Waivers for the Public Service Loan Forgiveness Program:

Who Could Benefit from Take-up?*

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ABSTRACT: For workers employed in the public and non-profit sectors, the Public Service Loan Forgiveness (PSLF) program offers the potential for full forgiveness of federal student loans for those with 10 years of full-time work experience. A year-long waiver issued by the Department of Education in 2021 to address administrative problems in program access provided a new path to PSLF relief for many borrowers. We explore the overall impact and distributional implications of potential full participation in loan forgiveness enabled by the PSLF waiver program using the 2018 Survey of Income and Program Participation (SIPP). Our estimates identify more than $100 billion in loan forgiveness available to as many as 3.45 million borrowers through the PSLF waiver program. Potential beneficiaries of this initiative are disproportionately employed in occupations like teaching and health care. Full take-up of the PSLF waiver would lead to a narrowing of the racial gap in student debt burden. However, the distributional impact of the PSLF waiver depends critically on the take-up rate and there is some evidence that those borrowers with relatively high income or advanced degrees have been most likely to access benefits.

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INTRODUCTION

More than 34 million workers comprising 23% of the labor force are employed in the public and non-profit sectors and 22% of these workers hold student debt. For these public sector workers, the Public Service Loan Forgiveness (PSLF) program in the College Cost Reduction Act of 2007 provides full forgiveness of federal student loans after ten years of full-time employment and qualifying payments. In principle, the PSLF program offers potential relief to a substantial number of borrowers with long-standing public service careers, including teachers, social workers, protection officers, firefighters, and many healthcare workers.

In practice, the benefits of the PSLF program have been illusory for many. In the first year of eligibility for forgiveness (2017), only 96 borrowers claimed benefits (338 by the end of 2018), and even by the end of 2022 only 342,898 had received benefits. Concurrently, there has been increasing national attention to student debt with just over $1.64 trillion held across more than 43.6 million borrowers (Federal Student Aid, 2023).

Part of the low take-up of PSLF has likely been a result of problems of design and implementation that have plagued the program from the outset, as certification of public service employment and the determination of qualifying loans and payments have proven particularly challenging for potentially qualified borrowers. While initial attempts to increase access to forgiveness opportunities began in 2018, the Department of Education introduced larger, more systematic changes in the form of a temporary waiver issued for the period from October 2021 through October 2022. Essentially, these changes allow high-tenure public service workers to gain forgiveness retroactively.

In this paper, we explore the overall impact and the distributional implications of potential full participation in loan forgiveness enabled by the PSLF waiver program.[1] We use information on individual student debt, income, ethnicity, and sector of employment from the 2018 Survey of Income and Program Participation (SIPP) to estimate the value and distribution of PSLF-eligible student debt. Our estimates identify more than $100 billion in immediate loan forgiveness available to over 3.45 million borrowers through the PSLF waiver program. Beneficiaries of this initiative are disproportionately employed in occupations like teaching and health care. Black Americans are also particularly likely to benefit, with full take-up of the PSLF waiver potentially going a substantial distance to closing the racial gap in student debt.

Yet, available evidence points to much more limited take-up of the PSLF waiver. Because take-up has been greatest among graduate borrowers and those with relatively high incomes, it is likely that the realized distribution of beneficiaries will be less progressive than the potential distribution among the eligible population.

While some of the provisions of the PSLF waiver program were ultimately extended into 2023, the expiration of the waiver on October 31, 2022, coincided with an intensive effort by the Department of Education to encourage sign-up for the limited loan forgiveness program announced in August of 2022.[2] For some borrowers eligible for PSLF, the promise of loan forgiveness of $10,000 (or $20,000 for Pell grant recipients) by executive action might have reduced incentives for navigating the PSLF application, particularly if this relief would have

[1] For those with less than 10 years of qualifying employment, the PSLF waiver does provide benefits to those who had extended periods of forbearance, who are enrolled in the wrong repayment plan or hold FFEL loans. We are limited in our capacity to measure these beneficiaries so focus on those potentially eligible for full and immediate forgiveness. And, for those with fewer years of experience, there is now a clear path to complete forgiveness of federal student loan debt after 10 years of post-degree employment.

[2] Well in advance of the August 2022 announcement, social scientists explored the distributional implications of different across-the-board forgiveness and repayment relief strategies (Catherine & Yannelis, 2023; Eaton et al., 2021; Looney, 2022). In its announcement of the proposed forgiveness plan, the White House claimed that about 90% of the benefits would accrue to families with incomes less than $75,000 (White House, 2022).

largely eliminated outstanding balances. Yet, relief from the proposed executive action forgiveness had not arrived by the end of 2022. The Supreme Court heard relevant cases on February 28, 2023, and their ruling on June 30, 2023 concluded that the Secretary of Education does not have the authority to cancel student debt under existing legislation. An open question is whether the proposed loan forgiveness by executive action made the PSLF waiver application process less salient for some borrowers, further reducing take-up rates during the period before the waiver expiration.

Policy-relevant questions about the distributional implications of the PSLF program extend beyond the window of the waiver, with other adjustments in federal student loan policy and administration affecting the beneficiaries of the program. To this end, student borrowers employed in public service have benefitted from the more than three-year pause on student loan payments, during which employment counted toward required months of service even as payments were not collected. One implication is that the amount of debt that can be forgiven under PSLF has increased by about the equivalent of three years of payments, with high-income workers who would have paid off loans in the absence of the pause the largest beneficiaries.

Our analysis proceeds by first using available data to estimate the potential impact of the PSLF waiver which expired in October of 2022 on the level and distribution of potential beneficiaries of forgiveness. We then explore the extent to which differential take-up likely impacted the distributional implications, ultimately shifting benefits to borrowers with relatively high income and levels of education. As we discuss in the final section, the forward-looking distributional implications of the broad-based PSLF program remain dependent on the extent to which eligible workers take-up benefits; potential for administrative innovations and outreach efforts may increase access to this program.

PUBLIC SERVICE LOAN FORGIVENESS

The use of student loan forgiveness as a policy tool to encourage entrance and persistence in occupations deemed to have high social benefits dates nearly 65 years to the National Defense Education Act (NDEA). As part of the Sputnik-era NDEA program, Congress provided loans at a subsidized interest rate for specific courses of study and offered partial forgiveness for those who pursued teaching as an occupation (Delisle & Holt, 2017). Teaching is an occupation particularly singled out in federal and state policies, with the contemporary federal Teacher Loan Forgiveness (1998) program and a number of state initiatives providing loan relief often targeted to those working in high-need fields or low-income schools.[3] Moreover, there is a concern that rising tuition coupled with a very large difference between private and public sector salaries in certain occupations such as the legal professions may be dissuading individuals from pursuing public service careers.[4]

The precedent of programs providing loan forgiveness for particular employment trajectories does not, however, correspond to well-defined economic theory justifying this policy tool. Indeed, one might ask whether direct subsidies (or tax credits) for particular occupational trajectories would be a more efficient way to provide incentives for occupational investments with high public returns. One potential argument for loan forgiveness programs is that students who have the highest reliance on loan finance in post-secondary education may be particularly

[3] Feng and Sass (2018) evaluate one such program specific to Florida and find that the relatively generous loan forgiveness substantially reduced attrition from hard-to-staff subjects.

[4] Field (2009) examines the impact of the comparison of a loan forgiveness program for lawyers who choose public service relative to a tuition assistance grant which would convert to a loan if the recipient did not pursue public service for students at a selective law school. Field's results demonstrate that tuition assistance recipients were appreciably more likely to pursue public interest employment relative to those who were part of the loan forgiveness treatment.

productive in public service occupations; for example, a teacher who has come from a low-income background may be a significant role model for students in a low-income school district.[5]

An alternative explanation for the rise of programs like PSLF and other occupation-specific policies is that they are politically tractable; they appeal to popular concern about the burden of student loans and a desire to reward public service.[6] A rationale for the program was that it would streamline a set of disconnected, occupation-specific loan relief programs (Project on Student Debt, 2006). That the PSLF program was passed in an election year (2007) is consistent with an interpretation that the messaging has bipartisan appeal – it is hard to campaign on a platform of disinterest in helping teachers or firefighters.[7]

What is unprecedented about the PSLF program is the scope of public service with the definition based solely on an employer's sector as either local, state, or federal government or 501(c)(3) non-profit status. Some occupations that might be thought of as public service such as teaching are concentrated nearly entirely among public and not-for-profit institutions. For other occupations such as law or medicine, individuals may choose to pursue career trajectories in the not-for-profit or public sector (such as legal aides or public defenders) or in the commercial sector, with the latter generally providing appreciatively more remunerative compensation. In principle, about 23% of jobs in the United States are covered and range from careers commonly associated with public service such as teaching, social work, and protective services to occupations like

[5] While there is some evidence supporting role-model effects in education for minority students (Gershenson et al., 2022), we know of no evidence demonstrating that loan forgiveness policies are a causal factor in increasing the representation of teachers from minority groups.
[6] Delisle (2016) cites statements from Republicans (John Kasich) and Democrats (Hillary Clinton) alike supporting public service debt relief.
[7] The Bush administration was originally opposed to the College Cost Reduction Act (and threatened a veto) on the grounds that it represented "…using the budget reconciliation process as a vehicle to create a host of expensive new Federal programs rather than to restrain Federal entitlement spending."

accounting or other administrative services for which there are positions with similar skill requirements in both public and private sectors.[8]

PSLF Policy Context

The budget implications of the PSLF program were likely poorly understood when it was passed and remain unclear today. One challenge for estimating the potential beneficiaries and the cost of the PSLF program is that its introduction coincided with the 2006 addition of the GradPLUS program, which effectively allows graduate students to borrow up to the full cost of attendance, including room and board along with tuition. In the subsequent years, graduate student borrowing increased markedly, rising from $27.3 billion in 2006-07 to the peak of $41.1 billion in 2010-11 before leveling off to the level of about $38.9 billion in 2020-21. While some of this increase in borrowing corresponds with the enrollment surge of the Great Recession, the amount borrowed per student also increased (Black et al., 2023; Delisle & Cohn, 2022).

In a report titled "Zero Marginal Cost", Delisle and Holt (2014) examine income and debt levels across professional fields like accounting, engineering, pharmacy, teaching, and social work. They find that, given typical incomes and the structure of the income-based repayment programs accompanying PSLF, borrowers in nearly all occupations could expect to have some debt forgiven at the end of 10 years. With an expectation of forgiveness, students faced a point at which additional debt would not lead to additional repayment burden and there would be no incremental cost to adding debt. The report indicates that these incentives were emphasized by institutions: a recorded session for Georgetown Law students aggressively marketed PSLF by

[8] This estimate comes from the 2017-2021 ACS 5-Year Subject Tables provided by the Census Bureau (Table ID S2408). Our estimates from the SIPP align with this proportion and the aggregate count of public service workers, about 35.4 million public service workers (23%) in the ACS and 34.5 million (23%) in the SIPP.

including testimonials from former students who attest that the program allows them to take low-paying jobs while "ignoring" debt balances.

The introduction of PSLF and new income-driven repayment programs may have also contributed to rising debt levels, particularly among borrowers considering employment in public service positions (Delisle & Holt, 2014). According to a report from the Department of Education in 2015, close to 30% of borrowers who had certified PSLF employment were carrying student loan debts surpassing $100,000 (Hoblitzell et al., 2015). This stands in sharp contrast to the overall percentage of borrowers with balances exceeding $100,000 by the end of 2017, which was just six percent (see Appendix Table B2).[9] That nearly 80% of those enrolled in PSLF at this point had balances surpassing the maximum for undergraduate borrowing ($31,000 for dependent undergraduates and $57,500 for independent undergraduate students), strongly indicates the dominance of graduate education as the source of debt among initially certified PSLF borrowers.[10] However, for some borrowers, current balances far exceeded the amounts initially borrowed as the capitalization of interest and periods of forbearance produced negative amortization.

Concern among policy analysts about unintended consequences and ballooning budget liabilities produced proposals for reforming PSLF, including a cap on forgiveness at $57,500 (Delisle, 2016). In 2014, the Obama administration proposed capping graduate debt forgiveness under PSLF (which the CBO estimated would save $6.7 billion over 10 years) to achieve budget reconciliation but the proposal did not gain legislative traction (Delisle, 2016). However, with a minuscule number of borrowers finding PSLF relief in 2017, policy discussion shifted away from

[9] All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's website and use the search engine to locate the article at http://onlinelibrary.wiley.com.

[10] While dependent undergraduate students are limited to $31,000 in federal Stafford loans across all years of attendance ($57,500 for independent students and dependent students whose parents are unable to obtain PLUS loans), graduate students face a much higher limit of $138,500. Beyond the Stafford program, graduate students are not limited in GradPLUS borrowing for educational expenses. See Federal Student Aid (2022).

potential budget liability to the identification of administrative problems that were inhibiting take-up.

PSLF Administrative Problems and Policy Waivers

Even as the description of the PSLF program is very straightforward – full forgiveness after 120 qualifying payments – the process and details are not. Borrowers need to have employment at a public or non-profit employer "certified", they need to be in the "right" type of repayment program, and they need to have the "right" type of federal student loans.[11] While complicated institutional details have been one deterrent to loan forgiveness under PSLF, poor administration of the program at both the Department of Education and the loan servicers contracted to administer the program has also contributed to take-up problems.

