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 access 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 take-up benefits.

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1. 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 on student debt with just over $1.6 trillion held across more than 43 million borrowers (Federal Student Aid, 2022).

Part of the low take-up of PSLF has likely been a result of the 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.[1] Essentially, these changes allow high tenure public service workers to gain forgiveness retroactively.

[1] In addition, the Department of Education announced additional policy modifications in the form of proposed payment count adjustments in April of 2022; however, as of this writing those changes have not been implemented.

In this paper, we explore the overall impact and distributional implications of potential full participation in loan forgiveness enabled by the PSLF waiver program.[2] We use information on individual student debt, earnings, 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 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 burden.

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 of 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.[3] 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

[2] 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.

[3] Well in advance of the August 2022 announcement, social scientists explored the distributional implications of different across-the-board forgiveness and repayment relief strategies (Looney, 2019; Catherine and Yannelis, 2021; Eaton et al., 2021). 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 and the fate of the plan rests on the outcome of Supreme Court cases which were heard February 28, 2023, with a ruling expected in May of 2023. An open question is whether the proposed loan forgiveness by executive action made the PSLF application process less salient for some borrowers, further reducing take-up rates.

2. 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 and Hart, 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.[4] 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.[5]

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

[4] Feng and Sass (2017) evaluate one such program specific to Florida and find that the relatively generous loan forgiveness substantially reduced attrition from hard-to-staff subjects.

[5] 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.

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 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.[6]

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."[7] 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.[8]

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 (legal aid, public defender, etc.) or in the commercial sector, with the latter generally providing appreciatively more remunerative compensation. In principle,

[6] 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.
[7] Delisle (2016) cites statements from Republicans (John Kasich) and Democrats (Hilary Clinton) alike supporting public service debt relief.
[8] 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."

about 23% of jobs in the United States are covered[9] and range from careers commonly associated with public service such as teaching, social work, and protective services to occupations like accounting or other administrative services for which there are positions with similar skill requirements in both public and private sectors.

2.1 PSLF Policy Context

The budget implications of the PSLF program were likely not well-understood at the time 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.[10]

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

[9] 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.

[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 Office of Federal Student Aid (2022).

In the years after the passage of PSLF, 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 combination of PSLF and new income driven repayment programs may have also contributed to rising debt levels.

A 2015 Department of Education report showed that of borrowers who had certified PSLF employment, nearly 30% had more than $100,000 in student loans (Hoblitzell, Foss, and Weigle, 2015). Given that nearly 80% of those enrolled in PSLF at this point had balances in excess of the maximum for undergraduate borrowing ($31,000 for dependent undergraduates and $57,500 for independent undergraduate students), these balances present clear evidence of the dominance of graduate education as the source of debt among those initially certified PSLF borrowers.

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 miniscule number of borrowers finding PSLF relief in 2017, policy discussion shifted away from the discussion of potential budget liability to the identification of administrative problems that were inhibiting take-up.

2.2 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 "certified", they need to be in the "right" type of repayment program,[11] and they need to have the "right" type of federal student loans. 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 (October 2021) more dramatically changed eligibility. Nearly all student loan borrowers employed full-time in public service occupations who were not in default became retroactively eligible to have prior payments on *any* repayment plan and periods of forbearance "count" as 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

[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 which would shorten the time to forgiveness. In order to gain eligibility, borrowers are 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; Figure C1 presents a timeline of policy action.)

Four primary challenges 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. 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. [13] Under the waiver, *borrowers could retroactively receive credit for prior periods of repayment on other loans paid before consolidation*, though borrowers still needed to complete a consolidation to a Direct Loan before forgiveness under PSLF.
2) **Credit to Repayment Counts paid under Ineligible Payment Plan:** 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. Under the waiver, *borrowers could receive retroactive credit on payment periods under the wrong repayment plan*. [14]
3) **Credit to Repayment Counts for Forbearance and Deferment Periods**:[15] *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 notes that borrowers qualifying for forgiveness under these one-time adjustments will begin

[13] 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.

[14] 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.

[15] 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.

to see loans forgiven in spring 2023, with the other remaining borrowers' accounts reflecting the adjustment in summer 2023.

4) **Flexibility for Previously Non-Eligible Payments and Borrowers:** Borrowers could retroactively count periods of payment in which they were pursuing Teacher Loan Forgiveness[16] and count late and partial payments. 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 stand to gain under these different waiver provisions? The Department of Education does not know.[17] The absence of data linking employment histories, loan balances, and repayment histories makes this impossible to know with certainty.

The aim of this analysis is to use available, nationally representative survey data to, first, estimate the number of borrowers likely eligible and, second, to gain a better understanding of the characteristics of these borrowers and the distributional implications of loan cancellation under the PSLF waiver. In the final section, we consider how differential take-up tied to employment and demographic characteristics would impact the distributional effects of the PSLF program.

3. Data Availability and Descriptive Statistics

To measure student debt in relation to public service employment, we use the Survey of Income and Program Participation (SIPP). The SIPP captures information on income, employment, household composition, demographic characteristics, government program

[16] 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.

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

participation and financial assets and liabilities, including student debt. Importantly, the survey identifies whether respondents are self-employed, are working for a for-profit company, are working for a not-for-profit enterprise or are working for the government. Our analysis focuses on the initial wave of the 2018 panel in which participants were interviewed in 2018 about activities in 2017.

While prior work exploring the impacts of student loan forgiveness has used the Survey of Consumer Finances (Catherine and Yannelis 2021; Eaton et al. 2021), the SIPP has the advantage of information about employer organizational control, crucial for identifying the set of potentially PSLF-eligible borrowers. Moreover, we observe a relatively large set of student borrowers in the SIPP, allowing us to examine distributional implications across various characteristics including race, income, educational attainment, and occupation.

We limit our analysis to individuals between the ages 22 and 60 and who were not enrolled in college, resulting in a sample size of 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 in order to produce counts that are nationally representative.[18]

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

[18] Compared to the analogous sample from the 2019 SCF constructed by Catherine and Yannelis (2021), 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 (2021). 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.

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 that lead to PSLF access (27.5% versus 17.1%).

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, earnings 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 briefly. 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 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.

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 earnings in the middle of the overall income distribution: they are underrepresented in the bottom 3 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.

The focus of our analysis is on the distributional implications of debt relief under the PSLF program, with particular attention to eligibility under the waiver. 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. To approximate eligibility with data available,[19] we classify individuals as "immediate PSLF eligible" if they have at least ten years of experience (defined as age less years of education less six), report working for the

[19] The components of eligibility that are not observed include the history of employment (not just the current employer), when a borrower commenced repayment, and other details about their loans such as the type of loan, repayment plan and forbearance / default.

government or working for a non-profit enterprise, and report working for at least an average of 30 hours per week (see Data Appendix for details).[20] Estimates of the distributional implications are robust to alternative specifications of eligibility, including the most restrictive definition where the immediately eligible must be entering into 2017 with a public service job they report having held since at least 2007 (see Appendix Table A2).

The final panels of Tables 1 and 2 provide descriptive statistics for the pool estimated to be eligible for immediate PSLF relief. 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 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).

