000 in every quintile. The average debt of borrowers in the highest income quintile is less than 50% higher than that in the lowest quintile. In contrast, the distribution of average student debt by net worth varies substantially by quintile, and for both the whole population

[4] Throughout this Commentary, we define per-capita quantities by dividing household quantites by two if the household head is married or lives with their partner.

[5] In Figure 2 the quintiles are defined using the entire population.

and the population of borrowers, a plurality of debt is held by households in the lowest quintile.

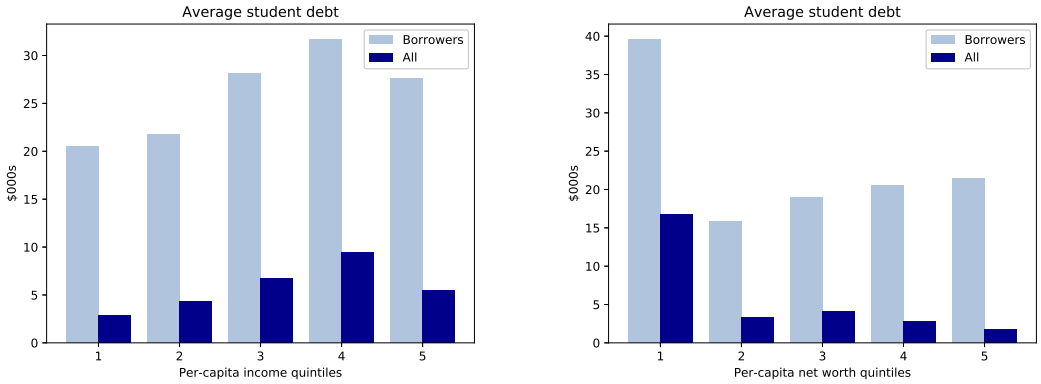

Figure 2: Average debt by income and net worth quintile.

Figures 1 and 2 show that focusing exclusively on either wealth or income materially changes our assessment of the incidence (or burden) of student debt. So which to choose? Both are relevant when assessing the ability of households to service their debts, but what we really desire is some measure for the lifetime wealth of the household, the sum of their current wealth and the *value* of their future income. However, in contrast with both income and wealth, the value that households attach to future income cannot simply be directly observed in the data, and so we must make further assumptions in order to produce our estimate.

To motivate our later exercises, we first explore how income and net worth differ systematically by age. Since students typically attend college when young, prior to having accumulated much savings, Figures 1 and 2 may simply reflect the dependence of net worth on the age of the household head. To investigate this point, Figure 3 plots the breakdown of ages across the populations with and without student debt, and shows that student borrowers typically belong to households headed by younger adults compared with the average household.

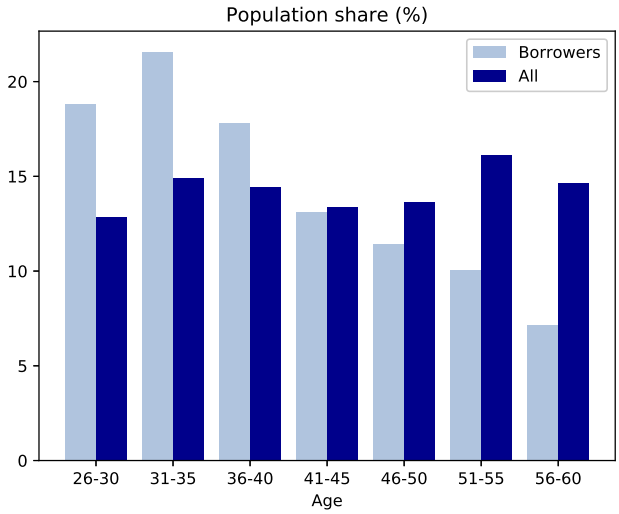

Figure 3: Population shares by age

Figure 4 depicts the mean and median of net worth and income by age group. Both mean and median net worth increase by more than an order of magnitude over the working life, while the corresponding mean and median for income increase by less than a factor of three, and exhibit a more hump-shaped pattern.