With the limited take-up of PSLF evident in 2017, Congress passed the Temporary Expanded Public Service Loan Forgiveness (TEPSLF) program, which widened the range of repayment plans eligible for forgiveness.[12] However well-intentioned, this effort did not resolve basic problems of administration, nor did it address the issue that many potentially eligible borrowers held the "wrong kind" of federal loans (guaranteed loans rather than Direct Loans).

A waiver issued by the Department of Education in October 2021 which extended to October 31, 2022, more dramatically changed eligibility. Nearly all student loan borrowers employed full-time in public service occupations who were not in default became <u>retroactively</u> eligible to have prior payments on *any* repayment plan and periods of forbearance count as

[11] The original authorizing language defined qualifying repayment programs as the standard payment plan of fixed payments over 10 years or an income-based repayment program. New income-based repayment programs introduced in 2012 and 2014 increased the generosity of PSLF by reducing the income percent of monthly payments above an income protection allowance to 10% from 15%; these programs were limited to borrowers who could show partial financial hardship.

[12] This legislation mandated that, as long as borrowers met all other requirements for PSLF, those using a Graduated Repayment Plan, an Extended Repayment Plan, a Consolidation Standard Repayment Plan, or a Consolidation Graduated Repayment Plan became eligible.

qualifying payments. Those who had accrued 10 years of full-time public service employment became eligible for immediate full forgiveness, while those with a shorter employment history were able to receive additional qualifying payments which would shorten the time to forgiveness. To gain eligibility, borrowers were required to complete the PSLF waiver application and, in some cases, the consolidation of older Federal Family Education Loan (FFEL) loans. (Appendix C presents additional program details; Appendix Figure C1 presents a timeline of policy action.)

Four primary issues were addressed by the PSLF waiver and subsequent administrative adjustments: the type of loans held by individuals, the type of repayment program, the treatment of forbearance, and the periods of employment counting for forgiveness.[13] The waiver process increased eligibility through the following channels:

1) **Expanding eligibility to prior payments on non-Direct Loans:** Payments (and public service employment) accruing on FFEL loans were not eligible for PSLF credit until a borrower consolidated to a Direct Loan.[14] Under the waiver, *borrowers could retroactively receive credit for prior periods of repayment on other loans paid before consolidation*, though borrowers still needed to consolidate to a Direct Loan before forgiveness under PSLF.
2) **Crediting Payments under Ineligible Payment Plans to Repayment Counts:** Original program rules required that borrowers repay their loans under an income-driven repayment plan or standard 10-year plan for their payments to count toward PSLF. Note that this rule change temporarily eliminated the means-testing of the program by tying forgiveness to enrollment in income-based repayment. For example, borrowers with high incomes and debts who enrolled in graduated/extended repayment plans would become retroactively eligible for PSLF even if they would have completely paid off their loan under an income-based plan.

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[13] Existing state laws in California and Texas prevent physicians practicing at nonprofit hospitals in these states from working for hospitals directly, initially limiting PSLF access for these specific groups. More recently, these workers gained eligibility with rule changes under the Biden Administration related to the PSLF waiver. In Appendix C, we provide additional details and resources around the specific rule change. Using state of residence information in the SIPP, there are an estimated 17,228 privately employed medical doctors with sufficient predicted years of qualifying experience with over $939 million in student debt in California and Texas, combined. Note, however, that the SIPP is unlikely to provide adequate coverage of occupations and related control of employer by state. We only observe medical doctor borrowers in 25 states, and even in the states where we do observe these borrowers, there are sometimes no observations in the private or public service sectors.

[14] Prior to 2010, many student loans were issued by private lenders with government guaranties under the FFEL. In 2010, the federal government ended guaranteed lending and shifted to full direct lending. In 2008, $122.5 billion of student loans were direct while $446.5 billion were FFEL; today $225.7 billion in FFEL loans remain outstanding, held by 9.9 million borrowers. Thus, in the cohorts borrowing between 2007 and 2010, approximately 80% of loans would have required consolidation to achieve eligibility for PSLF.

Under the waiver, *borrowers could receive retroactive credit on payment periods under the wrong repayment plan*.[15]

3) **Crediting Periods of Forbearance and Deferment Periods to Payment Counts**:[16] *Under an April 2022 administrative change, forbearance periods of 12 or more consecutive months, or 36 or more cumulative months will count towards PSLF (and IDR) payment counts.* A press release from Federal Student Aid (FSA) notes that borrowers qualifying for forgiveness under these one-time adjustments will begin to see loans forgiven in spring 2023, with the other remaining borrowers' accounts reflecting the adjustment in summer 2023.
4) **Providing Flexibility for Previously Non-Eligible Payments and Borrowers:** Borrowers could retroactively count periods of payment in which they were pursuing Teacher Loan Forgiveness and count late and partial payments.[17] Furthermore, borrowers who completed 120 payments with a qualifying employer but were not *employed* with a qualifying employer at the time of their application could receive forgiveness under PSLF.

While the waiver provisions eliminated statutory barriers, navigating the waiver application process remained a potentially burdensome hurdle. Just how many individuals stood to gain under these different waiver provisions? The Department of Education did not know.[18] The absence of data linking employment histories, loan balances, and repayment histories makes this impossible to know with certainty.

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[15] A report from the Consumer Financial Protection Bureau (CFPB, 2017) documented that loan servicers routinely failed to inform borrowers of repayment-plan requirements, despite indications that they were in public service or pursuing PSLF. And, because borrowers are required to re-enroll in income-based repayment plans (IBR) and "recertify" eligibility, there were often substantial delays which contributed to a lack of qualification for PSLF and higher payments in general.

[16] The Department of Education shared findings that loan servicers often placed borrowers in forbearance rather than into an income-driven repayment plan. From July 2009 to March 2020, more than 13 percent of Direct Loan borrowers used cumulative forbearance periods of at least 36 months. In effect, when servicers encouraged forbearance rather than income-driven repayment options, borrowers would often see gains in loan balances from interest accrual while failing to receive payment credit as would have occurred in IDR plans.

[17] Under the previous statutory language, periods of repayment in which teachers were also qualifying for Teacher Loan Forgiveness (which requires five years of payment for forgiveness of 5,000 dollars or 17,500 for specific subject areas) forfeited eligibility of those payments towards full forgiveness under PSLF. In 2021, 27,000 teachers received forgiveness through the TLF program.

[18] A 2013 report from the Consumer Financial Protection Bureau notes: "No data indicating level of indebtedness by sector is currently publicly available."

DATA AVAILABILITY AND DESCRIPTIVE STATISTICS

Data Availability

As the Department of Education lacks information on borrowers' employment histories, our aim is to approximate PSLF waiver eligibility using readily available data, characterize the group of student borrowers who potentially benefit, and estimate the aggregate debt and borrower counts of the potential eligibles. Recent student debt analyses have utilized the Survey of Income and Program Participation (SIPP) from the U.S. Census Bureau (Bennett et al., 2022), the Survey of Consumer Finances (SCF) from the Federal Reserve Board (Briones et al., 2023; Catherine & Yannelis, 2023; Eaton et al., 2021), and credit bureau data (Goss et al., 2023). The SIPP is the only dataset that we are aware of that measures both individual class of worker (government, for-profit, not-for-profit employee, or self-employed) and student debt balances, crucial for evaluating eligibility for the PSLF waiver. Further, relative to the SCF, the SIPP has a larger set of student borrower observations and allows for distributional analyses at both the individual and household borrower levels.[19] Additional limitations of the SCF such as inadequate coverage of the student borrower population particularly for low-income borrowers and household-level measurement of race and are discussed in other analyses (see Goss et al. (2023) and Looney (2022)).

The SIPP, however, lacks detailed loan information such as payment behavior and a long history of employment for most workers. Thus, we make several assumptions to approximate waiver eligibility (discussed in the section "Approximating PSLF Waiver Eligibility in the SIPP").

[19] Compared to the analogous sample from the 2019 SCF constructed by Catherine and Yannelis (2023), the SIPP has 22,338 more observations and 2,806 more borrowers. In Appendix B, we benchmark aggregate borrower counts and student debt balances against data from FSA and the counts reported by Catherine and Yannelis (2023). Like the SCF, the SIPP undercounts the total number of borrowers and debt. Wave 1 of the SIPP 2018 panel reports a total of 35.9 million borrowers and approximately $1.02 trillion debt whereas 2017 data from FSA report 42.6 million borrowers and approximately $1.4 trillion debt. A decomposition shows that the SIPP tends to undercount borrowers and debt along all age and balance size bins except for those with balances greater than $200,000 where the SIPP slightly overcounts.

For all borrowers, we observe the aggregate amount of student loans owed in the respondent's name only, and we assume these balances are federal following Bennett et al. (2022).

Despite some limitations, the SIPP is well-suited for a distributional analysis given the breadth of individual characteristics not found in credit bureau data and, key for PSLF, its unique combination of borrowing and class of worker information. Comparisons with administrative data and other survey resources in the section, "Consistency and Robustness Checks," promote confidence in estimates on the distribution of potential benefits from these data.

Sample Construction and Descriptive Statistics

Our baseline sample uses respondents between the ages 22 and 60 who were not enrolled in college in the first wave of the 2018 SIPP panel (participants are interviewed in 2018 about activities in 2017). We focus on the 2018 SIPP to limit any data complications resulting from the COVID-19 pandemic.[20] Our primary sample size is 28,115 individuals. Out of this sample, 3,564 individuals carry student loan debt. All estimates in our analysis are weighted using the SIPP December final person weights to produce counts that are nationally representative.

Table 1 shows summary statistics for the full sample, student loan borrowers, and the sample of individuals who are potentially immediate PSLF eligible. Borrowers differ from the full sample, which includes those who never borrowed and those who may have already paid off student loans, in that they are somewhat younger (median age of 35 versus 42) and they have higher levels of educational attainment, with 26.5 percent of borrowers holding graduate degrees relative to 12.7 percent of the full sample. Borrowers are also more likely to be employed in the government and non-profit sectors which lead to PSLF access (27.5% versus 17.1%).

[20] Data collection issues have resulted in the Census abandoning the 2019 panel and lower-than-average unit response rates for the 2020, 2021, and 2022 SIPP (the most recent available data at the time of writing). See Section 1.5 of the 2021 SIPP Users' Guide for more information.

"Insert Table 1 here"

Table 2 shows both the debt shares and balances (conditional on borrowing) for post-secondary attendees in the full sample and the immediate PSLF eligible group by race, education, income decile, and occupation. The distinctions by education, race and income are familiar (see, for example, the ACE study *Race and Ethnicity in Higher Education: A Status Report*) and need only be summarized. The incidence of student debt is increasing in post-secondary attainment, rising from about 15% of those with at least some college experience or an associate degree to 22.7% for BA degree recipients and more than 28% for those with graduate degrees. In turn, the levels of debt rise with education, as the median debt of those with graduate degrees is twice that of BA holders and the mean for graduate degree holders is about $36,000 greater than that for BA recipients. Student debt varies by race, with Black Americans more likely to hold student debt (28.6% relative to 19.8% for whites). While aggregate borrowing levels are similar by race, Black Americans are both less likely to hold BA degrees and graduate degrees than peers from other racial groups and hold more student debt within education categories. The SIPP data reinforce differences found in other studies such as Scott-Clayton and Li (2016) and Miller (2019) demonstrating Black-white gaps in debt, which often increase after post-secondary completion.

"Insert Table 2 here"

Central to our analysis is the comparison of the distribution of student borrowers and their debt across different employment sectors. Specifically, we differentiate between individuals employed in non-profit and public organizations (public service), which are covered by the PSLF program, from those in the for-profit sector and those not in the labor force. While there are various job opportunities across sectors for professionals such as lawyers, accountants, and secretaries, certain occupations like teaching and social work are predominantly found in the public service sector. Within the public service sectors, the occupational categories we estimate to have the largest aggregate debt for immediate PSLF forgiveness include teachers and other educational professionals, social workers, doctors, and protective service professions (police officers and firefighters).

As a baseline, those in the public sector are more likely to have student loans (25.8% in the public sector relative to 18.8% in other sectors) and hold mean higher balances ($40,000 vs $31,400 conditional on borrowing), which likely reflects the different educational requirements and selection. Workers in the public and non-profit sectors also tend to have individual income (measured as the annual sum of monthly earnings and income) in the middle of the overall distribution: they are underrepresented in the bottom three deciles and the top decile of the overall distribution observed in our sample. Considering the distribution of student debt by income (Figure 1), we see that public service workers are more likely to hold debt across the income distribution and have higher mean per capita debt balances in nearly all income deciles.