4. Potential Impact of the PSLF Waiver: Level and Distribution of Immediate Forgiveness

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.[21] We emphasize that this is a "best available" estimate because there

[20] A potential concern is that our primary definition of "immediate PSLF eligible" captures some workers who have yet to accumulate 10 years of working service in the public and/or non-profit sectors and misses some eligible individuals who already have 10 years of public service, but do not report working in the public sector at the time of the interview. 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).

[21] This estimate is consistent with the back of the envelope estimate of $125.6 billion (2.8 million borrowers) that comes from applying employment fractions to the known level of debt outstanding. Specifically, with $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).

are several factors that determine eligibility for immediate PSLF relief that we are unable to incorporate.[22]

4.1 Distributional Effects of Immediate PSLF Eligibility

Who are these potential beneficiaries of immediate PSLF relief? 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 2, Panel A.

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 (dark blue bars, Figure 2). 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. 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 2,

[22] One of the most substantial data challenges comes from the absence of longitudinal data on employment history as we are unable to observe past employment experiences tied to either sector of employment or hours worked; note that some workers may have accumulated 10 years of public experience before the survey year while others currently in the public sector may have been in other sectors or out of the labor force in prior years. Other factors affecting estimates include the borrower repayment history (including defaults would reduce the number potentially eligible). Finally, the SIPP appears to undercount borrowers while the 2018 year of observation does not capture the contemporaneous debt situation. See Data Appendix for full discussion.

Panel B). 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 Panel C of Figure 2, 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.

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 Panel D of Figure 2.

4.2 Impact of Immediate PSLF Eligibility on Student Debt Burdens

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.[23] The potential impact of the waivers is much more targeted than an across-the-board

[23] 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 the Data Appendix for more information.

debt relief policy. Groups concentrated in the public sector with high debt balances would see the largest impact. Figure 3 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 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 B, 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-earnings 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.[24]

As we have documented above, Black Americans are more likely than other racial groups to hold student debt and to 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 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.

5. 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, with only 342,898 borrowers in

[24] 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.

the lifetime of the program receiving forgiveness through the end of 2022.[25] To date, the average forgiveness amount is $67,139. 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 (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.[26]

This potential "selection" into take-up among the relatively high-income borrowers is consistent with recent social science evidence which suggests that "bandwidth-tax" of administrative process is most onerous for those from the least advantaged groups (Mullainathan and Shafir, 2013; Herd and Moynihan, 2018; Mueller and Yannelis, 2021; Finkelstein and Notowidigdo, 2019; Matthews et al., 2022). 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.[27]

[25] This level is a substantial increase from the January 2022 totals where 84,163 borrowers had received $6.13 billion in relief.

[26] 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, Stinebrickner and Sulemanoglu, 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.

[27] 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 ("Public Service Loan Forgiveness", 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.

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 of 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 3, with the first two columns repeating the earlier results (Figure 2) which show the baseline distribution of immediate PSLF relief without selection into take-up.

Starting with selection into take-up that favors those with graduate education, the second set of columns illustrate 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 pro-actively promoting the program with members.[28] 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 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.

6. 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,

[28] 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.

Romero and Turner, 2022). Yet, 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. And, while 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 limited.

One issue unique to recent years is that the continuation of the student loan repayment pause, combined with the promise of broad-based forgiveness by executive action, may be a hindrance rather than a help to efforts to increase take-up.[29] Choice related to student loan repayment may be less salient to borrowers during the period of the payment pause (commencing in March 2020 and continuing into 2023). With more than two years without loan payments, eligible borrowers may have deferred actions needed to file the PSLF waiver or make associated changes like loan consolidation or a shift in repayment plans. What is more, borrowers who believe that loan forgiveness from executive action will wipe out all or most of their student loan debt may choose to avoid the more administratively cumbersome PSLF application. Behavioral biases of "time inconsistency" and "loss aversion" may further attenuate take-up.[30]

While there have been some efforts to notify those with student loans of potential eligibility for PSLF and the particular opportunities 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

[29] Briones, Powell, and Turner (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.

[30] "Time Inconsistency", which defines the reluctance to commit to activities that require present sacrifice in pursuit of future returns (O'Donoghue and 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 and Tversky, 2000), likely deter take-up of the PSLF waiver among many borrowers.

announcements from the White House.[31] 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, Long, Oreopoulos, Sanbonmatsu, 2012; Finkelstein and 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) involves 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). Greater automation of the processes of Federal Student Aid and the contracted loan servicers could alleviate some administrative burden. 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.

[31] 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.

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 is likely well over $100 billion at stake for as many as four 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 would be teachers, firefighters, police officers and social workers, while increased take-up would also go some distance to reducing the racial gap in student debt. It is important to emphasize that the results presented focus exclusively on those eligible for immediate relief; it is likely that a much larger population would benefit from the potential for 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 and 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 has been on "retroactive adjustments" for administrative shortfalls in the original implementation of the program; left unaddressed are the substantial design flaws in the PSLF program and federal student lending more generally.

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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 earnings	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: Earnings 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	

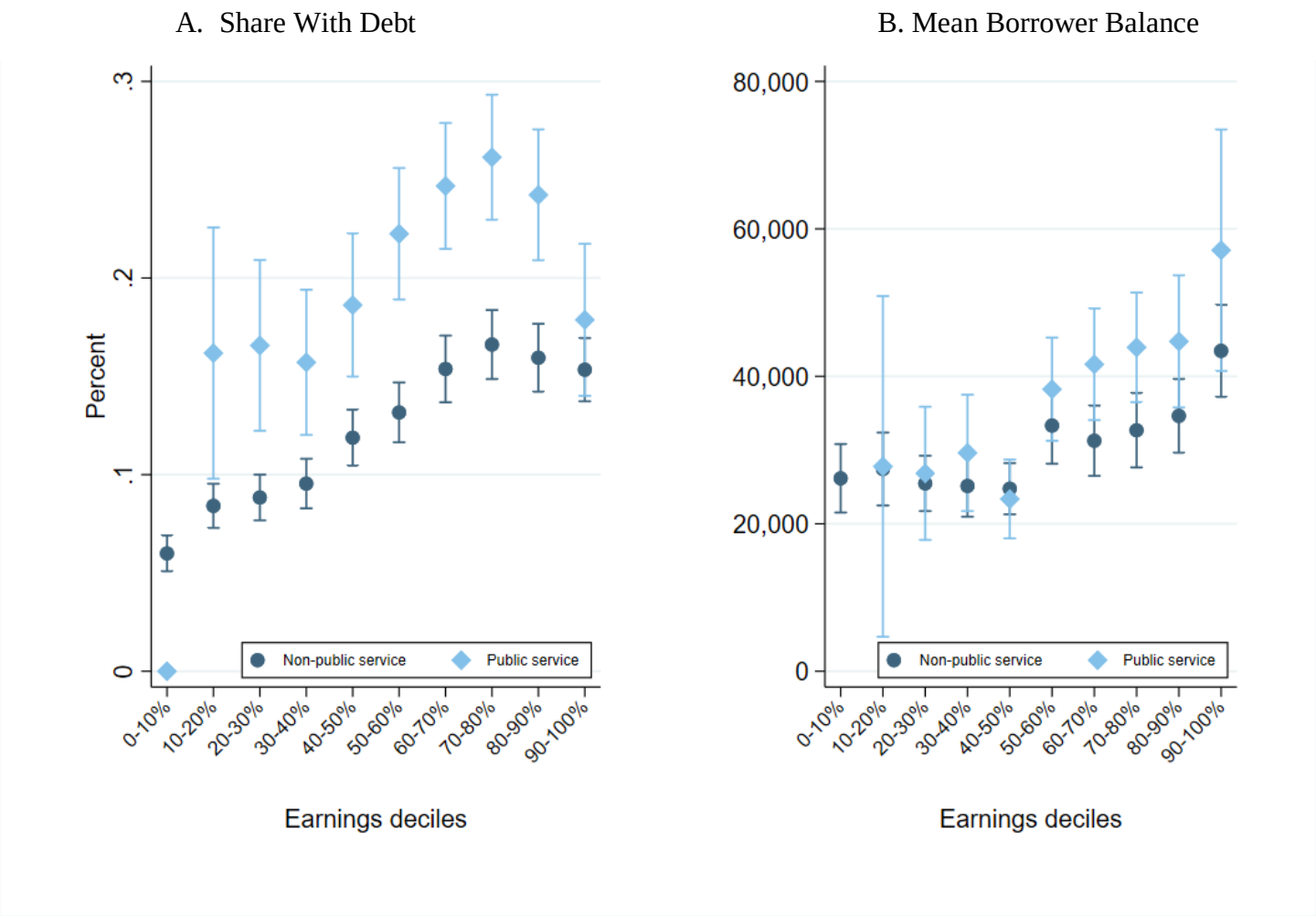
Notes: This table provides the within group share with debt (columns 1 and 3) and debt balances conditional on having debt (columns 2 and 4) for individuals ages 22-60, not enrolled in college during 2017, and with at least some college experience. Columns 1 and 2 show within group shares and balances 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. Distributional Implications of PSLF by Take-up Scenario, SIPP (2018)

