

U.S. Department of Education
Trends in Federal Student Loans for
Graduate School



Office of the Chief Economist
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From July 2021 to June 2022, the U.S. Department of Education (Department) disbursed \$39 billion dollars in federal student loans to graduate students and \$44 billion to undergraduate students and their parents. At 47 percent, this set a high-water mark for the highest share of federal student loan disbursements going to graduate students in history, even though graduate borrowers accounted for only 21 percent of all borrowers.

The increases in graduate degree attainment fueled by this borrowing both drive and reflect new economic opportunities. Advanced degree attainment often opens doors to new and more lucrative career paths and, on average, the individuals with graduate degrees tend to earn substantially more than graduates who have only a bachelor's degree. At the same time, the gradual erosion of barriers to entry into these careers has led to large increases in enrollment in the graduate programs preparing students for those careers, especially for women whose rise in graduate attainment has been most pronounced.

A closer look at borrowing trends and the outcomes of graduate programs, however, suggest cause for concern. Unlike undergraduate students, graduate students have been able to borrow up to the cost of attendance of their program of study since 2007. The change has led to increases in total borrowing among graduates, and large increases in the fraction of borrowers completing their studies with extremely high balances. This rise in borrowing occurred against a backdrop of high but stagnant earnings premia for graduate degrees over the past 20 years, suggesting a potential decline in the net return to graduate credentials (though the picture is complicated as programs like Public Service Loan Forgiveness and Income Driven Repayment plans influence expected loan repayments for some borrowers). More importantly, in many graduate programs and across public, private nonprofit, and private for-profit institutions, too many borrowers graduate with debt levels that are too high relative to their early career earnings. There is generally very little correspondence between the amount students borrow to finance their advanced degrees and their labor market outcomes.

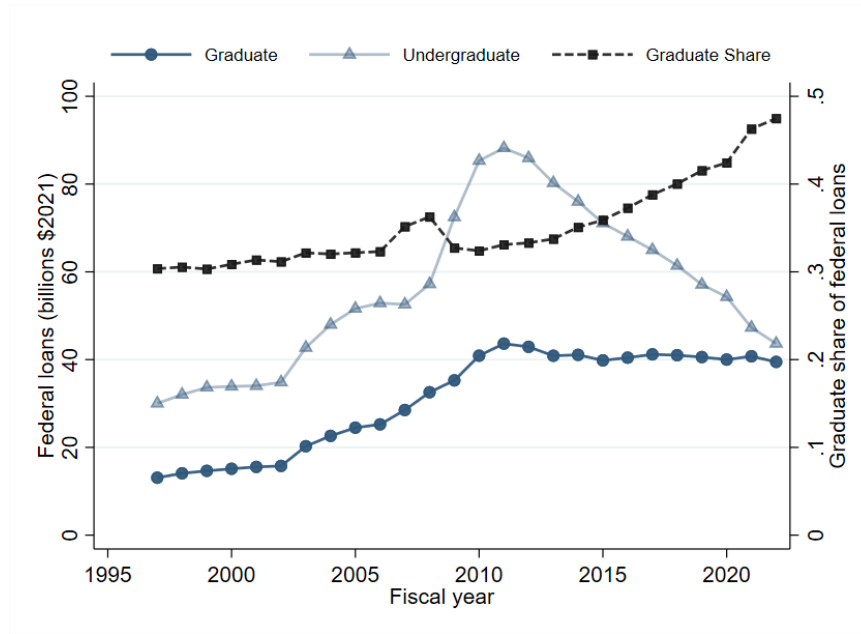
This data brief provides an overview of trends in graduate borrowing over the past several decades. We start with an overview of trends in overall graduate borrowing relative to that of undergraduates, and then document the changes in graduate education attainment that partially drive these changes. After presenting evidence on broad trends in the earnings premia enjoyed by advanced degree holders, we present analyses of the relationship between debt and earnings outcomes across about 5,300 graduate programs based on new data recently published by the Department.