"Insert Figure 1 here"

AN ESTIMATE OF PSLF WAIVER ELIGIBILITY AND ITS POTENTIAL IMPACT

The PSLF waiver acknowledges systemic, historical failures of the program's administration and servicing, and potentially provides complete forgiveness for qualifying public service employees. And, for a larger group of public service employees, the waiver presents an opportunity for borrowers to accumulate additional qualifying payments on the way to forgiveness.[21] The goal of this section is to present a method to estimate PSLF eligibility, leveraging the suspension or leniency of typical eligibility rules under the waiver, and estimate the potential distributional

[21] Concurrent with the PSLF waiver period, borrowers were also eligible for a pause in payments (zero interest forbearance) during which time monthly credit continued to accrue toward PSLF forgiveness even as payments were not due.

implications and levels of immediately qualifying debt and borrowers. While we provide some analysis of the public service workers who are unlikely to be immediately eligible for the waiver, their debt balances and qualifying employment are subject to change, and thus, harder to pin down the eventual magnitude and distributional implications of forgiveness under the PSLF program.[22]

Approximating PSLF Waiver Eligibility in the SIPP

Individuals eligible for immediate PSLF relief are those with 10 years of full-time public service employment and associated payments (or forbearance) that qualify under the waiver. We classify individuals as "immediate PSLF eligible" if they have an expected record of at least 10 years of public service based on public service employment of 30 or more hours per week in January 2017. For those who reported continuous tenure at the same job, this is observed directly, while for others, the experience profile is estimated based on age less years of education less six.[23] (Appendix B provides a thorough description of the variables and sample restrictions used in our analysis).

Combining public service employment in 2017 and the standard Mincerian specification for potential experience will not perfectly predict true sector-specific tenure. This leads to two sources of error: individuals who are unemployed or worked in the private sector in 2017 may have worked long enough in public service to qualify, and those who do work in public service in

[22] Appendix Table A2 presents distributional estimates of public service borrowers and debt balances across predicted experience bins. Estimates from our immediate PSLF eligible group are generally reflective of all public service borrowers ages 22-60, not enrolled in school in 2017. Those with lower predicted experience (zero to four years) in public service are about 19 percentage points less likely to hold a graduate degree relative our immediate PSLF eligibles, yet graduate degree earners in this group still hold a disproportionate share of the debt (52.4%). These educational differences reflect the young ages for this lower experience group (by construction) and may be temporary as some workers invest in graduate education.

[23] The SIPP measures education by the individual's highest level of school or completed degree. Our primary specification assumes years of education are assigned as follows: 1) 12 for high school, 2) 14 for some college, certificate, or associate's, 3) 16 for Bachelor's, and 4) 18 for graduate degrees. We test for alternative specifications of education to account for differential years for graduate degrees based on field and type of degree and estimates are consistent with our main results (see column 3 of Table 3). See Appendix Table B1 for details on this specification.

2017 may not have accumulated enough experience in the sector. Our distributional estimates are robust when restricting our analysis to the borrowers for who we do observe long job tenures, which makes us confident in their accuracy.[24] However, using this group to assess bias in our aggregate estimates of relief is more difficult given its smaller sample size relative to the observed take-up behavior of the waiver.

Our remaining data challenges relate to student loan details that are not alleviated by the waiver rules: we do not observe whether loans are federal or private nor the number of qualifying payments. We follow Bennett et al. (2022) and assume all loan balances in the SIPP are federal, and, separately, that our measure of potential work experiences approximates monthly payments. Results presented in the section, "Consistency and Robustness Checks," suggest our eligibility approximation is reliable.

Returning to the descriptive statistics, the final panels of Tables 1 and 2 provide summary measures for our immediate PSLF-eligible group. We note that compared to the median student borrower, those who are potentially eligible for immediate PSLF relief have relatively higher median and average wages ($60,673 median and $69,622 average). Given that PSLF requires individuals to have worked at least 10 years in the public or not-for-profit sectors, these individuals are older, on average, than all borrowers and have higher measures of average job tenure (by construction).

Distributional Effects of Immediate PSLF Eligibility

Who are these potential beneficiaries of immediate PSLF relief? The information on employment characteristics and demographics in the SIPP is relatively rich, and the borrower

[24] Still, incorrectly assigning eligibility will bias the distributional results if demographic characteristics are systematically correlated with factors affecting work histories (e.g., parental leave may have gender distributional consequences).

sample size is quite large, allowing for the measurement of the distribution of potential waiver beneficiaries across multiple characteristics. We focus on four areas: race, education, individual income (including non-labor income), and occupation. While the former three characteristics are standard in student loan distributional analyses, occupation is of particular interest in the context of PSLF since the benefit is uniquely linked to the sector of employment. Some occupations are predominantly public service jobs, so full take-up of the waiver potentially has disproportionate impacts in particular areas of the labor market.

First, by occupation, the largest single occupational group is the teaching profession, representing over 24% of potential PSLF recipients (relative to about 3% of the population ages 22 to 60) while nurses and related health assisting occupations are about 10.5% of potential PSLF forgiveness recipients. Other occupations that are well-represented among potential immediate PSLF beneficiaries are those in the protective services such as firefighters and police officers (4.4%), social workers (5.7%) and physicians (1.6%) (see Figure 2a).

Debt levels vary by occupation, reflecting in part different educational requirements by occupation. Thus, the level of PSLF debt balances eligible for immediate forgiveness shifts towards occupations like physicians (bars titled "% Debt Immediate PSLF Eligible" in Figure 2a–d). While physicians and surgeons are only less than 2% of potential PSLF recipients, they appear eligible for about 6.5% of the predicted immediate forgiveness under PSLF. The estimated average forgiveness for eligible physicians is about $156,225 relative to about $49,209 for eligible teachers (Table 2).

Graduate degree attainment predominates among those with potential immediate PSLF eligibility, reflecting in part the concentration of occupations like teaching and social work in public service. While less than 13% of the full sample and about 26.5% of all borrowers hold a graduate degree, over 46% of the immediate PSLF population holds a graduate degree (Figure 2b). These graduate borrowers hold more than 64% of the debt likely eligible for immediate PSLF relief, illustrating the fact that individuals with a graduate degree have almost twice as much student debt relative to individuals with a BA.

Where those borrowers likely to benefit from PSLF forgiveness fit into the income distribution is one indication of the progressivity of the program. In Figure 2c, we show that potential PSLF relief is concentrated among workers in the 6th to 8th deciles of the income distribution. Over 55%, approximately $77 billion, of potential immediate PSLF relief would go to workers in these deciles. Naturally, those employed full-time in public service professions are underrepresented at the very bottom and very top of the income distribution, yet those in the top decile hold a disproportionate amount of the debt eligible for forgiveness.[25]

The distribution of potential PSLF relief by race reflects the relative concentration of Black Americans in the public sector and their greater reliance on educational borrowing to finance post-secondary education. While Black and White borrowers are similarly likely to be potentially eligible for PSLF forgiveness, Black borrowers can expect somewhat higher levels of forgiveness with mean relief expected to be $48,128 while those white borrowers eligible for forgiveness can expect to receive about $38,923 in forgiveness. As a result, Black borrowers would be expected to receive about 21% of immediate PSLF debt relief even as they are a somewhat smaller share of the eligible borrower count (17.2%) as shown in Figure 2d.

"Insert Figure 2(a-d) here"

[25] For comparative purposes with other distributional analyses, we also provide estimates of the waiver impact by household and equivalence-adjusted income in Appendix Figure A1. All three income measures produce qualitatively similar results. Benefits by household and equivalence-adjusted income are concentrated in the 5th to 8th deciles with approximately 52 and 57 percent of relief, respectively. Our PSLF eligible are represented in the bottom decile under these household income measures but are still a small proportion of all eligibles (about 1.4 and 1.5 percent). Benefits in the top of the income distribution are smaller relative to personal income, but those in the top decile still hold a disproportionate amount of the eligible debt when accounting for household income.

Impact of Immediate PSLF Eligibility on Student Debt Burdens

How much debt is eligible for immediate PSLF relief based on the identification of potentially eligible individuals in survey data? From the main sample, we provide an estimate of 3.45 million borrowers owing $137 billion dollars of student loan debt as potentially eligible for immediate PSLF relief. We emphasize that this is a best available estimate because there are several factors that determine eligibility for immediate PSLF relief that we are unable to incorporate.

The estimated aggregate effect of immediate PSLF relief under the assumption of full take-up is a reduction in the student debt burden by about 13.47% or about $3,816 per borrower.[26] The potential impact of the waiver is much more targeted than an across-the-board debt relief policy. Groups concentrated in the public sector with high debt balances would see the largest impact. Figure 3 (a) – (d) illustrates these projections by showing the expected PSLF relief in relation to the total debt outstanding for each subgroup.

By occupation, teachers would be expected to see particularly substantial debt relief from PSLF with balances falling from $51.8 billion to $20.7 billion. This drop of approximately 60% reflects the observation that nearly all teachers are employed by an eligible public sector employer. In the population at large, nearly 63% of teachers have 10 or more years of experience while about 58% hold a graduate degree, which is consistent with the high impact for this group (Digest of Education Statistics, 2021). Social workers and those in the protective services could also expect substantial reductions in debt from immediate PSLF relief, with debt levels falling by 38% and 69% respectively. Even as medical doctors typically have high debt relative to other public service

[26] These estimates are a within SIPP sample prediction. Aggregate student debt numbers in the SIPP are $1,017 billion across 35.9 million borrowers. As is widely acknowledged, the SIPP and other nationally representative surveys undercount student borrowers and debt. Thus, it is possible that somewhat different estimates would follow using the debt and borrowing numbers from FSA. Please refer to Appendix B for more information.

professions, the debt burden of physicians in aggregate would fall by about 25% given the relatively sizeable numbers of doctors in private practice.

As shown in panel 3b, full take-up of PSLF waivers would have the largest impact on the debt held by those with graduate degrees. Debt among graduate degree holders would decline by 26% with a decline of about 16% among all BA degree holders.

By income decile, those in the three deciles above the median (50th-80th) would see the largest reductions in overall debt burdens. Not surprisingly, those in the lowest income deciles would see little reduction in debt burden from the PSLF waivers. Yet, a challenge in assessing the progressivity of a program like PSLF is that beneficiaries have – by construction – more labor market experience than the population as a whole. An alternative would be to examine where the PSLF candidates fit relative to other workers with at least 10 years of experience. By this metric, the PSLF waiver would have its largest impact more squarely in the center of an income distribution of workers with similar levels of experience. An additional observation that adds context is that public service workers have much flatter age-income profiles, on average, than workers in the commercial sector; the result is that the position of the public service workers in a distribution based on lifetime income is likely somewhat lower than an early-career, point in time measure.[27]

As we have documented above, Black Americans are more likely than other racial groups to hold student debt and be employed in the public sector. Additionally, debt balances for Black Americans potentially eligible for PSLF are more than $9,000 greater than those observed for white Americans. The debt burden for Black Americans would decline appreciably from $114.9

[27] This conclusion follows from a regression with log annual earnings as the dependent variable and controls for education, sector of employment, experience and experience squared. Interactions between experience and employment in the public service sector are negative. Results available from the authors.

billion to $86.4 billion. Considered in the context of debt per capita, the Black-white gap in student loan debt observed in our full sample would be predicted to drop from $2,066 to about $1,470 if all eligible recipients took up benefits. Thus, while the PSLF program (and the associated waivers) are race-neutral in design, they have the potential to narrow racial gaps in student debt.

"Insert Figure 3 (a-d) here"

CONSISTENCY AND ROBUSTNESS CHECKS

Even as our method to estimate PSLF waiver eligibility and associated debt relief is indirect and necessarily based on assumptions that may include error, our results are robust to relaxing key estimation assumptions and consistent with independent survey data. [28]

One concern is that the use of a cross-sectional employment measure (from 2017) and the assumption of a uniform experience profile leads to the identification of public sector workers as eligible when they have insufficient full-time experience to qualify. A second concern is that some workers who are eligible based on their full profile of public service employment over more than a decade would be classified as ineligible because they were not employed or employed in the private sector in 2017. A different type of concern is that student loan debt captured in the SIPP undercounts aggregate measures from Federal Student Aid. We explore alternative assumptions and corroborating evidence using additional features of the SIPP and other data sources including the Panel Study of Income Dynamics (PSID) to address the concern that our SIPP-based estimates do not represent the level or distribution of borrowers.

Using Job-Specific Tenure in the SIPP and Observed Tenure in the PSID

While we do not observe full employment histories of workers in the SIPP, we are able to identify a subset of workers who have been in their positions for more than a decade based on responses to

[28] At some point in the future, a data link between the Department of Education's NSLDS files and either tax data from the IRS or survey data from the Census Bureau would allow for refinement of these estimates.

a question that asks respondents if that job started before January 2017, and if so, what year they began working in that job. Thus, for the approximately one-third of our immediate PSLF eligible group that have held their job since at least 2007, we can be more confident in their eligibility status and assess the distributional characteristics of this group relative to the full sample. Table 3 checks our main distributional estimates (column 2) against alternative immediate PSLF eligible sample definitions with columns (4) and (5) using these long job-specific tenured public service workers. Distributional estimates, overall, are consistent across sample definitions and the qualitative takeaways are identical: potential beneficiaries and dollar balances are concentrated with graduate degree earners and those in the sixth to eighth personal income deciles, with Black Americans holding a slightly disproportionate share of the eligible debt. Impacts by occupation are strikingly consistent despite the relatively small sample size of the group with high job tenure.