	Full		By Education		By Earnings		By Education-Earnings		By Occupation	
	(1)		(2)		(3)		(4)		(5)	
	% Indiv	% PSLF $	% Indiv	% PSLF $	% Indiv	% PSLF $	% Indiv	% PSLF $	% Indiv	% 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: Earnings 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), earnings (column 3), joint education and earnings (column 4), and occupation (column 5). "% Indiv" 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 Section 5 of the main text for additional details. Within a panel, percentages may not add up to one due to rounding.

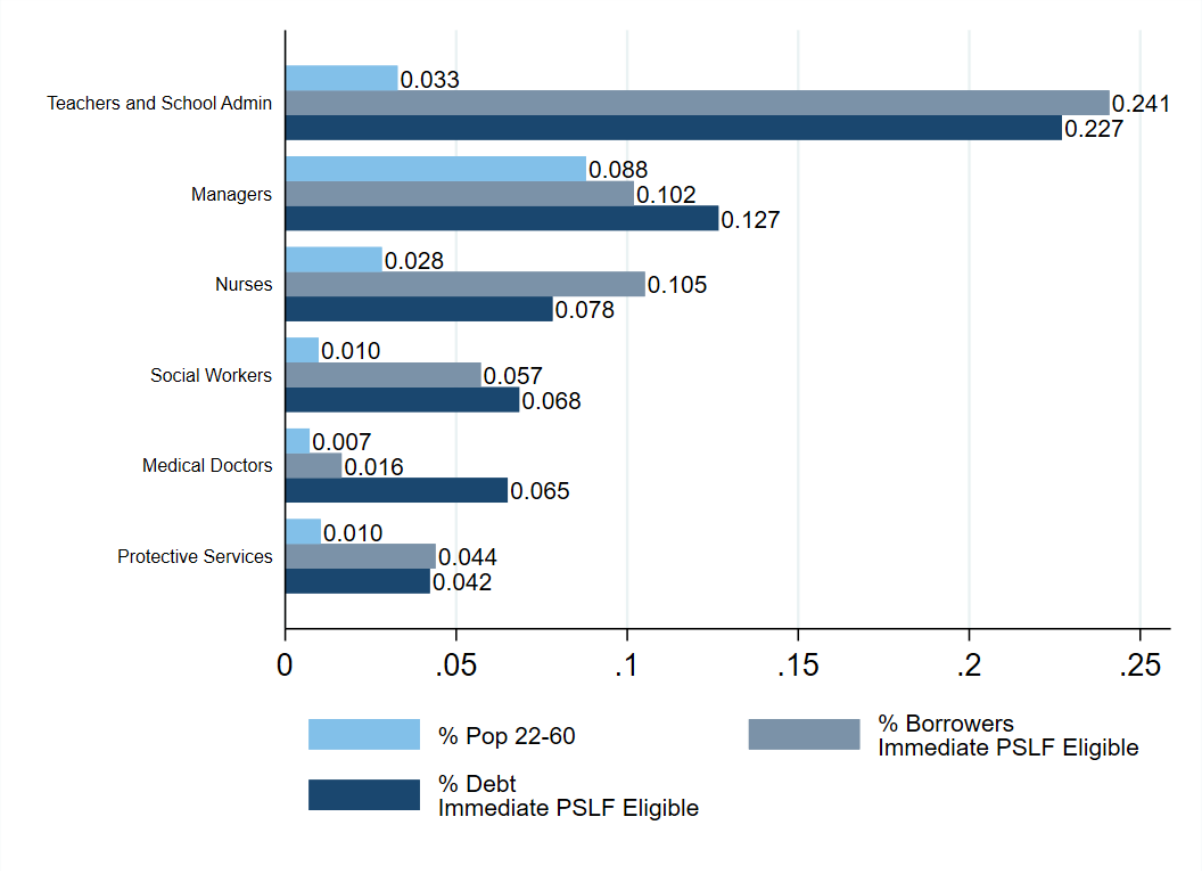
Figure 1. Distribution of Student Borrowing and Student Debt, Public Sector, SIPP (2018)