If Recent Trends Continue, Graduate Loans Will Soon Comprise the Majority of Federal Student Loan Disbursements.

After a steep rise over the early 2000s and an explosion in the Great Recession, average undergraduate loan volume has declined steadily, mirroring a fall in enrollment particularly pronounced among community colleges and for-profit institutions. Total undergraduate disbursements were nearly \$80 billion in 2010, and by 2021 they had fallen to \$45 billion (all dollar figures in 2020 dollars). Over the same

period, graduate federal student loan disbursements grew sharply from 1996 to 2011, but largely held steady at about \$40 billion annually for the following decade. If these trends continue, graduate loan disbursements may exceed undergraduate disbursements in the next few years.

Figure 1: Total Federal Student Loan Volume, by Academic Level: 1996 to 2022

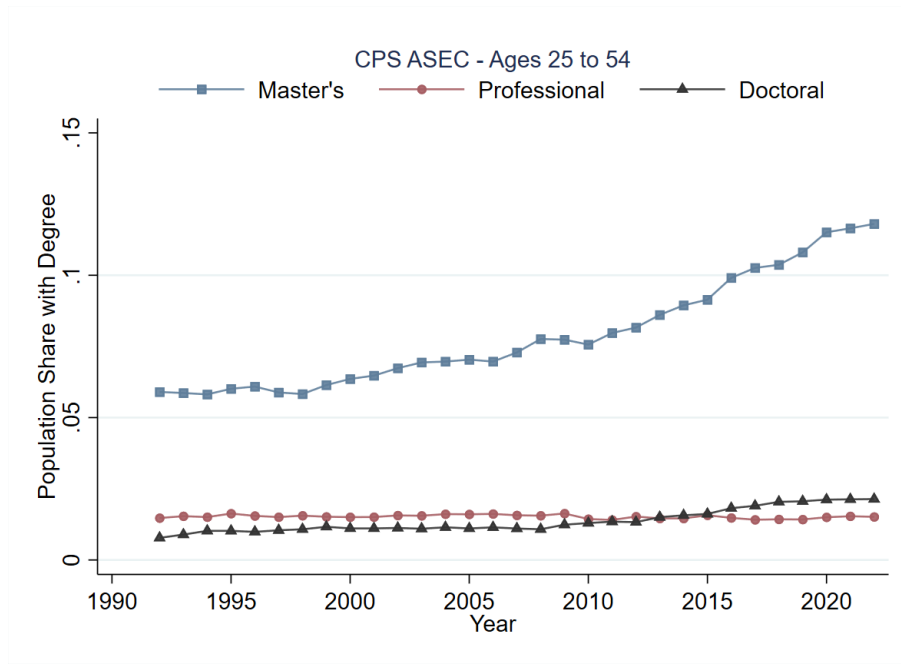


Source: U.S. Department of Education, Office of Federal Student Aid.

Trends in Graduate Borrowing Reflect Increases in Advanced Degree Attainment Accelerated by the Great Recession

The share of prime-age adults (age 25 to 54) holding graduate degrees doubled over the last 20 years. The increase was driven by increases in master’s degree attainment, with the share of adults with that degree rising from 6 percent in 2000 to 12 percent in 2022. Growth in doctoral degree attainment is more muted in absolute terms but very large in relative terms, going from 0.8 to 2.1 percent between 1992 and 2022. Increases in the share of the population with both degrees began growing more rapidly around the onset of the Great Recession in 2008 and the introduction of the PLUS student loan program for graduate and professional students in 2007.