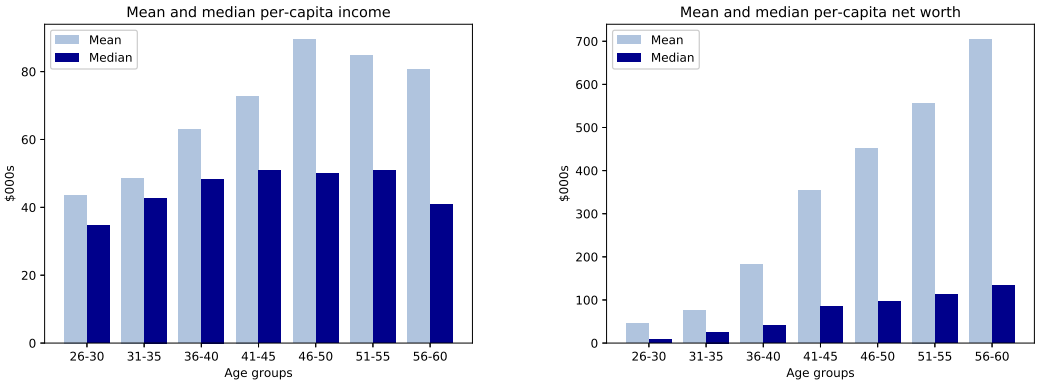

Figure 4: Lifecycle of net worth and income

Figure 4 shows that the relationship between income and wealth varies systematically by age, which suggests that we ought to focus on particular age groups when assessing the distribution of student debt. Returning to our previous point about the desirability of using a measure of lifetime wealth, these findings reinforce the conclusion that in order to estimate a notion of ability-to-pay, we ought to both account for age and combine the above information on income and wealth.

2.2 Estimation of lifetime wealth

There are many ways in which one could use survey data to approximate the lifetime wealth of households. For simplicity, we will suppose that the income growth experienced by households over the next few decades is consistent with the cross-sectional evidence in the 2019 Survey of Consumer Finances, in a sense that we now describe. We group households into eight different brackets based on the age of the household head. The brackets are of length five years, beginning with age 26 and ending at age 60. We begin at age 26 to ensure that the majority of borrowers have left school and entered the workforce, and end at age 60 in order to encompass the majority of one's working life. We then estimate future income by assuming that the growth of household income is consistent with the cross-sectional distribution of income across ages. Specifically, we compute median income in each bracket and assume that the difference in income in consecutive brackets represents the growth members of that bracket will experience in the next five years.[6] For a given interest rate, we then define lifetime wealth to be the sum of the discounted value of future income and the net worth of the household. This approach has its limitations, since the distribution of income across age groups may change in the future and borrowing costs vary across both time and households. However, it is a simple and transparent way to combine net worth and current income that incorporates the lifecycle aspect of income growth to produce an estimate of ability-to-pay.

For our main estimates we follow the Congressional Budget Office (CBO) in Appendix A of CBO (2020), who assume $r = 4\%$. Figure 5 plots average student debt broken down by lifetime wealth quintiles. In contrast with the corresponding breakdown by net worth in Figure 2, the average student debt by lifetime wealth is not concentrated in the lowest quintile, for either the whole population or the population of student borrowers.

[6] E.g., if the median income of households in the 31-35 bracket is 10% higher than those in the 26-30 bracket, then we assume that the income of a household headed by a 26 year old grows by 10% over the next five years. Further details are provided in Appendix B.