"Insert Table 3 here"

The long panel of the PSID allows for a (partial) assessment of within-public service mobility in employment as this resource allows for the identification of government employment (though not non-profit employment) in each year in which an individual holds a job. Using the PSID, we create a sample of household reference persons and household spouses with student debt who are employed by the government in 2017 and with a government employer in every biennial wave of the PSID from 2007-2017. A first point is that 45% of those borrowers employed by a government in 2017 were employed in each year of the decade. (This measure will still be an undercount of PSLF eligible as some workers will move between the non-profit and public sectors.) Our estimates from the SIPP are well-aligned with this proportion: we identify approximately 47% of government borrowers as being immediately eligible for PSLF. Also, in Appendix Table A3 we show that the demographic characteristics of this sample are qualitatively similar to both our sample of immediate PSLF-eligible individuals in the SIPP and a subsample of government-employed immediate PSLF-eligible individuals in the SIPP.

Impact of Missing Loan Information in Survey Data

Aggregate estimates of student borrowers and loans from survey data tend to undercount actual federal borrowers and balances as reported by FSA. Catherine and Yannelis (2023) note this in their analysis using the 2019 SCF, and our estimates show that the SIPP undercounts borrowers and debt by approximately 16 and 26 percent, respectively. While this implies that the magnitude of our counts of borrowers and debt are attenuated, a further concern is that these missing borrowers are not missing at random, thereby distorting distributional estimates. Moreover, as the SIPP lacks loan details, particularly whether student loans are federal or private, the task of benchmarking borrowers and balances against administrative data is complicated. Here, we briefly discuss how these main known issues with survey data are likely to impact our estimates.

In Appendix Table B2, we benchmark aggregate student loan borrower counts and balances in the SIPP with administrative data on the FSA portfolio from Q4 2017, with this point aligning with the SIPP reference period. The disaggregated counts by age and debt size provided by FSA allow us to understand where data may tend to be missing, and we detail this analysis in panels B and C. Because the SIPP undercounts debt and borrowers similarly across all age bins and most debt sizes, it is unlikely that the undercounting impacts the share of borrowers predicted to be eligible for immediate forgiveness.

Overall, our preferred estimates of the potential aggregate eligibility for immediate PSLF relief based on the SIPP represented in columns (1)-(3) of Table 3 place the total forgiveness in the range from 3.3-3.7 million borrowers affected with $127-144 billion in balances. Undercounting in the SIPP, combined with the observation that the pool of potential eligibles includes a longer panel of eligibles with those entering repayment as late as 2012 eligible for forgiveness by the end of the waiver in October of 2022, would suggest these estimates may be attenuated. Working in the other direction is the issue of overcounting the number of public service employees who are employment eligible, along with the potential that some of the observed loan balances are not eligible for forgiveness as they may be privately held or in default (see the section "Discussion of the Private Loan Market" in Appendix B) for a discussion of the private student loan market). An entirely different benchmarking exercise uses federal data on the vintage of loans to present back-of-the-envelope calculations. A total of $670 billion in repayment for 10 years or more x (0.25 currently employed in public sector) x (0.75 fraction of those in active repayment with public sector tenure of at least 10 years), would imply an estimate of $125.6 billion (2.8 million borrowers) as of December 2020, with eligible balances increasing in recent years.

With 670,264 individuals having received PSLF loan discharges for over $46.7 billion by June of 2023, all estimates make evident that take-up of the waiver has remained below the pool of likely eligible borrowers by a factor of between 5 and 6. In the next section, we explore available evidence on program take-up.

PSLF TAKE-UP

Empirical analysis demonstrates that the PSLF program "on the books" has the potential to dramatically reduce the loan burden for public service employees with significant labor market experience, while also providing an expedited path to forgiveness for many others. Still, the realized distributional impact of the PSLF program and the associated waiver depends on take-up behavior. The evidence of PSLF forgiveness suggests that many potential recipients of PSLF forgiveness have not yet succeeded in accessing benefits. Only 342,898 borrowers in the lifetime of the program received forgiveness through the end of 2022, with this number climbing to 670,264 by the end of June 2023 as FSA continued to process waiver applications and adjust payment counts. To date, the average forgiveness amount is $69,776 (June 2023). This is well above the average debt level held by all borrowers and substantially above the average expected PSLF forgiveness level based on the SIPP tabulations. The inference that those who have been among the first to succeed in take-up with the PSLF program have been among those with substantial graduate school debt, particularly for programs like law and medicine, is supported by evidence. Testimony from Richard Cordray (*Examining the policies and priorities of the Office of Federal Student Aid*, 2021), head of the Federal Student Aid Office, revealed that 83% of those who received PSLF relief by October 2021 had graduate-level debt while more than 30% had current income above $100,000.[29]

This potential selection into take-up among relatively high-income borrowers is consistent with recent social science evidence which suggests that "bandwidth-tax" of administrative processes is most onerous for those from the least advantaged groups (Finkelstein & Notowidigdo, 2019; Herd & Moynihan, 2018; Matthews et al., 2022; Mueller & Yannelis, 2021; Mullainathan & Shafir, 2013). Differential learning costs and compliance costs may have a sizeable impact on the level and distribution of PSLF take-up. One might hypothesize that doctors and lawyers (who tend to have the highest debt levels) may be among the most likely to have access to professional services to reduce the burden of navigating the application process.[30]

[29] Note that this result stands in contrast to the Canadian experience where nonmonetary costs of take-up tend to reduce participation in the Canadian Repayment Assistance among those who have access to greatest resources (Lochner et al., 2021). Two factors likely account for this difference: first, the returns to take-up are orders of magnitude greater (often 6-figures) than in Canada, dramatically changing the returns to navigating the application and, secondly, the application hurdles in the Canadian program emphasize time costs rather than complexity.

[30] Herd and Moynihan (2018) define "learning costs" as effort expended to gain awareness of program provisions, eligibility status and the application process while "compliance costs" reflect the burden of providing information and documentation and responding to administrative requests.

Eligibility for PSLF and utilization of the waiver is not automatic. Potentially eligible individuals must submit a certification and application form annually or when changing employers. If this is not done at the time applicants apply for forgiveness, they will need to provide certification for each qualifying employer they worked for while making the 120 payments (Federal Student Aid, n.d.). The good intentions of providing retroactive access to loan forgiveness under PSLF through the waiver process have not overcome the administrative hurdles of government bureaucracy in the process of waiver completion. The waiver application is a PDF form which requires "wet" signatures from both the borrower and the employer for employment certification while those with FFEL loans must also successfully consolidate loans. And, in a throwback to the prior century, most borrowers must submit their applications by fax or paper mail.

These hurdles likely matter for take-up. In their analysis of a related federal program, Teacher Loan Forgiveness (TLF), Jacob et al. (2023) conclude that program complexity and administrative barriers (many analogous to PSLF) constrain take-up of the program despite sizable loan balances.

To frame the impact of different types of selection into PSLF waiver completion on the distribution of immediate benefits, we consider three alternative scenarios. The first two – i) selection that favors those with graduate education, and ii) selection that favors high-income borrowers – reflect the observed early-phase selection into PSLF presented in tabulations from the Department of Education in October 2021. The third case – iii) selection that favors unionized occupations – considers the hypothetical disproportionate take-up by groups with strong employee organizations and unions which are positioned to facilitate learning about program benefits. We use prior period (2021) take-up given subgroup and the probability of subgroup eligibility in our sample to derive the expected number of PSLF participants and the expected level of debt relieved using 10,000 draws of proportional sampling. These alternative projections are shown in Table 4, with the first two columns repeating the earlier results (Figure 2a–d) which show the baseline distribution of immediate PSLF relief without selection into take-up.

"Insert Table 4 here"

Starting with selection into take-up that favors those with graduate education, the second set of columns illustrates that such a shift would direct about 91% of the PSLF relief dollars to those with advanced degrees (relative to 64% in the baseline). While the racial distribution of beneficiaries does not change appreciably, what does shift is the income distribution with a rise in the share of borrowers and relief dollars going to those in the top deciles. Adding selection by education to the selection by income magnifies this result, with about 21.7% of recipients and 35% of relief dollars shifted to the top decile. In this simulation, we also see a shift away from occupations like teachers toward other groups such as lawyers (not shown on the table). Again, the overall racial distribution of relief does not shift markedly.

A very different approach would emphasize the role of employee organizations in promoting take-up. Indeed, employee organizations like the American Federation of Teachers have been among the leading advocates for improving administrative procedures in the implementation of the program while also proactively promoting the program with members.[31] Mechanically, improving take-up among unionized workers leads to a strong shift toward teachers in the receipt of borrower relief, rising to 32.9% of borrowers and 32.7% of debt relief. In this scenario, the income and education distributions of PSLF closely parallel the distributions of PSLF

[31] See, for example, the settlement in Weingarten v. DeVos in October of 2021 and the pro-active efforts of the AFT to promote the PSLF waiver.

under full take-up. Overall, this rudimentary exercise underscores the importance of selection into take-up for understanding the distributional implications of the PSLF waiver.

LESSONS LEARNED FOR THE FUTURE OF PSLF AND STUDENT LOAN REPAYMENT

With about 40 million adults employed in public service and substantial student loan debt among these workers, the PSLF program is positioned to provide substantial debt relief for millions of workers, while also increasing the attractiveness of public service careers (Link et al., 2022). Yet, more than fifteen years after the introduction of PSLF and five years after the first cohorts of eligible borrowers would have demonstrated the 10 years of employment necessary for forgiveness, the number of borrowers who had received forgiveness stood at 233,230 at the end of October of 2022. Even as the PSLF waiver (which expired October 31, 2022), contributed to the substantial growth in the number of borrowers receiving PSLF relief, take-up has remained incomplete and the beneficiaries appear to have been drawn disproportionately from among the eligible borrowers with high-income and high education.

The unique circumstances of the period from the start of the pandemic in March of 2020 to September of 2023, which include a pause on student loan payments initially precipitated by the pandemic emergency and the political debate over potential loan cancellation, may have also impacted take-up of PSLF. The need for active choice and action related to student loan repayment may have been less salient to borrowers during the period of the payment pause (commencing in March 2020 and continuing to September 1, 2023.[32]) With more than three years without loan payments, eligible borrowers may have deferred actions needed to file the PSLF waiver or make

[32] Briones et al. (2023) document the institutional history of the pauses in student loan repayment and the connection of the payment pause to broad-based student loan forgiveness proposed by the Biden administration in August of 2022.

associated changes like loan consolidation or a shift in repayment plans. Nonetheless, the payment pause has distributional effects for potential PSLF recipients, as well, because the months of the payment pause (approximately 40) provide qualifying credits towards forgiveness with zero dollars for those employed in public service. These benefits are increasing in loan balances and larger for those who would have made the most progress to paying down balances under the fixed payment or income-based terms or PSLF.[33]

What is more, borrowers who believed that loan forgiveness from executive action proposed in August of 2022 would wipe out all or most of their student loan debt may have chosen to avoid the more administratively cumbersome PSLF application. We estimate that 28% of the PSLF borrowers who were eligible for forgiveness under the waiver would also have moved to zero balance under the proposed cancellation by executive action. These borrowers who would have received full forgiveness under executive action tended to have low average balances ($5,500) and were drawn disproportionately from those in the less than BA levels of degree attainment (see Appendix Table A4). For this same group, PSLF waiver application may have been impacted by behavioral biases of "time inconsistency" and "loss aversion" potentially attenuating take-up in the presence of potential forgiveness from executive action.[34]

A further barrier to PSLF application may be tied to limited information and the administrative burden of navigating the application process. While there have been some efforts to notify those with student loans of potential eligibility for PSLF and the particular opportunities

[33] To illustrate, a borrower employed in public service entering repayment in September of 2013 would be eligible for forgiveness after the completion of the 80 payments (to March of 2020) which would result in forgiveness of $8,319 for someone with an initial loan balance of $25,000 and $33,278 for someone with an initial loan balance of $100,000 (based on 10-year fixed payments at a 6.5% interest rate).

[34] "Time Inconsistency", which defines the reluctance to commit to activities that require present sacrifice in pursuit of future returns (O'Donoghue & Rabin, 1999), and "loss aversion", which represents the idea that the PSLF application most certainly involves a time cost while the gains are not certain (Kahneman & Tversky, 2000), likely deter take-up of the PSLF waiver among many borrowers.

of the PSLF waiver, these efforts have been largely limited to “light touch” outreach, including email messages from the Office of Federal Student Aid, posts on social media from the Secretary of Education and other leaders, and announcements from the White House.[35] Because navigating the steps for the completion of the PSLF waiver takes more than transitory effort and may yield questions tied to individuals’ unique circumstances, informational interventions that provide a “nudge” without more sustained guidance and troubleshooting are unlikely to be effective. Prior experiments have convincingly demonstrated that outreach efforts that provide administrative support to assist with the completion of forms and the submission of materials can increase take-up (Bettinger et al., 2012; Finkelstein & Notowidigdo, 2019). Yet, troubleshooting support for PSLF applicants has been decidedly limited, with long queues for responses from servicers or FSA.