Figure 2: Share of Prime-Age (25-54) Population with a Graduate Degree, by Credential Level: 1993 to 2022

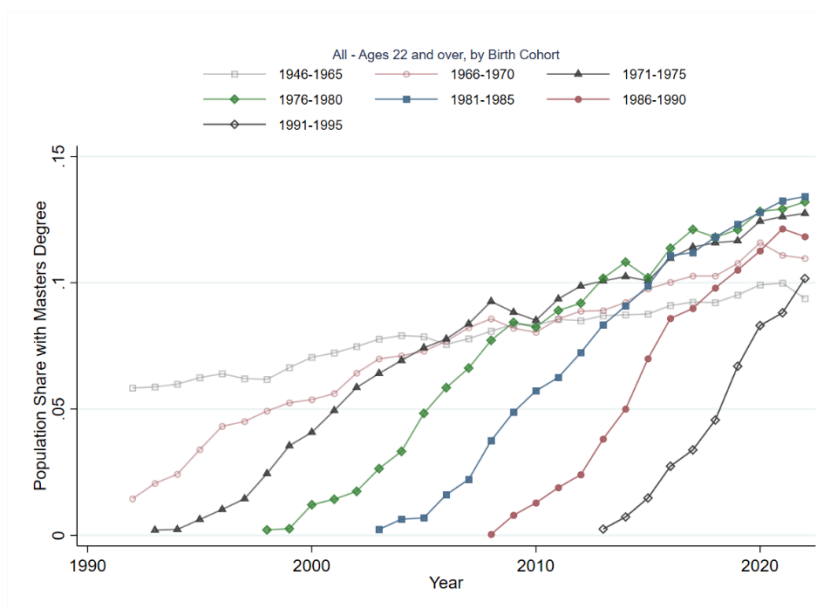


Source: Current Population Survey, Annual Social and Economic Supplement (1993-2022).

Graduate Attainment Has Risen Across Cohorts

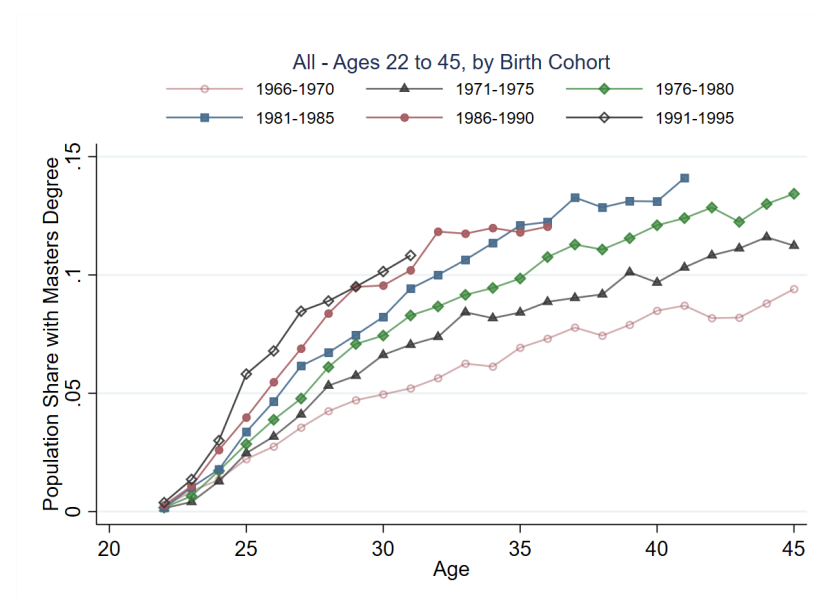
Figure 3.1 disaggregates the national trend in master’s degree attainment across different birth cohorts. For example, the share of individuals born between 1971 and 1975 with a master’s degree in each year is shown with the line indicated by black triangles, starting when the oldest cohort members (i.e., those born in 1971) are age 22 (in 1992), and following their master’s degree attainment through 2021 when the oldest cohort members are 51. Starting with the birth cohorts from 1946 to 1965, note that their attainment of master’s degrees continues rising, albeit gradually, through the end of the period, when the cohort’s youngest members are nearing their sixties. The next birth cohort, born between 1966-1970, appears to converge to the age-educational attainment profile of the older birth cohorts. Starting with cohorts born from 1971 to 1980, however, the share with a master’s degree quickly surpassed older cohorts, particularly around the onset of the Great Recession—when the oldest members of the cohort were in their mid- to late 30s. Subsequent birth cohorts earn master’s degrees even faster (as shown more clearly in Figure 3.2, which shows the share of each birth cohort that has obtained a master’s degree by age), helping to fuel the general rise in master’s credentials seen after 2010.