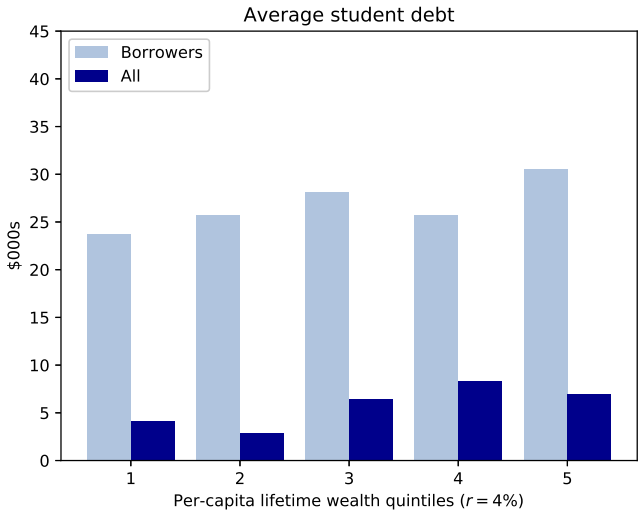

Figure 5: Student debt by lifetime wealth

Appendix C repeats this exercise for the higher discount rates of 7% and 10% and finds that the qualitative features of the plots are unchanged. Even for such high discount rates (or equivalently, low values attached to future income), it is not the case that average debt levels are highest in the lowest quintile.

2.3 Distribution of cancellation benefits

We want to estimate how cancellation benefits are distributed over the distributions income, net worth and lifetime wealth. To this end, we will consider proposals that cancel up to a fixed amount of student debt per borrower and document per-capita benefits across households. We first focus on income and wealth, before turning to our estimates of lifetime wealth. Figure 6 plots average per-capita cancellation benefits by quintiles of income and net worth when up to $10,000 is cancelled per borrower. Figure 7 produces an analogous figure when up to $50,000 is cancelled per borrower.

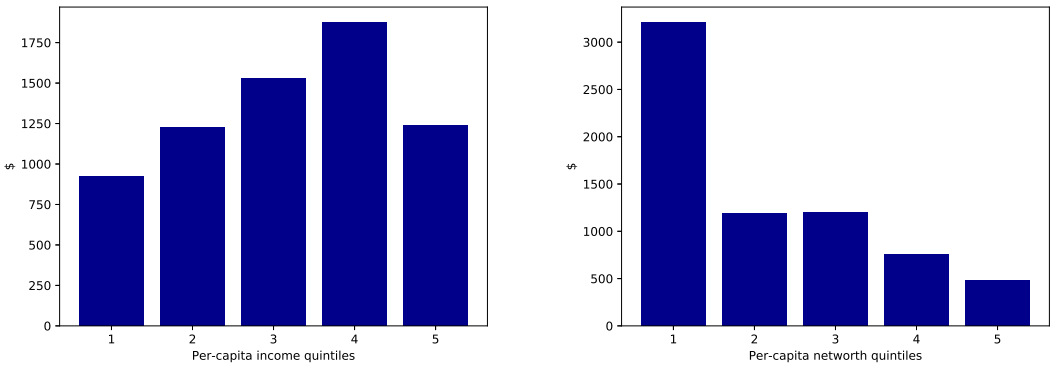

Figure 6: Per-capita cancellation benefits when up to $10,000 forgiven

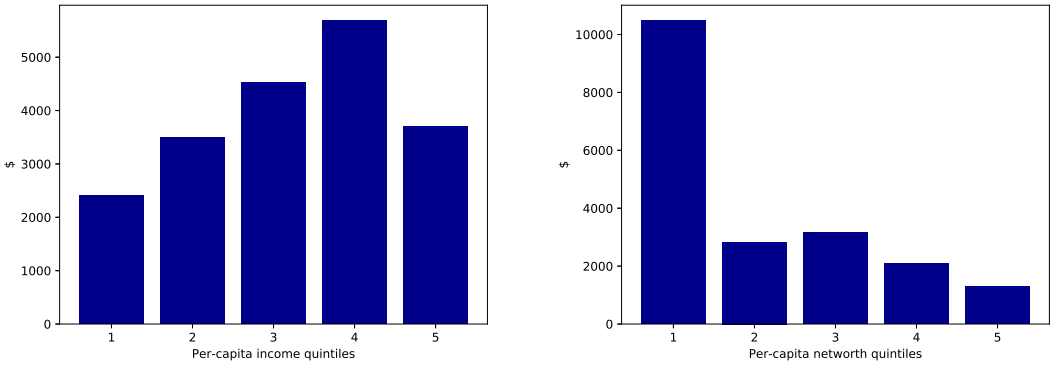

Figure 7: Per-capita cancellation benefits when up to $50,000 forgiven

Figure 6 and Figure 7 both exhibit similar qualitative features as Figure 2, which documents average student debt by income and net worth. For both $10,000 and $50,000, the benefits of cancellation are hump-shaped in the distribution of income, but concentrated among the lowest quintile in net worth. Figure 8 depicts the distribution of cancellation benefits by lifetime wealth, under the assumptions that up to $10,000 and $50,000 are cancelled per borrower, respectively.