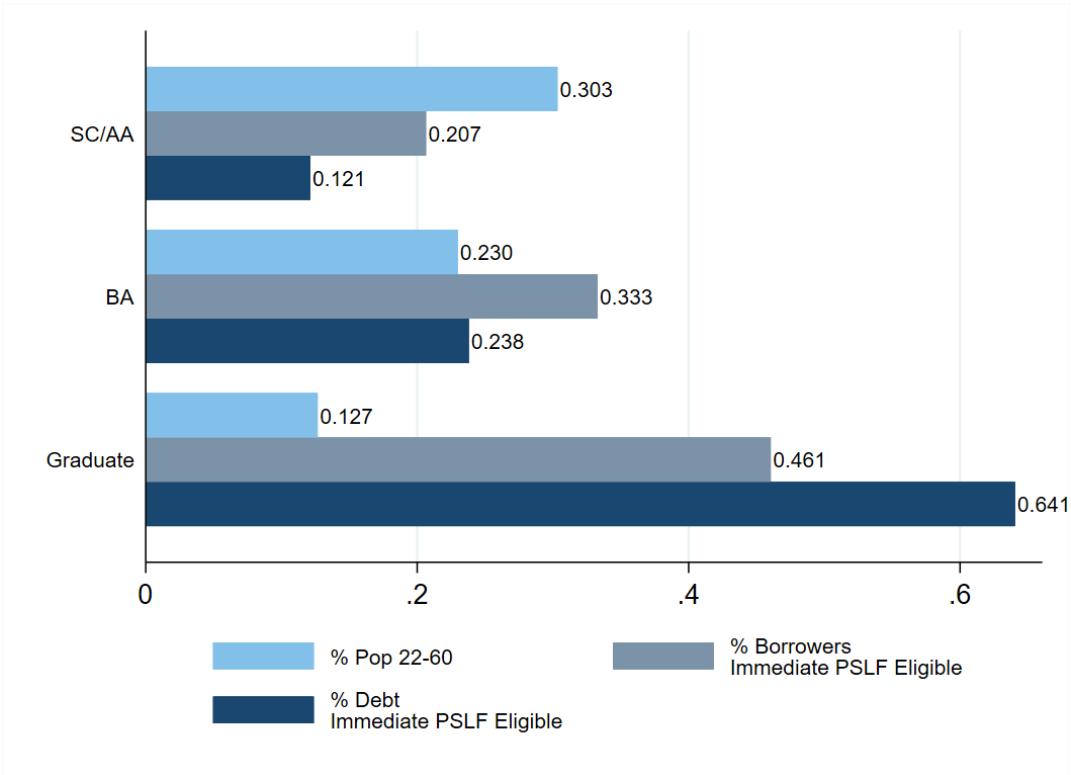
Notes: This figure displays the share of individuals with student debt (panel A) and the mean per capita student loan balance of borrowers (panel B) by cohort earnings decile and sector of primary employment. The sample includes individuals ages 22 to 60 with at least some college experience. Public 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-earnings deciles can be found in Appendix Table A.1. 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.

Figure 2. Proportion of Immediate PSLF Eligible Employees and Debt Across Subgroup, SIPP (2018)

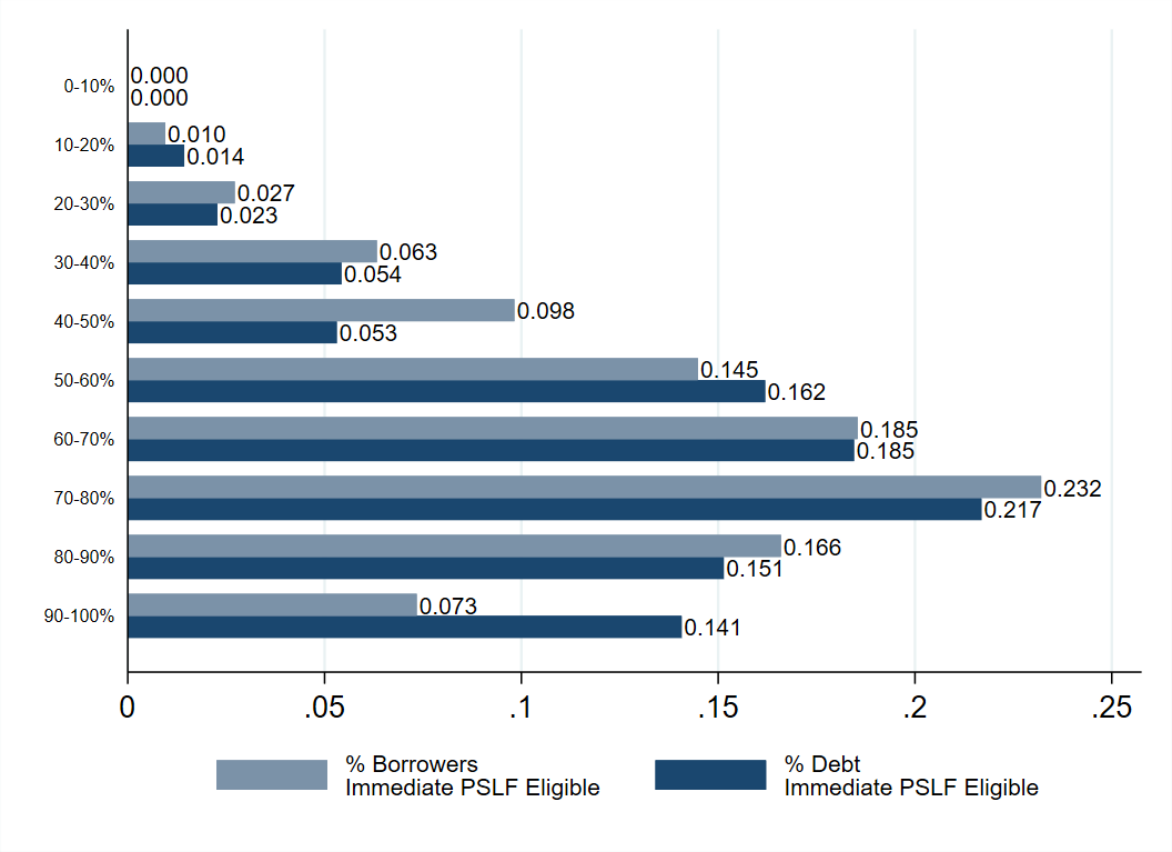
Panel A. Public Service Occupations with Largest Aggregate Immediate PSLF Eligible Debt