Figure 3.1: Trend in the Share of Population with a Master's Degree, by Birth Cohort: 1992 to 2022



Source: Current Population Survey, Annual Social and Economic Supplement (1993-2022).

Figure 3.2: Trend in the Share of Population with a Master's Degree, by Age and Birth Cohort



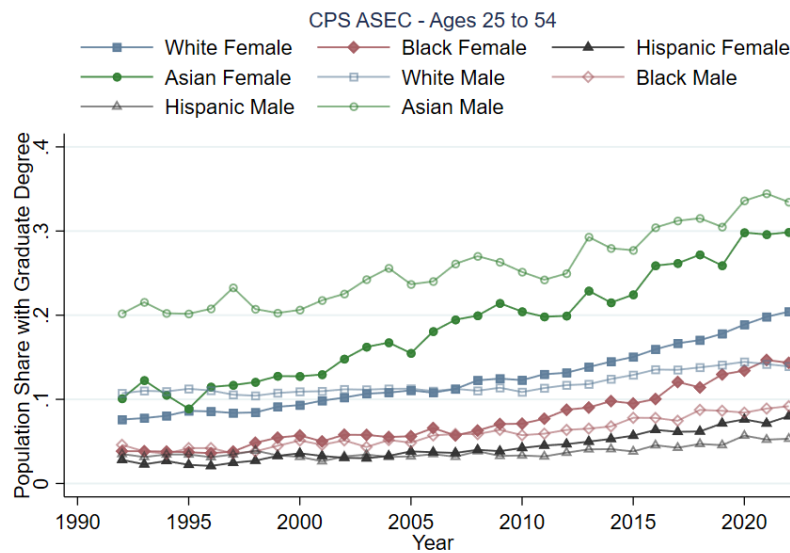
Source: Current Population Survey, Annual Social and Economic Supplement (1993-2022).

Increases in Graduate Degree Attainment Have Been Driven by Women

As shown in Figure 4, women's graduate degree attainment increased over the last 30 years at a much higher pace than men. Interestingly, the divergence in growth rates between men and women's attainment

starts around 2009-2010 for Black and Hispanic¹ women, whereas for Asian and White women the rate of increase in graduate degree attainment exceeds their male counterparts from the start of the time period. Asian women start with similar rates of graduate degree attainment as White men but have roughly twice their share by 2021. At the same time, Black women were one-third as likely as White men to have a graduate degree in 1992 but are more likely to have a graduate degree by 2021.

Figure 4: Trends in Graduate Attainment, by Race and Gender: 1992 to 2022



Source: Current Population Survey, Annual Social and Economic Supplement (1992-2021).

Black Students Disproportionately Attend Graduate Programs at For-Profit Institutions

In 2002, public institutions enrolled well over half of all graduate students (56 percent), private non-profit institutions enrolled 39 percent, and for-profit institutions enrolled about 5 percent. Figure 5 shows that for all race and ethnicity groups, the share of enrollment in different types of institutions changed substantially over the past 20 years. By 2020, the enrollment share of White graduate students declined to 50 percent at public institutions, increased to 40 percent at private non-profit institutions, and nearly doubled to 10 percent at for-profit institutions.

For Black students, the changes in the composition of graduate student enrollment across institutions were even more pronounced. While total Black graduate enrollment increased by 79 percent between 2004-2012, over half of this increase was accounted for by enrollment in for-profit institutions. Figure 5.2 depicts a precipitous decline in public colleges' share of Black graduate students (from about 70 to less than 40 percent between 2001-2015) coupled with large gains in the for-profit sector, where the share of Black graduate enrollment skyrocketed from about 5 percent in 2001 to 30 percent in 2014. Among Hispanic and Asian graduate students (panels 3 and 4), changes in the distribution of enrollment by school control have been relatively muted, mirroring patterns for White graduate enrollment. As noted

¹ The race and ethnicity labels used here and elsewhere in the report use the category labels of the underlying data sources.

below, these trends are significant since debt and earnings outcomes can and do differ substantially across sectors and can thus contribute to disparities in borrower outcomes by race and ethnicity.