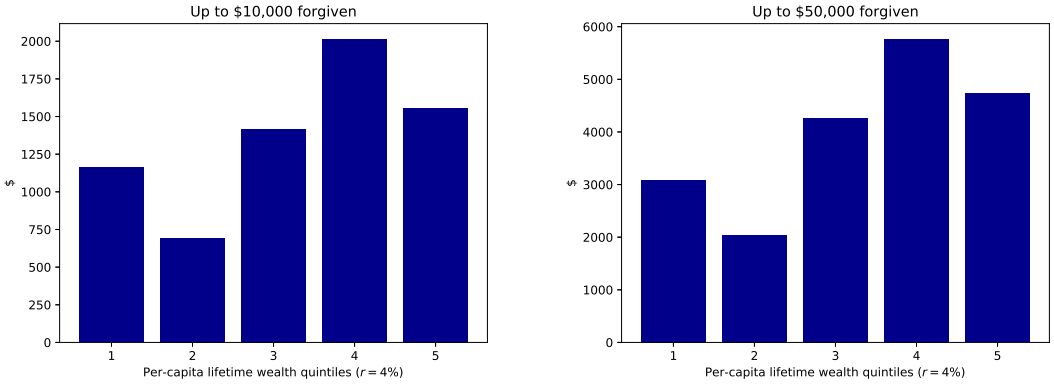

Figure 8: Average per-capita benefits by lifetime wealth

In contrast with the breakdowns by net worth in Figure 6 and Figure 7, for both cancellation levels the distribution of benefits are not concentrated in the lowest quintile. This pattern of average cancellation benefits across lifetime wealth quintiles is similar to that of average debt depicted in Figure 5.

3 Progressive or regressive?

There has recently been much debate in policy circles as to whether or not student cancellation is a "progressive" or "regressive" policy. This debate reflects the desire to understand whether or not the benefits of public policy primarily benefits those with the

fewest resources. In this section we outline two difficulties in proceeding directly from the above to assessments of the progressivity of cancellation.

Our first point is that the definition of a "progressive" transfer scheme is ambiguous when the source of funding is not specified. Economic progressivity is usually discussed in the context of a single taxation schedule, which is defined to be progressive if average tax rates rise with income, or, equivalently, if the ratio of taxes paid to pretax income increases with income. Implicit in this definition is that the taxation schedule incorporates all the transfers between the government and the individual (or household). However, in a tax system such as our own, in which individuals are subject to multiple forms of taxation and entitled to various separate transfers, things are not so simple and the appropriate analogue of this definition is unclear. In a discussion of the meaning of progressivity, Slemrod (1993) highlights the importance of understanding the interdependence of different tax and transfer schemes when assessing their distributional impacts,

> "The progressivity of the tax structure cannot be judged by looking at only one component of taxes. ... In recent years the fastest-growing component of federal taxes has been the payroll tax, which is regressive (the opposite of progressive) in its impact, because it taxes at a flat rate only on wages below $63,400 (in 1991). The Social Security system, however, is progressive because it pays higher benefits — relative to taxes paid in — to lower-income workers."