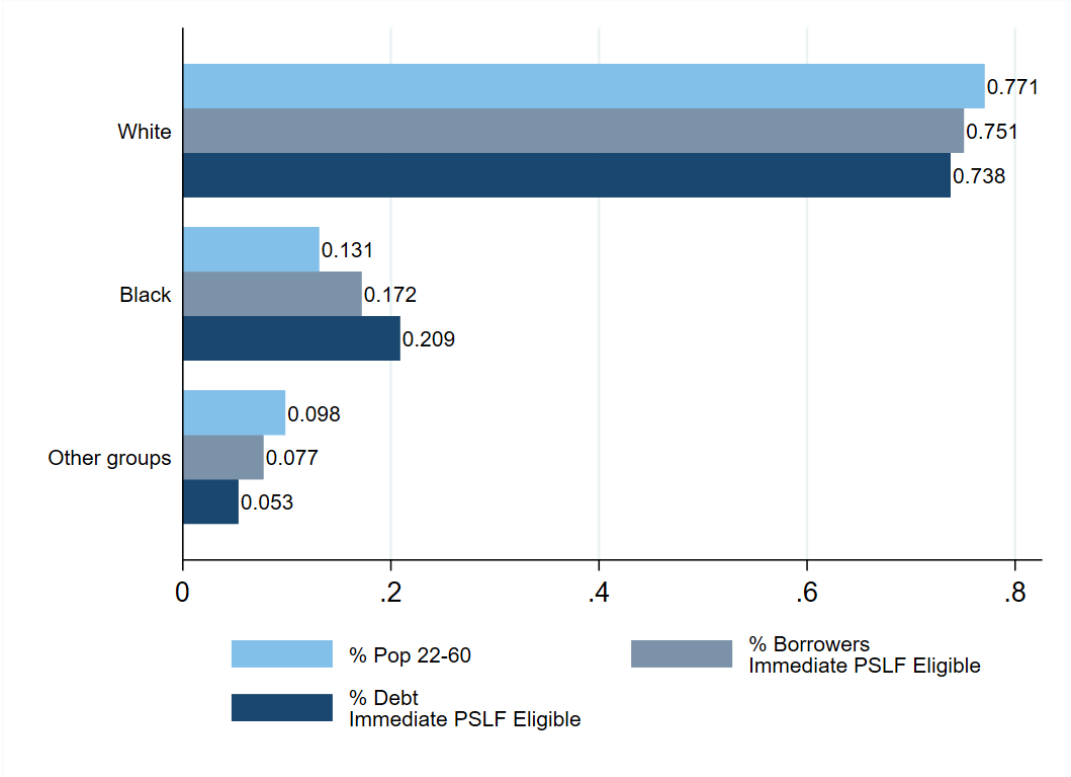
Panel B. Education



Panel C. Earnings Decile



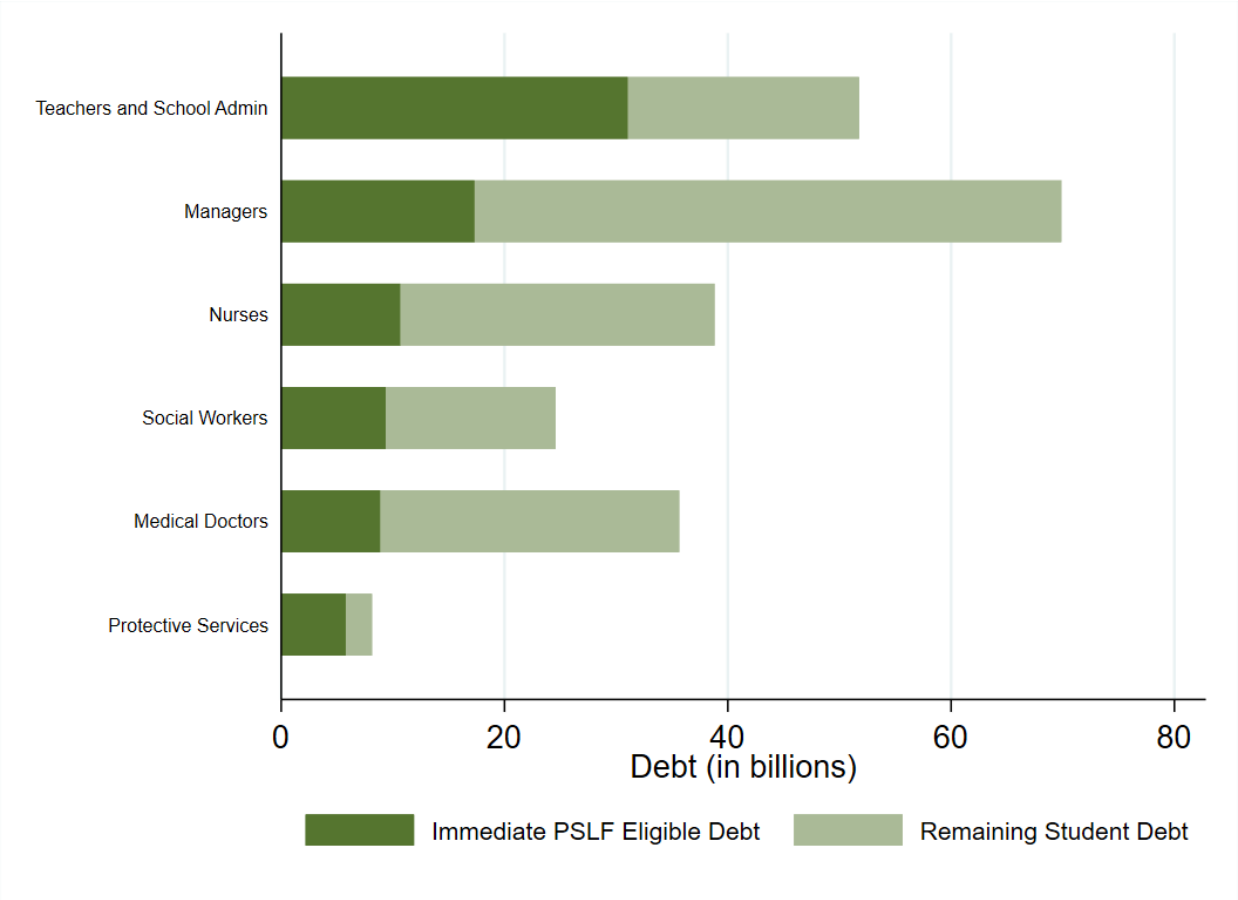
Panel D. Race



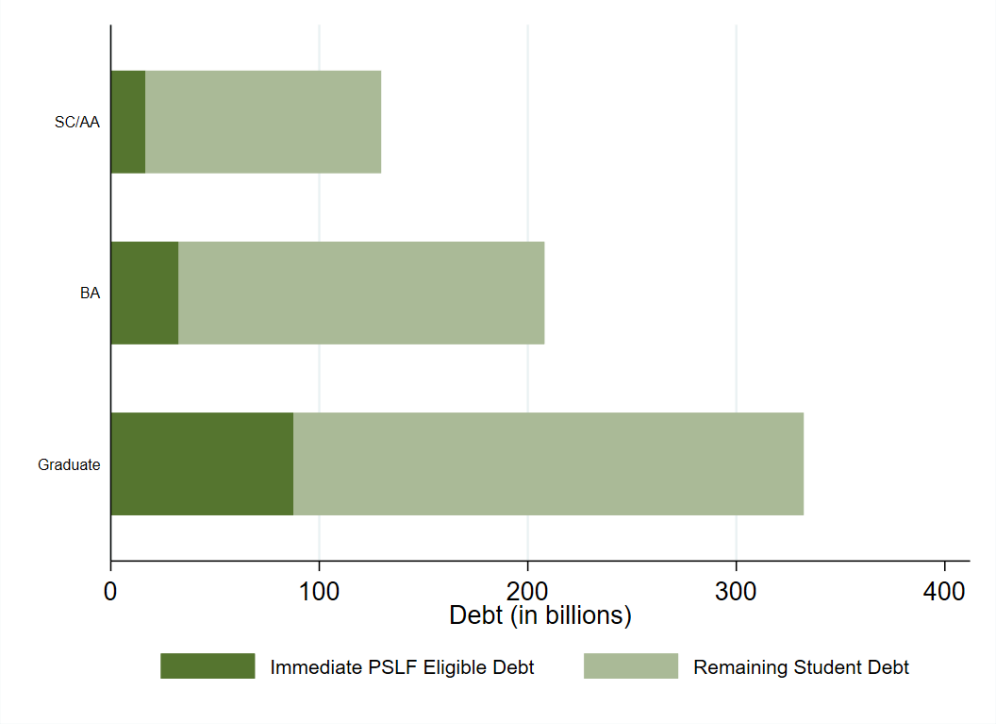
Notes: These figures illustrate the proportion immediate PSLF eligible employees and debt across occupation (panel A), educational attainment (Panel B), earnings (panel C), and race (Panel D). Estimates are conditional on being part of the immediate PSLF eligible group. Variable definitions follow our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

Figure 3. Total Student Debt and Immediate PSLF Eligible Debt Within Subgroup, SIPP (2018)