Beyond efforts to provide outreach and assistance to PSLF-eligible borrowers, the implementation and administration of the PSLF program (and the associated waiver) involve cumbersome and unnecessary administrative hurdles. For example, while the basic form for employment certification is a short two pages, acceptable completion required a wet signature from a designated officer and submission by fax or regular mail (with only limited options for online filing) until May of 2023.[36] Greater automation of the processes of Federal Student Aid and the contracted loan servicers could alleviate some administrative burden and it should be acknowledged that the Office of Federal Student Aid has taken steps to streamline the process.

[35] An October 2021 press release from the Department of Education notes the availability of resources on the PSLF waiver on FSA’s website and their plan to communicate directly with borrowers. By mid-2022, several nonprofit and public benefit organizations such as PSLF.nyc, PSLF.us, and bysavi.com developed utilities and assistance materials to assist public service employers (and their employees) to complete employment certification forms in advance of the PSLF waiver deadline.

[36] Recent updates to the PSLF Help Tool allow borrowers to sign and submit their PSLF form digitally, along with allowing employers to submit forms with an e-signature; and track the status of their form. See: https://www.ed.gov/news/press-releases/us-department-education-announces-42-billion-approved-public-service-loan-forgiveness-more-615000-borrowers-october-2021

Indeed, because certification of employment for eligibility requires very basic human resources information about the duration of employment, direct electronic submission of employment information to the Department of Education would dramatically reduce the burden on borrowers.

Overall, the take-up of PSLF waivers would likely have a large impact on the economic security of many American workers with student loan debt. As we show, there are likely well over $100 billion at stake in immediate relief for as many as three-and-a-half million borrowers. While not an erasure of student loan obligations, take-up of the PSLF waiver would provide substantial relief for public service workers with considerable labor market experience. Among those who would be particularly likely to benefit are teachers, firefighters, police officers and social workers, while increased take-up would also go some distance to reducing the racial gap in student debt. We emphasize that our results focus exclusively on those eligible for immediate relief. A much larger population is likely to benefit from increased payment counts and expedited time to forgiveness afforded by the waiver process. In turn, a well-functioning PSLF program might also serve as a recruitment tool in public service occupations like teaching and nursing where employers have found recruiting difficult in recent years (García & Weiss, 2019; Rosseter, 2022).

Beyond the near-term question about the take-up of the PSLF waiver, there are a host of systemic questions about the incentives and long-term viability of the PSLF program and the broad array of income-based repayment programs. There is good reason for concern that unconstrained potential loan forgiveness through both PSLF and IDR programs may be contributing to related problems of overborrowing, moral hazard and tuition inflation which span all of post-secondary education but may be magnified at the graduate level. The focus of the PSLF waiver was on retroactive adjustments for administrative shortfalls in the original implementation of the program;

there remain substantial design flaws in the PSLF program and federal student lending more generally.

References

Bennett, N., King, M., & Klee, M. (2022). *Who is impacted by student loan forgiveness and how?* U.S. Census Bureau. https://www.census.gov/library/stories/2022/09/student-loan-forgiveness.html

Bettinger, E. P., Long, B. T., Oreopoulos, P., & Sanbonmatsu, L. (2012). The role of application assistance and information in college decisions: Results from the H&R Block FAFSA experiment. *The Quarterly Journal of Economics*, *127*(3), 12051242. https://doi.org/10.1093/qje/qjs017.

Black, S., Turner L., & Denning J. (2023*). Plus or minus? The effect of graduate school loans on access, attainment, and prices* [Working paper no. 31291]. National Bureau of Economic Research.

Briones, D., Powell E., & Turner S. (2023). Student loan payment pause benefits high-income households the most: With forgiveness uncertain, struggling borrowers are unprotected from risk. *Education Next*, *23*(3), 40–47.

Catherine, S., & Yannelis, C. (2023). The distributional effects of student loan forgiveness. *Journal of Financial Economics*, *147*(2), 297–316.

Consumer Financial Protection Bureau. (2013). *Public service and student debt: Analysis of existing benefits and options for public service organizations.* https://files.consumerfinance.gov/f/201308_cfpb_public-service-and-student-debt.pdf

Consumer Financial Protection Bureau. (2017). *Staying on track while giving back: The cost of student loan servicing breakdowns for people serving their communities.* https://www.consumerfinance.gov/data-research/research-reports/staying-track-while-giving-back-cost-student-loan-servicing-breakdowns-people-serving-their-communities/

Delisle, J. (2016). The coming public service loan forgiveness bonanza. *Economic Studies at Brookings, Evidence Speaks Reports*, *2*, 2. https://www.brookings.edu/wp-content/uploads/2016/09/es_20160922_delisle_evidence_speaks.pdf

Delisle, J., & Holt, A. (2014). *Zero marginal cost*. New America Foundation. https://www.newamerica.org/education-policy/policy-papers/zero-marginal-cost/

Delisle, J., & Holt, A. (2017). The tangled world of teacher debt: clashing rules and uncertain benefits for federal student-loan subsidies. *Education Next*, *17*(4), 42–48.

Delisle, J., & Cohn, J. (2022). *Master's degree debt and earnings: New federal data expose risks for students and the government*. Urban Institute. https://www.urban.org/research/publication/masters-degree-debt-and-earnings

Digest of Education Statistics. (2021). *Number, highest degree, and years of teaching experience of teachers in public and private elementary and secondary schools, by selected teacher* *characteristics: Selected years, 1999-2000 through 2017-18* [Data Set]. National Center for Education Statistics. https://nces.ed.gov/programs/digest/d21/tables/dt21_209.20.asp

Eaton, C., Goldstein, A., Hamilton, L., & Wherry, F. (2021). *Student debt cancellation is progressive: Correcting empirical and conceptual errors*. Roosevelt Institute. https://rooseveltinstitute.org/publications/student-debt-cancellation-is-progressive/

Examining the Policies and Priorities of the Office of Federal Student Aid, 117 Cong. (2021). https://files.eric.ed.gov/fulltext/ED625827.pdf

Federal Student Aid. (2022). *The U.S. Department of Education offers low-interest loans to eligible students to help cover the cost of college or career school*. https://studentaid.gov/understand-aid/types/loans/subsidized-unsubsidized.

Federal Student Aid. (2023). *Federal Student Loan Portfolio* (Q2 2023) [Data set]. Department of Education. https://studentaid.gov/data-center/student/portfolio

Federal Student Aid. (n.d.). *Public Service Loan Forgiveness (PSLF)*. https://studentaid.gov/manage-loans/forgiveness-cancellation/public-service

Feng, L., & Sass, T. R. (2018). The impact of incentives to recruit and retain teachers in “hard-to-staff” subjects. *Journal of Policy Analysis and Management*, *37*(1), 112–135. https://doi.org/10.1002/pam.22037

Field, E. (2009). Educational debt burden and career choice: Evidence from a financial aid experiment at NYU Law School. *American Economic Journal: Applied Economics, 1*(1), 1–21. http://dx.doi.org/10.1257/app.1.1.1

Finkelstein, A., & Notowidigdo, M. (2019). Take-up and targeting: Experimental evidence from snap. *Quarterly Journal of Economics*, 134(3), 1506–1556.

García, E., & Weiss, E. (2019). *The teacher shortage is real, large and growing, and worse than we thought.* Economic Policy Institute. https://files.eric.ed.gov/fulltext/ED598211.pdf

Gershenson, S., Hart, C. M., Hyman, J., Lindsay, C. A., & Papageorge, N. W. (2022). The long-run impacts of same-race teachers. *American Economic Journal: Economic Policy*, *14*(4), 300–342. http://doi.org/10.1257/pol.20190573

Goss, J., Mangrum, D., & Scally, J. (2023). Assessing the relative progressivity of the Biden administration’s federal student loan forgiveness proposal. *FRB of New York Staff Report* (1046). http://dx.doi.org/10.2139/ssrn.4317144

Herd, P., & Moynihan, D. P. (2019). *Administrative burden: Policymaking by other means*. Russell Sage Foundation.

Hoblitzell, B., Foss, I., & Weigle, D. (2015). *Public Service Loan Forgiveness* [PowerPoint slides]. Federal Student Aid. https://fsapartners.ed.gov/sites/default/files/attachments/2019-07/2015FSAConfSession5.ppt

Jacob, B., Jones, D., & Keys, B. J. (2023). *The value of student debt relief and the role of administrative barriers: evidence from the teacher loan forgiveness program* [Working paper no. 31359]. National Bureau of Economic Research.

Kahneman, D., & Tversky, A. (2000). Choices, values and frames. Cambridge University Press.

Lochner, L., Stinebrickner, T., & Suleymanoglu, U. (2021). Parental support, savings, and student loan repayment. *American Economic Journal: Economic Policy*, *13*(1), 329–371.

Link, E., Romero, J. S., & Turner, S. (2022). The potential impact of public service student loan forgiveness in the fifth district. *Richmond Fed Economic Brief, 22*(29). https://www.richmondfed.org/publications/research/economic_brief/2022/eb_22–29

Looney, A. (2022). Student loan forgiveness is regressive whether measured by income, education, or wealth. *Hutchins Center Working Papers* (75). https://www.brookings.edu/wp-content/uploads/2022/01/WP75-Looney_updated_1.pdf

Matthews, D., Lind, D., & Lowrey, A. (2022, May 17). The scourge of the "time tax.” In *The Weeds*. Vox. https://podcasts.apple.com/ee/podcast/the-scourge-of-the-time-tax/id1042433083?i=1000561988613

Miller, B. (2019). *The continued student loan crisis for black borrowers*. Center for American Progress. https://files.eric.ed.gov/fulltext/ED602791.pdf

Mueller, H., & Yannelis, C. (2022). Increasing enrollment in income-driven student loan repayment plans: evidence from the navient field experiment. *The Journal of Finance, 77*(1), 367–402. https://doi.org/10.1111/jofi.13088

Mullainathan, S., & Shafir, E. (2013). *Scarcity: Why having too little means so much*. Times Books.

O’Donoghue, T., & Rabin, M. (1999). Doing it now or later. *The American Economic Review*, *89*(1), 103-124.

Powell, E., & Turner, S. (2022). *Public Service Loan Forgiveness Waivers: A Time-Limited Opportunity for Debt Relief* [Unpublished manuscript]. Department of Economics, University of Virginia.

Project on Student Debt. (2006). *Addressing student loan repayment burdens: Strengths and weaknesses of the current system* [White Paper]. https://www.pewtrusts.org/-/media/legacy/uploadedfiles/wwwpewtrustsorg/reports/student_debt/studentdebtwhitepaper0206pdf.pdf

Rosseter, R. (2022). *Nursing shortage fact sheet*. American Association of Colleges of Nursing. https://www.aacnnursing.org/news-data/fact-sheets/nursing-shortage

Scott-Clayton, J., & Li, J. (2016). Black-white disparity in student loan debt more than triples after graduation. *Economic Studies*, Volume 2 No. 3.

White House. (2022). *Fact sheet: President Biden announces student loan relief for borrowers who need it most*. https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/24/fact-sheet-president-biden-announces-student-loan-relief-for-borrowers-who-need-it-most

Tables and Figures

Table 1. Summary statistics, SIPP (2018).

	Ages 22-60, not enrolled in school			All borrowers			Immediate PSLF eligible		
	Median	Mean	SD	Median	Mean	SD	Median	Mean	SD
Panel A: Demographics									
Male	-	0.498	0.500	-	0.414	0.493	-	0.325	0.469
White	-	0.771	0.42	-	0.750	0.433	-	0.751	0.433
Black	-	0.131	0.337	-	0.170	0.376	-	0.172	0.377
Age	42	42	11.043	35	37	9.725	41	43	7.536
Panel B: Employment									
Annual income	34,188	54,006	83,551	44,976	59,284	68,084	60,673	69,622	50,784
No job	-	0.239	0.427	-	0.142	0.349	-	0	0
Private/Self-employed	-	0.591	0.492	-	0.583	0.493	-	0	0
Government	-	0.110	0.312	-	0.162	0.369	-	0.626	0.484
Not-for-profit	-	0.061	0.238	-	0.113	0.316	-	0.374	0.484
Potential experience	15	16.157	13.168	11	13.101	10.335	19	20.217	7.633
Panel C: Education									
HS or less	-	0.340	0.474	-	0	0	-	0	0
SC/AA	-	0.303	0.460	-	0.347	0.476	-	0.207	0.405
BA	-	0.230	0.421	-	0.388	0.487	-	0.333	0.472
Graduate	-	0.127	0.333	-	0.265	0.441	-	0.461	0.499
Education debt balance	0	4,764	19,843	20,000	33,764	42,845	22,700	39,604	47,817
Sample Obs		28,115			3,564			658	
Pop Weighted Obs		148 million			19.8 million			3.5 million	

Notes: This table provides summary statistics for the main variables in the analysis for individuals ages 22-60 and not enrolled in college during 2017. All statistics are weighted using the SIPP December final person weights. The left panel displays statistics for the full sample, the middle panel displays statistics for all student borrowers, and the right panel for those who are likely eligible for immediate PSLF relief. PSLF relief eligible is defined as those student debt holders whose primary sector of employment is government or not-for-profit and have at least 10 years of potential experience and work full-time, where experience is defined as age-education-6. See Appendix B for additional sample and variable definition details. All monetary variables are in terms of 2017 dollars.