Figure 5: Graduate Student Enrollment by Institutional Control and Student Race/Ethnicity

Figure 5.1: Distribution of White Graduate Students

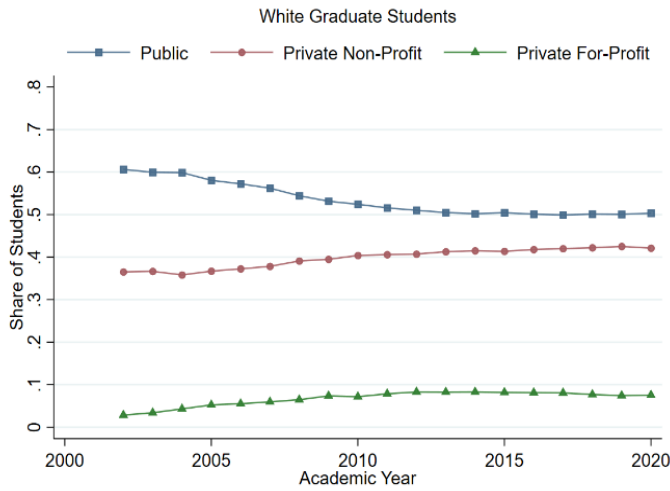


Figure 5.2: Distribution of Black Graduate Students

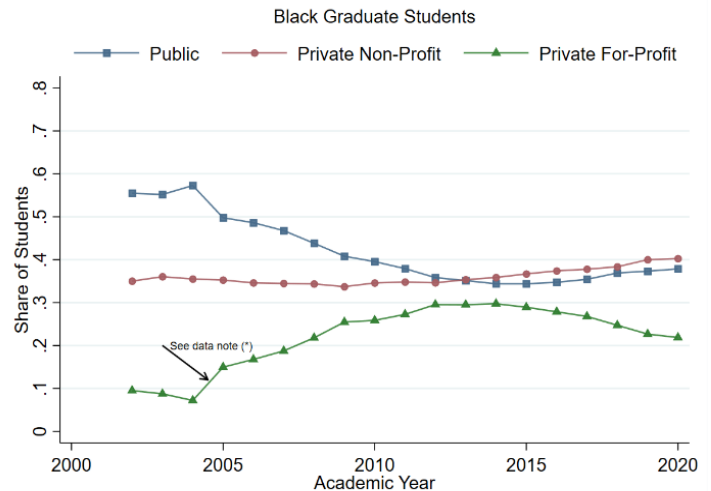


Figure 5.3: Distribution of Hispanic Graduate Students

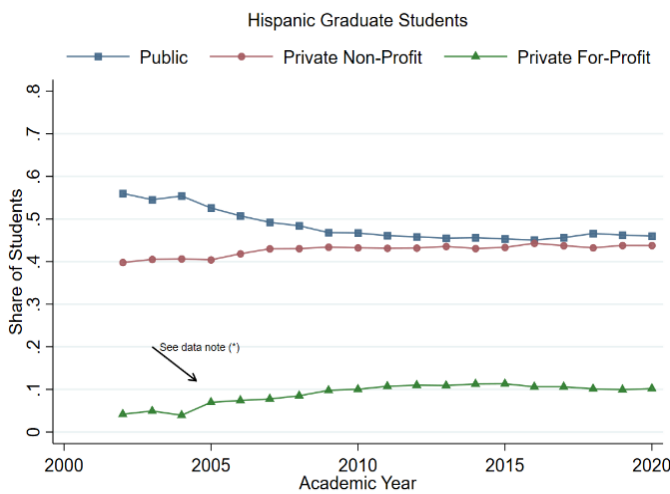
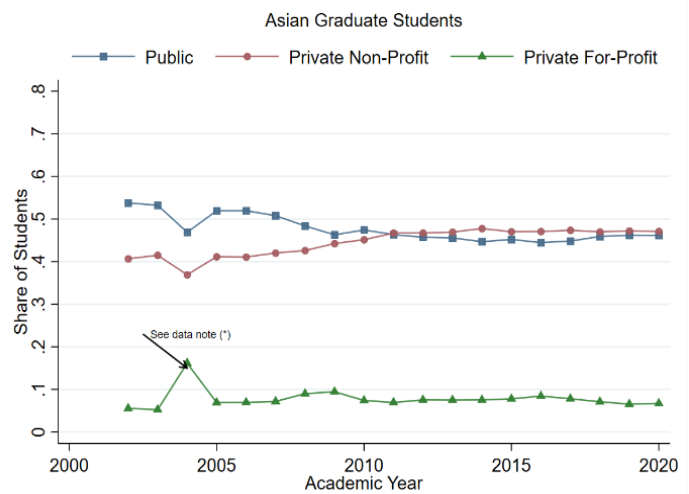


Figure 5.4: Distribution of Asian Graduate Students



Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Fall 2002 through Fall 2020, 12-Month Enrollment component.

Note: (*) In the school year 2004-05, University of Phoenix (a large private for-profit college) appears to have misreported enrollment accounts by race; this may have resulted in the misclassification of almost 10,000 Black students as Asian and/or Hispanic.

Borrowing Amounts Have Increased for Graduate Students

The increase in the number of students pursuing graduate degrees illustrated above has helped to drive growth in total graduate loan disbursements. But the amounts that students borrow to attend graduate school have increased as well. The upper panel of Table 1 shows averages among borrowers with at least

some debt for graduate studies (whether federal or private), and the lower panel shows averages among all college graduates (imputing a zero for students who did not borrow for graduate school).

On average, graduate school completers with debt in 2016 borrowed \$66,502 (in real 2020 dollars) in total to finance their graduate education. This figure has increased considerably in real terms since 2000, when average borrowing stood at \$53,140. The total amount borrowed for both