If a policy institutes a tax to fund a spending program, one cannot assess its progressivity or regressivity without reference to the incidence of both the tax and transfers together. As the above quote illustrates, the Social Security *system*, reflecting both the payroll tax and the benefits paid, is progressive, because the ratio of net benefits to pretax income is increasing with income. This point illustrates that one difficulty in characterizing student debt cancellation schemes as progressive or regressive is that such an analysis is incomplete until the implications for the government budget constraint are specified. If a policy changes the level of transfers, then to satisfy the government budget constraint either debt must increase, spending must fall, or tax revenue must rise, and each of these possibilities will have distinct distributional effects. For instance, even if aggregate benefits per quintile increase with income (or wealth or lifetime wealth), so too may the associated tax receipts, leading to an ambiguous effect on the net benefit by quintile.

Our second point concerns the importance of considering differences in student debt incidence among households with the same level of wealth and income. If student debt balances were solely a function of income or wealth, then the standard definition of progressivity could perhaps be applied by considering net (rather than gross) benefits. However, it is not true that households with identical lifetime wealth necessarily have the same debt, and so individuals with the same level of wealth and income will benefit differently from student debt cancellation. Such proposals therefore violate the principle of *horizontal equity*, the idea that individuals with equal ability-to-pay ought to be subject

to the same burden of taxation and receive the same net benefits from the government.[7] Although departures from horizontal equity are likely unavoidable in any transfer scheme, this problem is particularly acute in the case of student debt. Figure 9 documents the fraction of individuals within each quintile that lie within particular debt bins, and shows that for both income and lifetime wealth, there exists a great deal of heterogeneity within quintiles.

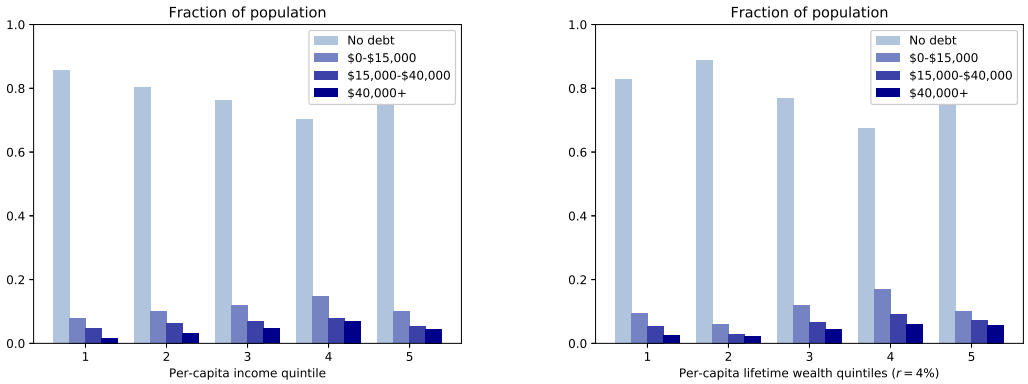

Figure 9: Breakdown of debt within quintiles.

In particular, within each quintile of either income or lifetime wealth, the majority of households hold no student debt at all. Focusing on the average benefits of cancellation in a given quantile is therefore potentially misleading because the majority of households in the quantile will receive no such benefits. The fact that student debt does not depend solely on income or net worth implies that the standard definition of progressivity is not applicable, even if the source of the funding were fully specified and lifetime income could somehow be measured without error. This also makes it difficult to proceed directly from the distributions depicted in Section 2 to claims about the distributional impact of debt forgiveness proposals.

4 Conclusion and areas for future work

In this Commentary, we have documented several facts regarding the distribution of student debt by income, net worth and lifetime wealth, and explained some challenges in applying the standard notion of progressivity. In particular, we have argued that knowledge of average benefits by quintiles of income or wealth is (by itself) not sufficient to label student debt cancellation progressive or regressive.

In our opinion, an analysis of the effects of student debt cancellation ought to incorporate the stylized facts presented in this Commentary but also possess the following features. First, the constraints faced by society when considering various proposals ought to be specified. In this context, these constraints are primarily those on public finances,

[7] See, e.g., Musgrave (1990) and the references therein for the history of this idea and further discussion.

since an increase in transfers must necessitate either a reduction in spending, an increase in debt, or an increase in taxes, each of which may have their own distributional implications. Second, the means by which we compare the merits of various proposals ought to be stated explicitly. When analyzing effects of various economic proposals, economists typically assume that the goal is to maximize a weighted average of the welfare of individual citizens. To the extent that an additional dollar is worth less to a rich household than to a poor household, such an objective will lead one to prefer to provide some form of social insurance via redistribution. By such a metric, the benefits of redistributing from rich to poor households must be weighed against the costs of treating individuals with the same lifetime wealth differently.