Table 2. Debt shares and balances by subgroup, at least some college, SIPP (2018).

	Post-secondary attendees, ages 22-60, not enrolled in school					Immediate PSLF eligible borrowers				
	Share with debt		Debt balance | Debt			Immediate PSLF eligible share		Debt balance | Debt		
	(1)		(2)			(3)		(4)		
	Mean	SD	Median	Mean	SD	Mean	SD	Median	Mean	SD
Total	0.203	0.403	20,000	33,764	42,845	0.035	0.185	22,700	39,604	47,817
Panel A: Race										
White	0.198	0.399	20,000	33,418	43,273	0.035	0.183	22,000	38,923	47,481
Black	0.286	0.452	20,000	33,976	40,596	0.050	0.218	30,000	48,128	54,714
Other groups	0.148	0.355	20,000	36,563	43,522	0.025	0.156	20,000	27,289	28,007
Panel B: Education										
SC/AA	0.153	0.360	12,000	18,852	21,066	0.016	0.125	14,000	23,255	28,736
BA	0.227	0.419	20,000	26,983	26,365	0.034	0.181	20,000	28,329	29,275
Graduate	0.281	0.449	40,000	63,217	64,086	0.085	0.279	32,000	55,086	59,440
Panel C: Income Decile										
0-10%	0.123	0.329	18,000	26,165	29,504	0	0	0	0	0
10-20%	0.165	0.371	15,000	27,464	36,724	0.004	0.066	8,000	59,663	92,816
20-30%	0.192	0.394	18,000	25,728	27,812	0.013	0.111	22,000	33,136	43,211
30-40%	0.199	0.400	15,700	26,140	31,601	0.028	0.166	20,000	33,966	37,922
40-50%	0.221	0.415	15,000	24,411	27,948	0.039	0.194	15,000	21,412	20,211
50-60%	0.238	0.426	20,000	34,962	41,249	0.053	0.224	27,000	44,273	48,859
60-70%	0.237	0.425	20,000	35,149	42,518	0.058	0.233	20,000	39,408	48,608
70-80%	0.237	0.426	20,000	37,121	47,197	0.066	0.249	24,000	37,014	40,039
80-90%	0.212	0.409	20,000	38,256	47,731	0.045	0.208	25,000	36,134	42,769
90-100%	0.176	0.381	21,000	45,898	58,190	0.019	0.137	42,000	75,900	79,007
Panel D: Occupation										
Manager	0.184	0.388	20,000	35,935	45,726	0.033	0.180	30,000	49,209	54,133
Social Worker	0.369	0.483	36,000	51,272	51,801	0.152	0.360	38,000	47,385	42,163
Teacher	0.311	0.463	25,000	35,634	42,547	0.178	0.383	20,000	37,328	45,804
Medical Doctor	0.286	0.453	100,000	119,520	86,655	0.055	0.228	216,000	156,225	81,553
Protective Serv.	0.215	0.411	17,000	31,034	40,948	0.124	0.331	26,000	38,100	50,505
Nurse	0.321	0.467	21,000	31,152	32,222	0.093	0.291	18,000	29,430	33,657
Observations	17,960		3,564			17,960		658		

Notes: This table provides the within group share with debt (columns 1 and 3) and debt balances conditional on having debt (columns 2 and 4) for individuals ages 22-60, not enrolled in college during 2017, and with at least some college experience. Columns 1 and 2 show within group shares and balances for the full sample while columns 3 and 4 focus on the within group shares with immediate PSLF eligible debt and the debt balances of the immediate PSLF eligible borrowers. All statistics are weighted using the SIPP December final person weights. See Appendix B for additional sample and variable definition details. All monetary variables are in terms of 2017 dollars.

Table 3. Alternative immediate PSLF eligible sample definitions and estimates of distributional implications, SIPP (2018).

	Potential experience		Potential experience + full-time		Graduate potential experience + full-time		Pre-2017 experience		Pre-2017 experience + full-time	
	(1)		(2)		(3)		(4)		(5)	
	% Individuals	% PSLF $	% Individuals	% PSLF $	% Individuals	% PSLF $	% Individuals	% PSLF $	% Individuals	% PSLF $
Panel A: Race										
White	0.747	0.738	0.751	0.738	0.755	0.744	0.737	0.745	0.747	0.75
Black	0.171	0.205	0.172	0.209	0.170	0.207	0.188	0.199	0.187	0.201
Other groups	0.082	0.056	0.077	0.053	0.075	0.049	0.075	0.057	0.066	0.05
Panel B: Education										
SC/AA	0.213	0.124	0.207	0.121	0.211	0.130	0.206	0.177	0.207	0.174
BA	0.341	0.251	0.333	0.238	0.340	0.255	0.269	0.206	0.26	0.202
Graduate	0.446	0.625	0.461	0.641	0.448	0.615	0.525	0.617	0.533	0.623
Panel C: Income Decile										
0-10%	0	0	0	0	0	0	0	0	0	0
10-20%	0.021	0.02	0.01	0.014	0.010	0.015	0.015	0.013	0.013	0.009
20-30%	0.044	0.035	0.027	0.023	0.028	0.024	0.018	0.011	0.01	0.007
30-40%	0.064	0.054	0.063	0.054	0.065	0.058	0.029	0.018	0.03	0.019
40-50%	0.096	0.054	0.098	0.053	0.100	0.057	0.096	0.066	0.097	0.066
50-60%	0.143	0.159	0.145	0.162	0.148	0.173	0.124	0.167	0.122	0.167
60-70%	0.18	0.183	0.185	0.185	0.186	0.184	0.196	0.221	0.198	0.22
70-80%	0.219	0.207	0.232	0.217	0.230	0.208	0.224	0.189	0.225	0.189
80-90%	0.162	0.153	0.166	0.151	0.167	0.161	0.225	0.201	0.235	0.207
90-100%	0.071	0.135	0.073	0.141	0.067	0.119	0.072	0.113	0.071	0.116
Panel D: Occupation										
Manager	0.1	0.124	0.102	0.127	0.102	0.130	0.102	0.113	0.106	0.116
Social worker	0.057	0.07	0.057	0.068	0.058	0.073	0.051	0.037	0.054	0.038
Teacher and school admin	0.235	0.222	0.241	0.227	0.245	0.243	0.339	0.323	0.35	0.33
Medical doctor	0.017	0.065	0.016	0.065	0.009	0.030	0.004	0.026	0.004	0.027
Protective services	0.041	0.04	0.044	0.042	0.045	0.045	0.048	0.078	0.05	0.081
Nurse	0.107	0.081	0.105	0.078	0.108	0.084	0.085	0.072	0.08	0.07
Weighted Counts (in millions)	3.73	$144,647.80	3.45	$136,783.8	3.38	$127,780.86	1.22	$40,499.39	1.17	$39,438.28

Notes: This table presents estimates of the PSLF distributional implications under full take-up using four alternative sample definitions of the immediate PSLF eligible group. Column 2 is our preferred specification. See Appendix B for details on sample definitions. "% Individuals" columns are the subgroup proportion of individuals receiving PSLF and "% PSLF $" columns are the subgroup proportion of PSLF dollars received. Within a panel, percentages may not add up to one due to rounding. The bottom panel displays estimates of aggregate counts and debt balances potentially eligible for the waiver under each specification using SIPP December weights. All monetary values are in terms of 2017 dollars.

Table 4. Distributional implications of PSLF by take-up scenario, SIPP (2018).

	Full		By Education		By Income		By Education-Income		By Occupation	
	(1)		(2)		(3)		(4)		(5)	
	% Individuals	% PSLF $	% Individuals	% PSLF $	% Individuals	% PSLF $	% Individuals	% PSLF $	% Individuals	% PSLF $
Panel A: Race										
White	0.744	0.728	0.759	0.731	0.734	0.730	0.744	0.723	0.755	0.748
Black	0.181	0.218	0.172	0.225	0.176	0.210	0.170	0.225	0.169	0.201
Other groups	0.075	0.054	0.069	0.044	0.090	0.061	0.086	0.052	0.075	0.051
Panel B: Education										
SC/AA	0.203	0.118	0.065	0.030	0.168	0.097	0.053	0.024	0.180	0.114
BA	0.333	0.241	0.105	0.062	0.326	0.220	0.093	0.051	0.338	0.248
Graduate	0.464	0.640	0.830	0.909	0.506	0.683	0.854	0.925	0.482	0.639
Panel C: Income Decile										
0-10%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10-20%	0.011	0.014	0.016	0.019	0.020	0.016	0.028	0.032	0.021	0.026
20-30%	0.032	0.026	0.030	0.029	0.040	0.028	0.033	0.029	0.048	0.037
30-40%	0.063	0.053	0.044	0.042	0.055	0.041	0.039	0.034	0.063	0.054
40-50%	0.106	0.065	0.052	0.033	0.058	0.033	0.036	0.021	0.100	0.067
50-60%	0.142	0.156	0.124	0.141	0.079	0.076	0.063	0.065	0.142	0.146
60-70%	0.180	0.183	0.200	0.193	0.148	0.140	0.153	0.137	0.186	0.195
70-80%	0.229	0.211	0.240	0.209	0.203	0.173	0.202	0.161	0.218	0.202
80-90%	0.159	0.143	0.190	0.147	0.218	0.195	0.228	0.170	0.153	0.146
90-100%	0.079	0.148	0.104	0.188	0.178	0.300	0.217	0.351	0.071	0.127
Panel D: Occupation										
Manager	0.102	0.131	0.070	0.105	0.074	0.100	0.034	0.056	0.071	0.094
Social worker	0.062	0.074	0.051	0.060	0.035	0.045	0.018	0.024	0.044	0.055
Teacher and school admin	0.234	0.225	0.207	0.208	0.139	0.143	0.075	0.087	0.329	0.327
Medical doctor	0.019	0.063	0.023	0.072	0.021	0.067	0.017	0.055	0.013	0.047
Protective services	0.043	0.045	0.013	0.010	0.037	0.048	0.009	0.010	0.058	0.063
Nurse	0.100	0.070	0.040	0.036	0.076	0.054	0.023	0.020	0.074	0.055

Notes: This table presents the distributional implications of PSLF given full take-up (column 1) and differential take-up by education (column 2), personal income (column 3), joint education and income (column 4), and occupation (column 5). "% Individuals" columns are the subgroup proportion of individuals receiving PSLF and "% PSLF $" columns are the subgroup proportion of PSLF dollars received. We use prior period (2021) take-up given subgroup and the probability of subgroup eligibility in our sample to derive the expected number of PSLF participants and the expected level of debt relieved using 10,000 draws of proportional sampling under each scenario in columns 1 through 5. See the section, "Consistency and Robustness Checks," of the main text for additional details. Within a panel, percentages may not add up to one due to rounding.