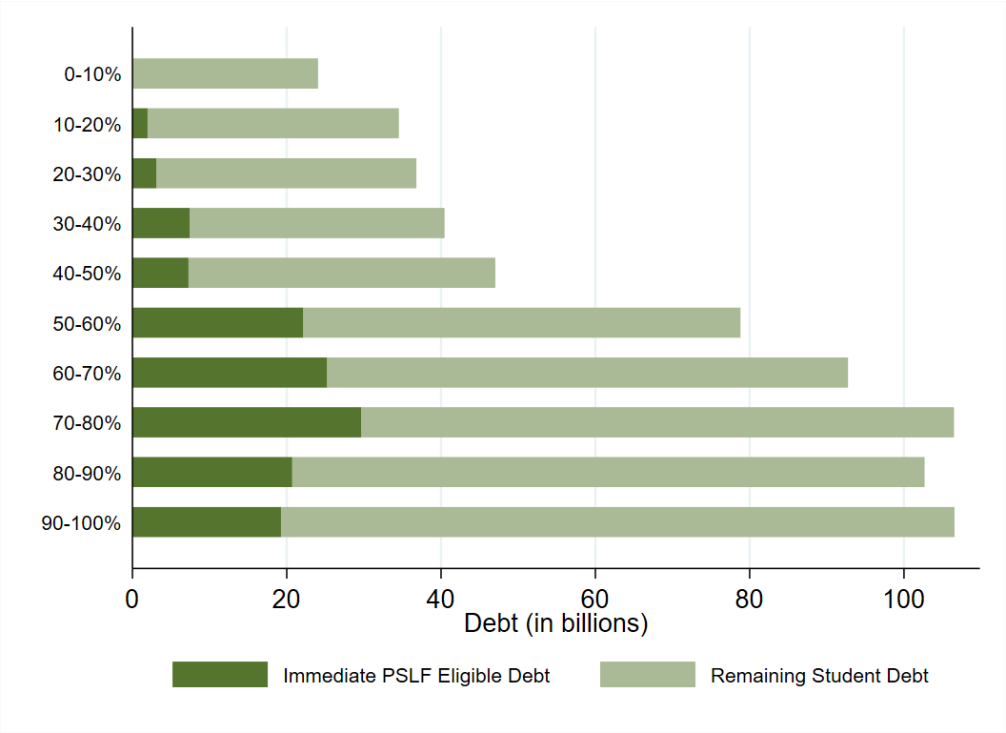
Panel A. Public Service Occupations with Largest Aggregate Immediate PSLF Eligible Debt



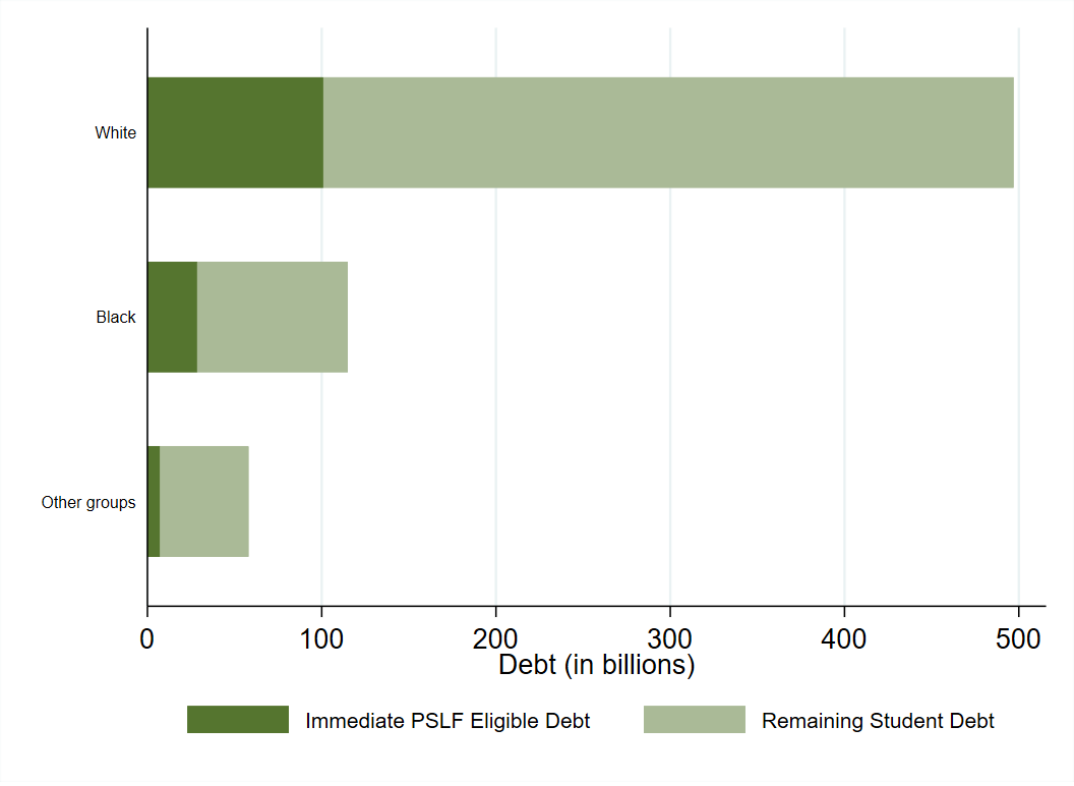
Panel B. Education



Panel C. Earnings Decile



Panel D. Race



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

Appendix A. Additional Tables and Figures

Table A1. Earnings Decile Cutoffs

	Earnings Decile									
	1	2	3	4	5	6	7	8	9	10
Overall	24	9,036	18,138	26,016	34,188	44,220	57,060	75,794	112,392	2,752,848
Age										
22-25	0	4,016	10,428	16,644	21,177	26,076	31,510	38,674	53,772	491,475
26-30	0	8,160	17,144	23,628	29,847	36,552	45,515	56,440	78,216	1,103,436
31-35	24	9,645	19,812	27,877	36,139	45,908	57,264	73,200	104,244	964,728
36-40	12	9,422	19,698	28,376	38,820	49,215	61,561	81,839	115,766	981,668
41-45	204	11,055	21,098	30,105	39,269	51,624	65,298	89,100	130,006	2,216,884
46-50	156	10,408	20,856	30,084	39,208	50,572	65,236	89,250	125,955	2,545,392
51-55	48	9,353	18,252	26,973	37,468	48,855	63,912	85,260	130,428	2,752,848
56-60	36	8,820	16,440	24,868	33,888	45,505	60,036	80,916	126,324	1,169,796

Notes: This table shows the highest level of annual earnings by age group and earnings decile. Age-specific earnings deciles are calculated using all individuals regardless of educational attainment, working status, or borrowing status within the specified age range that are not currently enrolled in school and are weighted using the SIPP December final person weights. The "overall" group follows the same calculation method but does not condition on age. Annual earnings are calculated by summing total personal income across months for each individual and includes earnings from all profits/losses from jobs, investment/property, means-tested transfers, social insurance payments, and other reported income. Negative monthly total income values are set to zero. All monetary variables are in terms of 2017 dollars.

Source: Authors' calculations from the first wave of the 2018 Survey of Income and Program Participation (SIPP).