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A SCF

The Federal Reserve Board's Survey of Consumer Finances is a triennial survey of U.S. households, focusing primarily on household assets and liabilities. First undertaken in 1983, the sample size was roughly constant from the 1983 through 2007 waves at approximately 4,500 households. The most recent wave of the survey, conducted in 2019, has 5,777 households. The survey includes both a geographically-based representative sample of households and also attempts to over-sample wealthy households. All figures in this

Commentary are weighted according to the weights provided by the SCF, with quantiles computed linear interpolation where necessary. In our analysis we used two datasets: the summary dataset containing 351 summary variables constructed for the Bulletin article Bhutta et al. (2020), and the full public dataset, which contains 5,333 variables. The codebook for the full public dataset may be found here, and the definition of variables in the summary dataset in terms of the underlying variables may be found here.

B The estimation of lifetime wealth

In this appendix we elaborate on the calculation of lifetime wealth used in the main text. Suppose that we group households into eight different brackets based on the age of the household head. We will choose the brackets to be of length five years, beginning with age 26 and ending at age 60, and denoted $\{\mathcal{I}_n\}_{n=1}^{7} := \{[26,30],\ldots,[56,60],61+\}$, with the median income in $\mathcal{I}_n$ during 2019 denoted I_n. We denote by age_{it} and I_{it} the age and income of the ith household at date t, and the growth rate of income between t and $t+1$ by g_{it}. We then estimate future income by assuming that the growth of household income is the sum of a term common to all households and an age-dependent component chosen to be consistent with the cross-sectional distribution of income across ages,

$$g_{it} = g + \begin{cases} \ln(I_{n+1}/I_n)/5 & \text{if } \text{age}_{it} \in \mathcal{I}_n, n = 1,\ldots,7 \\ 0 & \text{if } \text{age}_{it} \in \mathcal{I}_8 \end{cases} \tag{B.1}$$

where g denotes the aggregate growth of income. Under these assumptions, given the income I_{it_0} of the ith household at date $t_0 = 2019$, we approximate income at future dates by $I_{it} = 1_{\text{age}_{it} \leq T_\text{d}} \prod_{j=t_0}^{t-1} e^{g_{ij}} I_{it_0}$, where we assume all households die at age $T_\text{d} = 80$. For an interest rate r representing the cost of borrowing, lifetime wealth LW is defined to be the sum of the present discounted value of future income and the net worth of the household, or $LW_{it} = \sum_{j=0}^{T_\text{d}} e^{-rj} I_{it+j} + NW_{it}$, where NW_{it} denotes net worth.

C Robustness to discount rate variation

In this section we explore the extent to which the results in the main text are sensitive to variation in the assumed discount rate. Recall that in the main text we followed Appendix A of CBO (2020) and assumed that $r = 4\%$. Figure 10 plots the incidence of student debt by lifetime wealth with $r = 7\%$ and $r = 10\%$, respectively, in contrast with the maintained assumption of $r = 4\%$ in the main text.