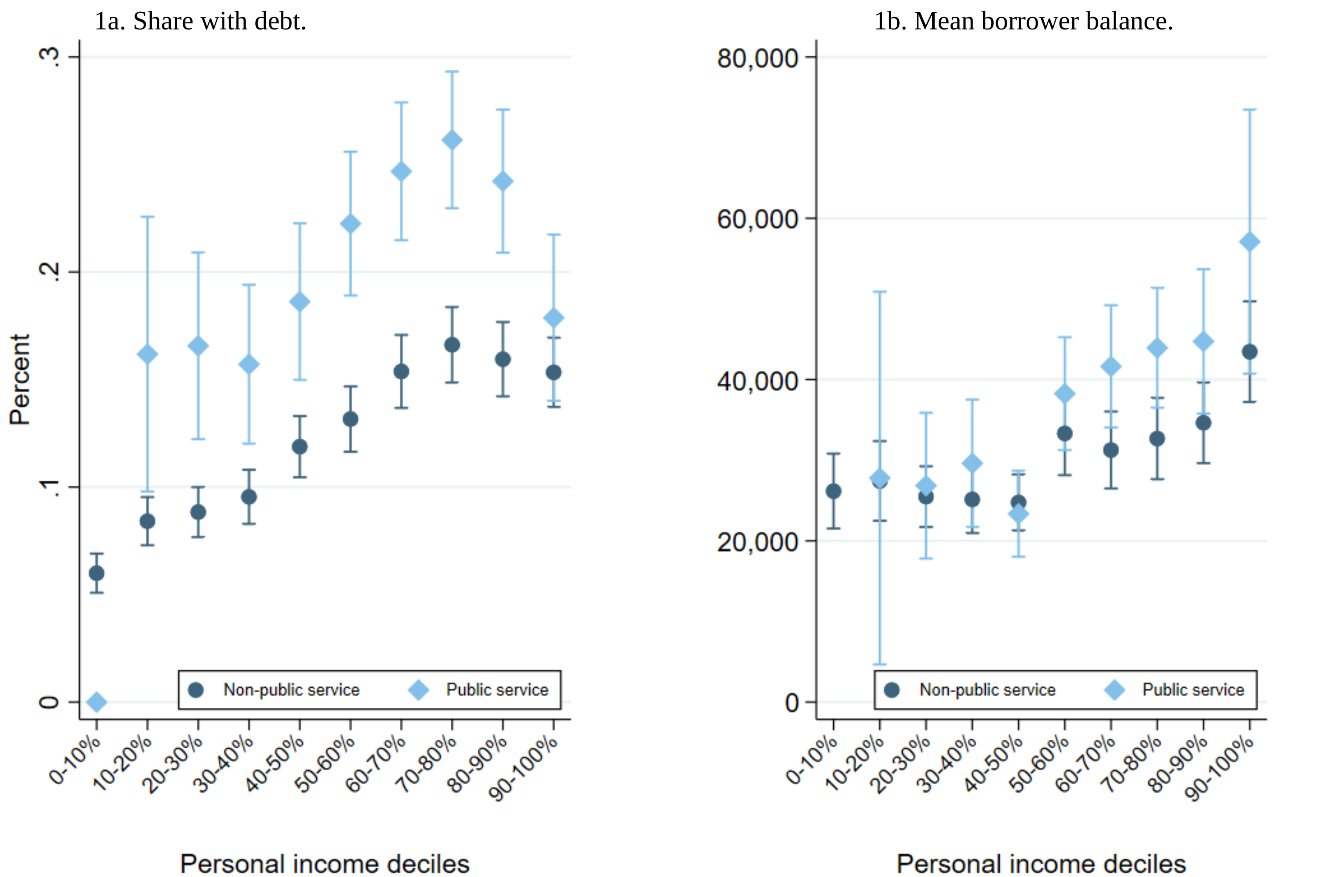
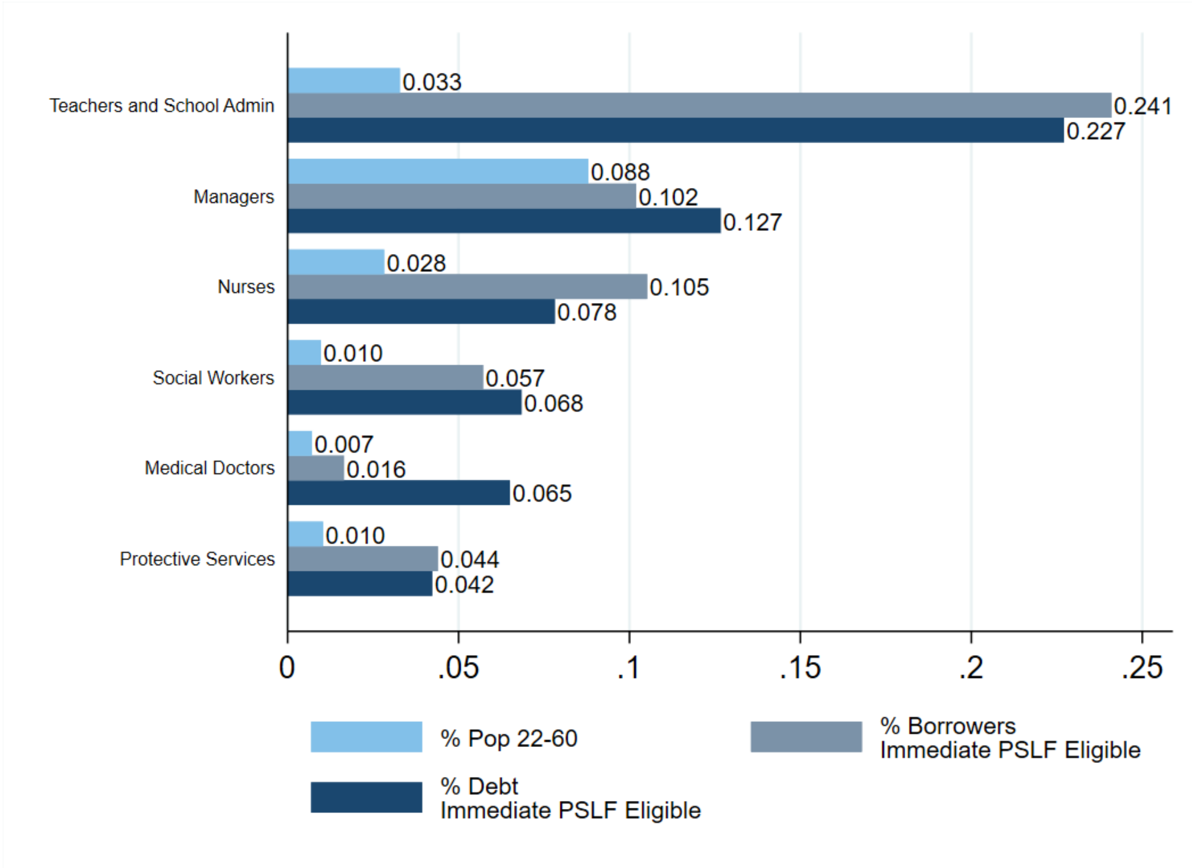


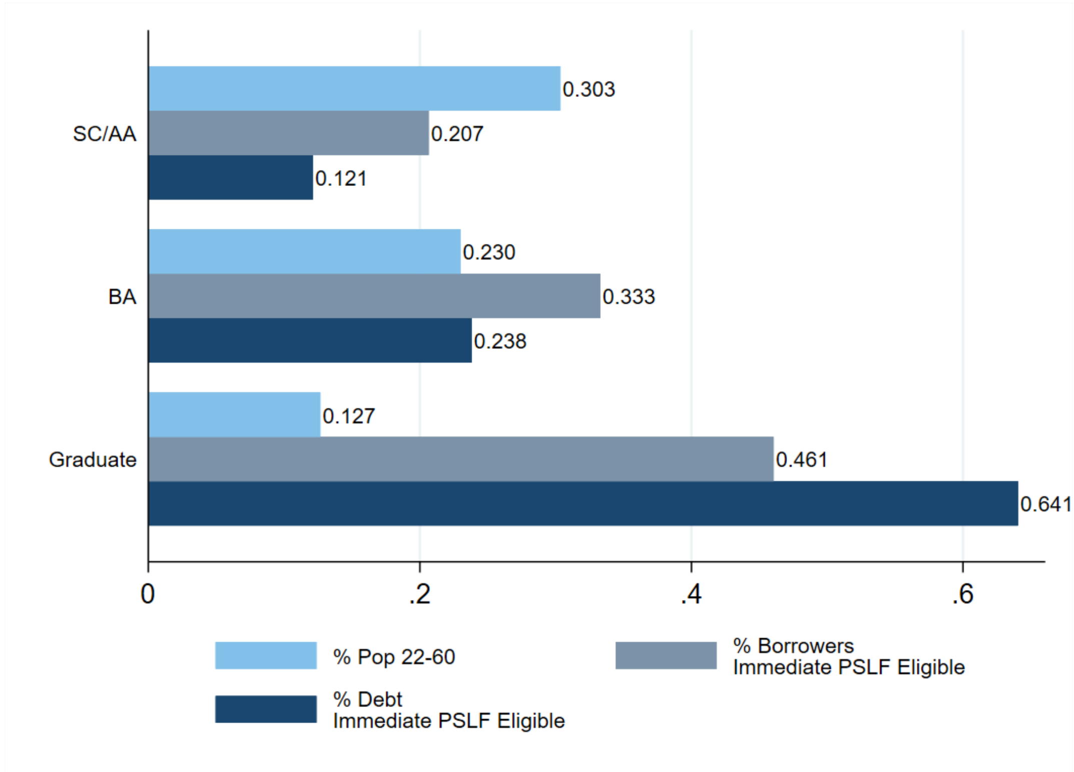
Figure 1 (a)–(b). Distribution of student borrowing and student debt, public sector, SIPP (2018).

Notes: This figure displays the share of individuals with student debt (panel 1a) and the mean per capita student loan balance of borrowers (panel 1b) by cohort personal income decile and sector of primary employment. The sample includes individuals ages 22 to 60 with at least some college experience. Public service includes all individuals working for government or not-for-profit employers. Non-public service individuals include those without a job, are working for a private, for-profit employer, or are self-employed. Details on cohort-income deciles can be found in Appendix Table A1. Additional sample construction and variable descriptions can be found in Appendix B. Mean estimates and 95% confidence intervals are reported from OLS regressions on decile dummies using SIPP December final person weights. All monetary variables are in terms of 2017 dollars.

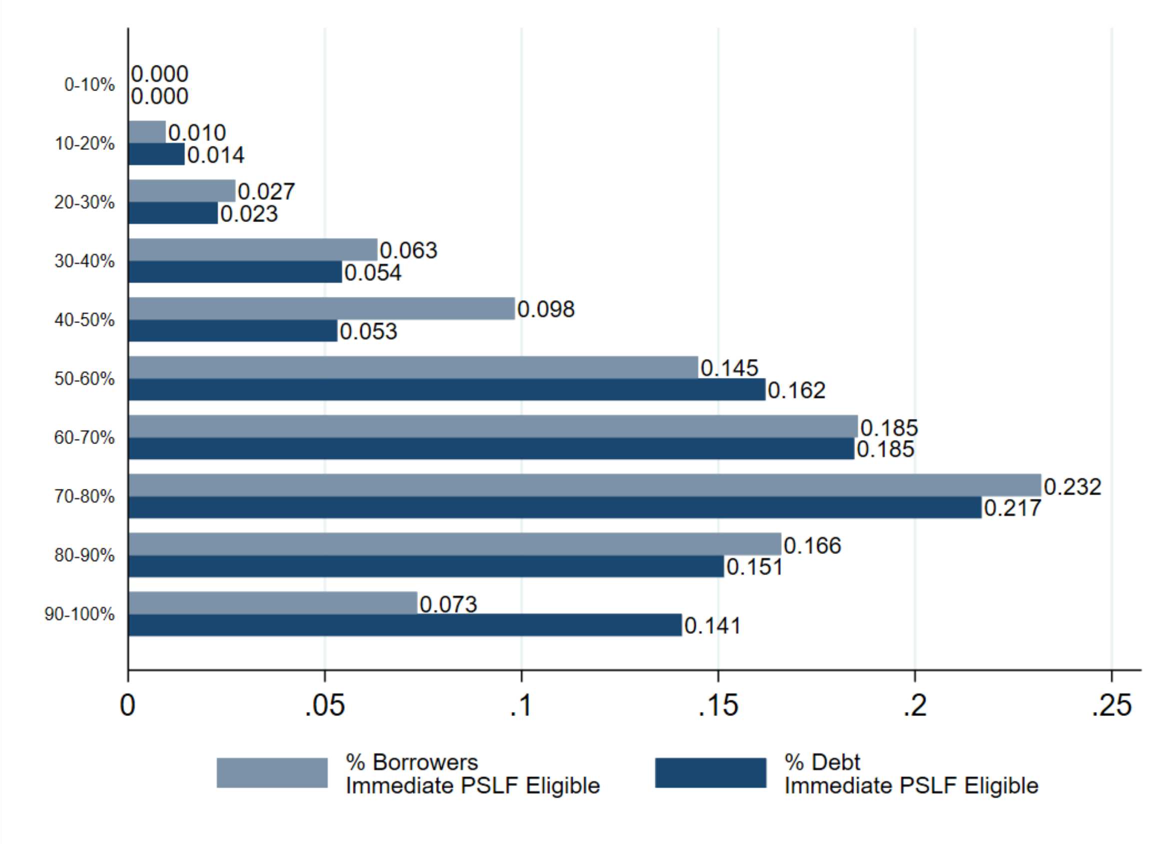
2a. Public service occupations with largest aggregate immediate PSLF eligible debt.



2b. Education.



2c. Personal income decile.



2d. Race.