Table A2. Alternative Immediate PSLF Eligible Sample Definitions and Estimates of Distributional Implications, SIPP (2018)

	Potential Experience		Potential Experience + Full-Time		Pre-2017 Experience		Pre-2017 Experience + Full-Time	
	(1)		(2)		(3)		(4)	
	% Indiv	% PSLF $	% Indiv	% PSLF $	% Indiv	% PSLF $	% Indiv	% PSLF $
Panel A: Race								
White	0.747	0.738	0.751	0.738	0.737	0.745	0.747	0.750
Black	0.171	0.205	0.172	0.209	0.188	0.199	0.187	0.201
Other groups	0.082	0.056	0.077	0.053	0.075	0.057	0.066	0.050
Panel B: Education								
SC/AA	0.213	0.124	0.207	0.121	0.206	0.177	0.207	0.174
BA	0.341	0.251	0.333	0.238	0.269	0.206	0.260	0.202
Graduate	0.446	0.625	0.461	0.641	0.525	0.617	0.533	0.623
Panel C: Earnings Decile								
0-10%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10-20%	0.021	0.020	0.010	0.014	0.015	0.013	0.013	0.009
20-30%	0.044	0.035	0.027	0.023	0.018	0.011	0.010	0.007
30-40%	0.064	0.054	0.063	0.054	0.029	0.018	0.030	0.019
40-50%	0.096	0.054	0.098	0.053	0.096	0.066	0.097	0.066
50-60%	0.143	0.159	0.145	0.162	0.124	0.167	0.122	0.167
60-70%	0.180	0.183	0.185	0.185	0.196	0.221	0.198	0.220
70-80%	0.219	0.207	0.232	0.217	0.224	0.189	0.225	0.189
80-90%	0.162	0.153	0.166	0.151	0.225	0.201	0.235	0.207
90-100%	0.071	0.135	0.073	0.141	0.072	0.113	0.071	0.116
Panel D: Occupation								
Manager	0.100	0.124	0.102	0.127	0.102	0.113	0.106	0.116
Social worker	0.057	0.070	0.057	0.068	0.051	0.037	0.054	0.038
Teacher and school admin	0.235	0.222	0.241	0.227	0.339	0.323	0.350	0.330
Medical doctor	0.017	0.065	0.016	0.065	0.004	0.026	0.004	0.027
Protective services	0.041	0.040	0.044	0.042	0.048	0.078	0.050	0.081
Nurse	0.107	0.081	0.105	0.078	0.085	0.072	0.080	0.070

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. "% Indiv" 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.

Appendix B. Data and Sample Construction

In our analysis, we use the first wave of the 2018 Survey of Income and Program Participation (SIPP). Data files cover January through December 2017 and can be found here. We restrict our main sample of analysis to those age 22 to 60 and who were never enrolled in school during 2017. We further restrict borrowers to having at least some college experience and report a student debt balance greater than zero. In Table B.1, we provide descriptions for the main variables used in the analysis. In Table B.2, we benchmark the aggregate student loan borrower and balances from the SIPP to reported data from Federal Student Aid (FSA).

Table B1. Primary Variable Descriptions, SIPP (2018)

Name	Description
Annual earnings	The sum of all personal monthly earnings and income. A month's earnings are set to zero when negative income is reported prior to calculating the sum of earnings. SIPP variable name: TPTOTINC
Primary occupation	An individual's listed job held for the most months with non-zero working hours. For individuals who were in their reported job prior to January 2017, we observe what year they started their job. In these cases, we assume the individual worked for 12 months of each year from their reported start year and add the additional months worked in a job in 2017. Individuals without a job for most of 2017 are coded as unemployed. Individuals who report having a job and unemployed for an equal total of months, are coded as employed. SIPP variable names: TJB*_OCC, TJB*_STRTYR[32]
Full-time worker	An employed individual who works, on average, at least 30 hours a week in their primary occupation in 2017 for at least 2/3 of the total number of months worked in that job in 2017. We use 30 hours per Federal Student Aid's qualification of "full-time" for PSLF eligibility. We use 2/3 of working months to account for some occupations where zero working hour months for a portion of the year may be common (e.g., teachers).[33] SIPP variable name: TJB*_MWKHRS
Control of employer/Sector of employment	Class of worker according to primary job held in the most months in 2017 (see primary occupation definition). We collapse class categories as follows: 1. Government: Federal, state, and local government employees including active-duty military. 2. Private/Self-employed: Employees of private, for-profit companies and those who are self-employed. 3. Not-for-profit: Employees of private, not-for-profit companies SIPP variable name: EJB*_CLWRK
Job tenure	Length of time working in primary occupation, measured in months. Note we only observe job tenure for an individual's occupation(s) held within 2017. We can roughly measure pre-2017 tenure, for those who started their reported job prior to 2017 (see primary occupation definition). SIPP variable names: TJB*_OCC, TJB*_STRTYR
Potential experience	Assigned according to standard Mincer approach where potential experience = age – years of education – 6. Years of education are assigned as follows: 1. High school or less = 12 2. Some college, certificate, or associate's = 14 3. Bachelor's = 16 4. Graduate degree = 18 For some young degree earners, potential experience is negative following the above equation. In these cases, potential experience is set to zero. Potential experience is also set to zero for those who we code as unemployed. SIPP variables names: TAGE, EEDUC, ECERT

[32] Symbol "*" within a variable name refers to all number versions of the variable found in the SIPP.
[33] See, for example, FSA guidance on PSLF qualification for teachers that do not teach over the summer break.

Table B1 (Continued)

Educational attainment	Highest level of school or highest degree received by December 2017 and grouped as follows: 1. HS or less: High school graduates and below 2. SC/AA: Those with at least some college credit, but at most, an associate's degree 3. BA: Those with a bachelor's degree 4. Graduate: Those with a master's, professional school (e.g., JD), or doctorate degree We code those who report having less than some college experience but also reporting having earned an educational certificate at a college, university, community college, or trade school as "SC/AA." SIPP variable names: ECERT, EEDUC
Student loan balance	Amount of student loans or educational expenses owed in own name only as of the last day of 2017. SIPP variable name: TOEDDEBTVAL
Student loan borrower	An individual who reports having owed any money for student loans or educational-related expenses in their own name during 2017 and report having a student debt balance greater than zero. We restrict borrowers to having at least some college experience. SIPP variable name: EOEDDEBT, TOEDDEBTVAL
Immediately PSLF eligible: Potential experience approach	Those individuals 1. whose sector of employment associated with their primary occupation is government or not-for-profit, 2. have at least 10 years of potential experience, 3. have at least some college experience, 4. report having student loan debt, 5. and have a non-missing, non-zero value for their student loan debt balance.
Immediately PSLF eligible: Potential experience + full-time approach	Those individuals 1. whose sector of employment associated with their primary occupation is government or not-for-profit, 2. have at least 10 years of potential experience, 3. have at least some college experience, 4. report having student loan debt, 5. have a non-missing, non-zero value for their student loan debt balance, 6. and work full-time in the primary occupation
Immediately PSLF eligible: Pre-2017 experience	Those individuals 1. whose sector of employment associated with their primary occupation is government or not-for-profit, 2. have at least 120 months of job tenure in their primary occupation, 3. have at least some college experience, 4. report having student loan debt, 1. have a non-missing, non-zero value for their student loan debt balance,
Immediately PSLF eligible: Pre-2017 experience + full-time approach	Those individuals 2. whose sector of employment associated with their primary occupation is government or not-for-profit, 3. have at least 120 months of job tenure in their primary occupation, 4. work full-time in their primary occupation, 5. have at least some college experience, 6. report having student loan debt, have a non-missing, non-zero value for their student loan debt balance,

Notes: This table describes the main variables used in the analysis. All variables come from the first wave of the 2018 Survey of Income and Program Participation (SIPP). Actual variable labels are included in the description.