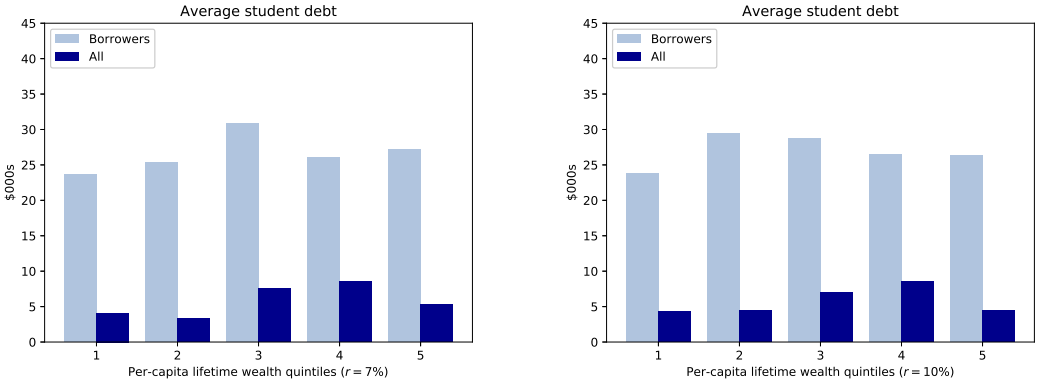

Figure 10: Student debt by lifetime wealth, $r = 7\%$ and $r = 10\%$

Figure 11 and Figure 12 plot the average cancellation benefits for the whole population broken down by lifetime wealth with $r = 7\%$ and $r = 10\%$, for \$10,000 and \$50,000 cancelled per borrower, respectively.

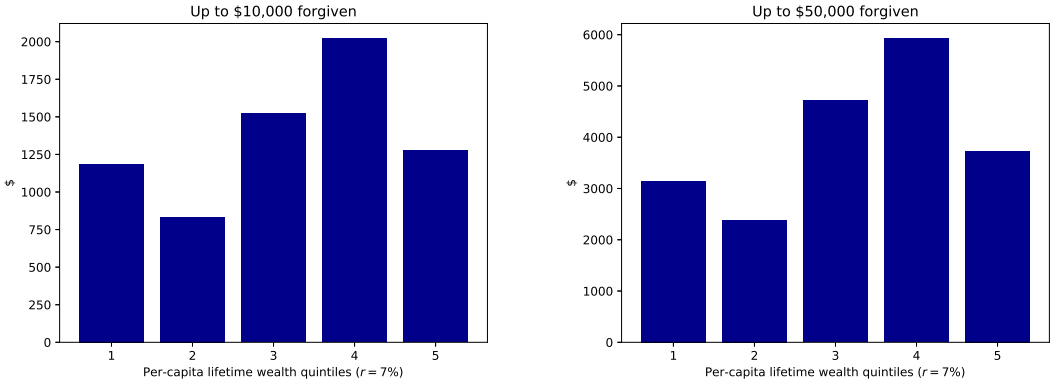

Figure 11: Distribution of benefits when $r = 7\%$

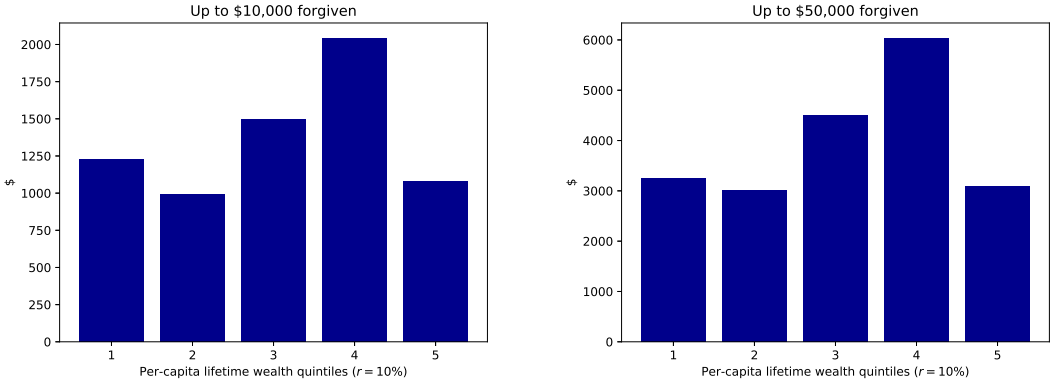

Figure 12: Distribution of benefits when $r = 10\%$

Even for the above high discount rates (substantially higher than that adopted by the

CBO and used in the main text), for both the population as a whole and each age group considered, average benefits do not vary substantially across quintiles. In particular, for none of the age groups and discount rates considered is it the case that benefits are concentrated among the lowest quintile.