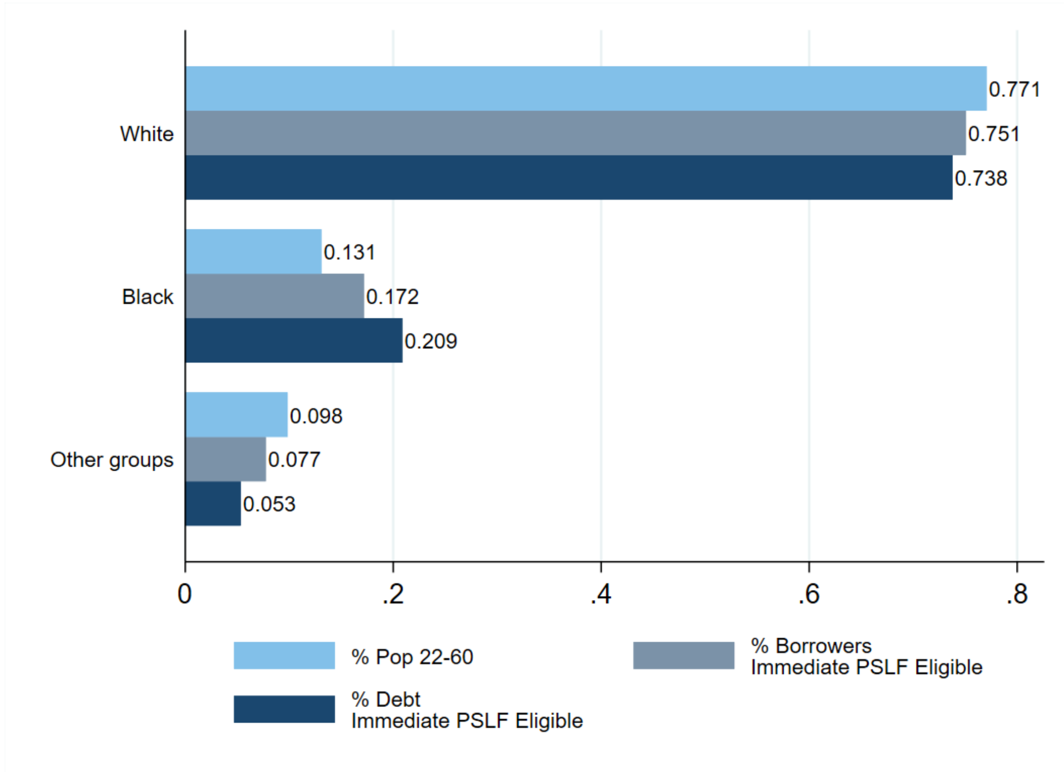
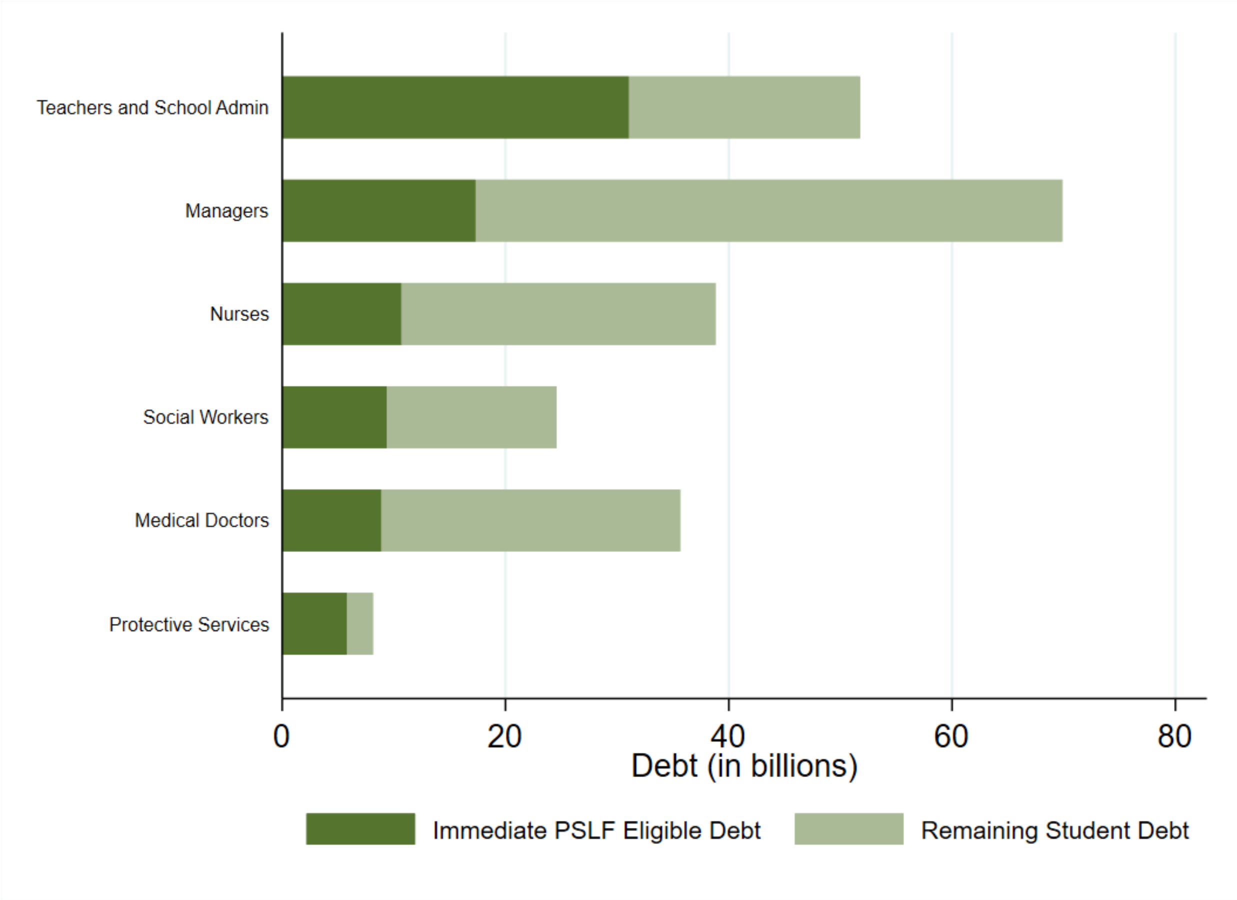


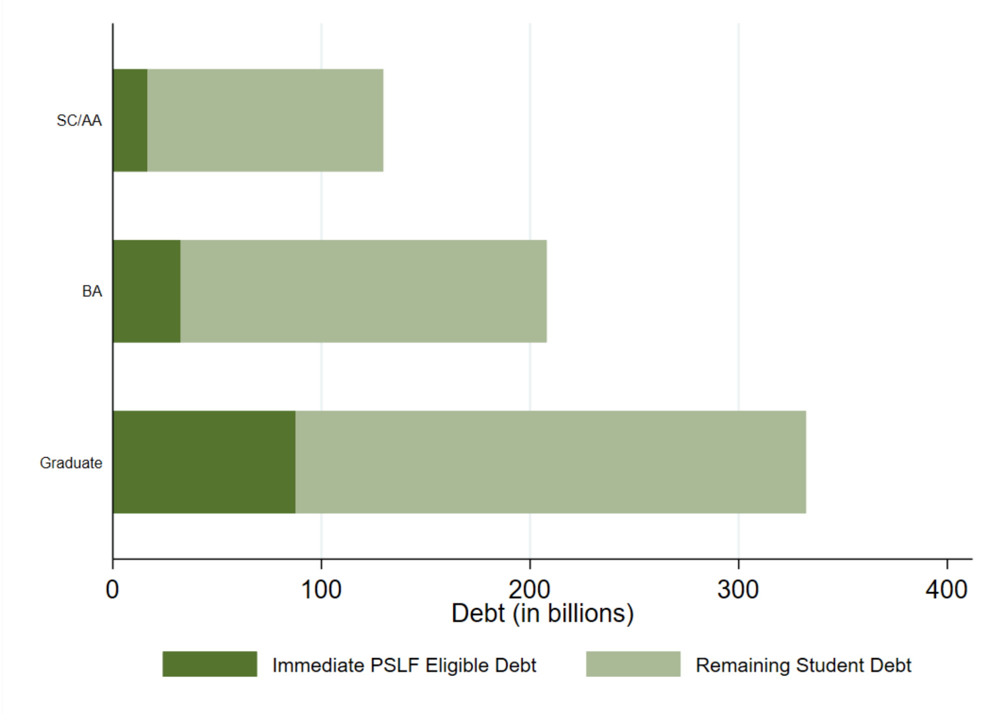
Figure 2 (a)–(d). Proportion of immediate PSLF eligible employees and debt across subgroup, SIPP (2018).

Notes: These figures illustrate the proportion immediate PSLF eligible employees and debt across occupation (panel 2a), educational attainment (panel 2b), personal income (panel 2c), and race (panel 2d). Estimates are conditional on being part of the immediate PSLF eligible group. Variable definitions follow our sample construction described in Appendix B. Additional details on income deciles can be found in Appendix Table A1.

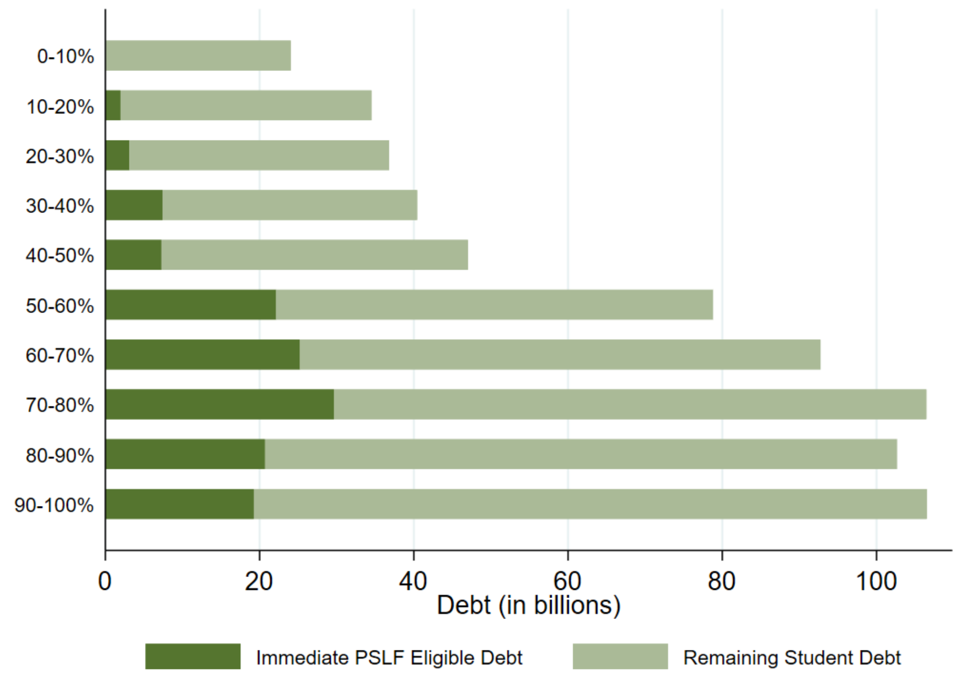
3a. Public service occupations with largest aggregate immediate PSLF eligible debt.



3b. Education.



3c. Personal income decile.



3d. Race.

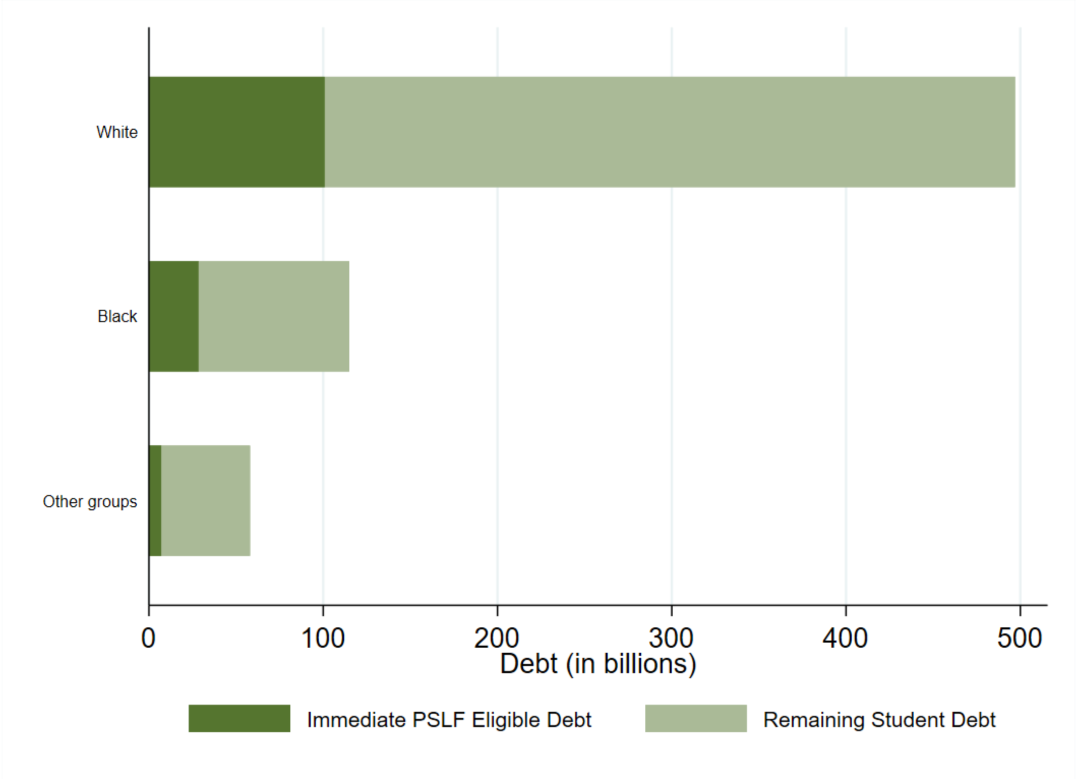


Figure 3 (a)–(d). Total student debt and immediate PSLF eligible debt within subgroup, SIPP (2018).

Notes: These figures illustrate total student debt and immediate PSLF eligible debt by occupation (panel 3a), educational attainment (panel 3b), personal income (panel 3c), and race (panel 3d). Aggregates are weighted using the SIPP December final person weights. Variable definitions follow our sample construction described in Appendix B. Additional details on income deciles can be found in Appendix Table A1.