graduate and undergraduate studies rose to \$88,832 in 2016, compared to \$71,499 in 2000. The third and fourth columns show cumulative amounts borrowed from the federal government also growing, and that most borrowing for graduate school is in federal student loans.

Table 1: Average Loan and Debt Amounts (2020 Dollars) among Graduate Students Expected to Complete their Program during the Survey Year: 2000 to 2016

	Cumulative Loan Amount		Cumulative Federal Loan Amount	
	<i>For Grad.</i>	<i>For Grad. + Undergrad.</i>	<i>For Grad.</i>	<i>For Grad. + Undergrad.</i>
Panel A. Graduate Borrowers only				
2000	53,140	71,499	—	—
2004	51,861	67,496	43,703	54,724
2008	49,033	66,931	41,805	53,460
2012	62,660	85,736	56,123	68,625
2016	66,502	88,832	61,390	80,400
Panel B. All Graduate Completers (Borrowers and Non-Borrowers)				
2000	26,849	39,077	—	—
2004	29,057	39,790	24,487	31,941
2008	27,629	40,167	23,556	31,541
2012	37,662	53,351	33,733	42,311
2016	38,545	54,065	35,582	48,441

Source: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Survey.

Table 2 shows a slight decline in the share of graduate completers who don't borrow for their graduate studies between 2000 and 2016, from 48.9 percent to 47.5 percent. At the same time, however, graduate completers appear to be borrowing increasingly larger loans to finance their graduate studies. Between 2000 and 2016, the share of graduate completers borrowing between \$40,000 and \$60,000 (in 2020 dollars) grew from 4.7 percent to 9.5 percent, more than a two-fold increase. The share who borrowed more than \$80,000 to pay for a graduate degree rose from 1.4 percent in 2000 to 10.8 percent in 2016, more than a seven-fold increase.