Table B2. Benchmark Aggregate Student Loan Borrower Counts and Balances

	Federal Student Aid (2017)	SIPP (2018)	Main Sample
Panel A. Aggregate			
Borrowers (in millions)[34]	42.6	35.9	21.5
Total Debt (in billions)	($1,366.9)	($1,017.2)	($669.9)

	Federal Student Aid	SIPP (2018)
Panel B. Age		
24 and younger	8.7 ($130.3)	6.5 ($119.7)
25 to 34	15.3 ($484.0)	12.5 ($381.8)
35 to 49	13.7 ($502.2)	11.0 ($354.2)
50 to 61	5.7 ($199.8)	4.5 ($135.0)
62 and older	1.7 ($55.4)	1.3 ($26.5)
Panel C. Debt Size		
Less than 5k	8.6 ($22.4)	8.5 ($11.4)
5k to 10k	7.7 ($56.9)	4.9 ($33.4)
10k to 20k	9.4 ($135.8)	7.0 (95.2)
20k to 40k	9.4 ($268.3)	7.3 (193.7)
40k to 60k	4.0 ($195.1)	3.4 (156.3)
60k to 80k	2.3 ($160.3)	1.9 (125.1)
80k to 100k	1.1 ($98.2)	0.9 (80.2)
100k to 200k	1.9 ($258.9)	1.1 (135.3)
200k+	0.6 ($176.0)	0.9 (186.6)

Notes: This table displays the aggregate student loan borrower counts and balances from Federal Student Aid (FSA) and the 2018 SIPP. Panels B and C compare the data sources across age and debt size group, respectively. FSA figures come from the federal student loan portfolio summaries. Borrowers are listed (in millions) and the associated debt total (in billions) is listed in parentheses. We report the 2017 Q4 balances to align with the 2017 reference period for the first wave of the 2018 SIPP. "SIPP (2018)" and "Main Sample" columns report weighted sums using the SIPP December final person weights. "SIPP (2018)" refers to all individuals in the SIPP. "Main Sample" refers to our analytical sample where we keep individuals ages 22 to 60 and who are not currently enrolled in school. In our main sample, only, we do not include those who have a high school diploma or less and report holding student debt in our sample of borrowers because the source of these debt balances is unclear.

[34] In the SIPP, we observe some individuals who report holding student debt, but also report holding a zero balance. For the purposes of this benchmark exercise, we include these borrowers that report a zero student debt balance. In our main analysis, we require that borrowers have a positive student debt balance.

As we show in Table B.2, the SIPP undercounts student loan borrower counts and balances relative to FSA in the aggregate, and in general across age groups and debt sizes. Further, our main sample of analysis represents approximately 60 percent of the borrowers and 66 percent of the total debt reported in the SIPP. Several sample restrictions yield this result (all reported estimates below are weighted sums using the SIPP December final person weights):

1. *Never enrolled in school in 2017*: Approximately 10.5 million borrowers (about a third of all borrowers in the SIPP) report having attended school in 2017 and collectively hold about $280.1 billion in student debt.
2. *Ages 22 – 60*: Approximately 4.6 million borrowers are below the age of 22 or above the 60 and this group holds about $78.8 billion in student debt. There about 1.8 million borrowers holding $33.4 billion who are outside this age range and who were not enrolled in school in 2017.
3. *Borrowers must report having at least some college experience*: We observe approximately 3.1 million borrowers holding $47.6 billion in student debt that also report having no college experience. Because the source of these loans is particularly unclear, we do not include this group in our defined subsample of "borrowers" (see Table B.1). Those without college experience, not enrolled in school, and between ages 22 to 60 represent about 2.1 million borrowers and $33.8 billion in the reported student debt in the SIPP.

Sample restriction (1) and (2), as defined above, follow Catherine and Yannelis (2021) who utilize the 2019 Survey of Consumer Finances (SCF). Like the SIPP, the 2019 SCF undercounts the aggregate student debt relative to FSA. In fact, Catherine and Yannelis (2021) report 1.2 trillion in total debt whereas the reported total from FSA in Q4 of 2019 was 1.5 trillion. Moreover, we similarly find that approximately one-third of the aggregate debt is held by individuals still in school.[35]

[35] Catherine and Yannelis (2021) do not report aggregate borrower counts for comparison.

Appendix C. Additional Details on Public Service Loan Forgiveness (PSLF)

See Powell and Turner (2022). "Public Service Loan Forgiveness Waivers: A Time-Limited Opportunity for Debt Relief"

Four primary challenges are addressed with the waivers; these concern the type of loans held by individuals, the type of repayment program, the treatment of forbearance, and the periods of employment counting for forgiveness. What is significant about these changes is that they apply retroactively, though they do require an application.

- **Expanding eligibility to prior payments on non-Direct Loans:** The 2007 PSLF authorizing language restricts qualifying payments to those on Federal Direct Loans. Prior to 2010 when the federal government ended guaranteed lending and shifted to full direct lending, most borrowers received Federal Family Education Loans (FFEL), government guaranteed loans from private lenders. By statute, borrowers with non-Direct loans could gain access to PSLF by consolidating them into Direct Consolidation loans; however, any payments made prior to loan consolidation did not count towards PSLF. Basic confusion among borrowers was often exacerbated by the failure of loan servicers to inform borrowers that their loans were ineligible for PSLF or pre-consolidation payments were ineligible. Under the PSLF waiver announced in October 2021 by the Department of Education, *borrowers could retroactively receive credit prior periods of repayment on other loans paid before consolidation*, though borrowers still needed to complete a consolidation to a Direct Loan before forgiveness under PSLF.
- **Credit to Repayment Counts paid under Ineligible Payment Plan:** In addition to eligible payments being limited to those on Direct Loans, borrowers must repay their loans under an income-driven repayment plan or standard 10-year plan for their payments to qualify for PSLF traditionally. Borrowers faced informational barriers from servicers as well as bureaucratic difficulties in re-enrolling in income-driven repayment plans. 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. Recognizing these problems, *borrowers may now receive retroactive credit on payment periods under the wrong repayment plan* under the current waiver.
- **Credit to Repayment Counts for Forbearance and Deferment Periods**: 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. This led borrowers to choose a pause on loan payments – which do not count towards any forgiveness and in some cases, can lead to higher loan balances due to interest accrual – rather than income-driven plans that allow progression towards loan forgiveness. *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.*
- **Flexibility for Previously Non-Eligible Payments and Borrowers:** The waiver also addresses three particular circumstances that had previously rendered borrowers or payments ineligible for PSLF. Borrowers may now retroactively count periods of payment in which they were pursuing Teacher Loan Forgiveness or when payments were late or less than the amount due; furthermore, borrowers who completed 120 payments with a qualifying employer but are not *employed* with a qualifying employer at the time of their application and forgiveness may receive PSLF.

Figure C1. Timeline of PSLF policy adjustments