Table 2: Percent Distribution of Graduate School Completers by Cumulative Federal Loan Amount for Graduate Studies (2020 Dollars)

Distribution of Federal Borrowing Amounts for Graduate School
(Percent of completers only)

NPSAS-GR Year	Zero	Up to \$20,000	\$20,000 to \$40,000	\$40,000 to \$60,000	\$60,000 to \$80,000	More than \$80,000
2004	48.9	26.6	16.4	4.7	1.9	1.4
2008	49.6	21.7	14.8	8.4	2.5	3.0
2012	43.7	15.9	17.9	9.6	4.0	8.9
2016	47.5	14.5	13.1	9.5	4.7	10.8

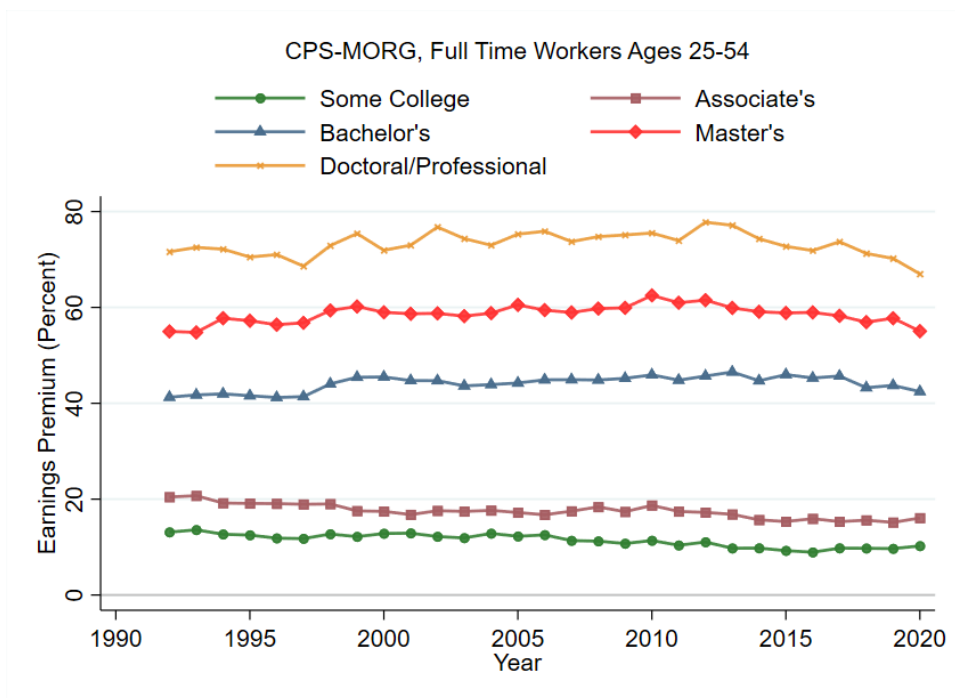
Source: U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Survey. Cumulative federal loan amount for graduate studies among those who completed a degree program in reported academic year.

While Average Earnings Premia for Graduate Degrees are High, They Have Stagnated as Borrowing Increased

Figure 6 shows that the earnings of graduate degree holders are significantly higher than those of both high school graduates and undergraduate degree holders, holding constant demographic and geographic differences among groups.

But despite the increases in borrowing seen over the past 20 years, the premia for different graduate degrees have changed little. For example, the premium to a master’s degree (relative to the earnings of a high-school graduate) hovered between 55 and 63 percent. This suggests that the net returns of graduate degrees may have fallen over the past 20 years, but further analysis of policy driven changes to the costs of student loans to graduate students and out-of-pocket payments is necessary.

Figure 6: Average Earnings Premium of Undergraduate and Graduate Degrees as a Percent Beyond the Typical Earnings of High School Completers: 1992 to 2021



Source: Current Population Survey 1992-2020, Merged Outgoing Rotation Groups.

Note: Earnings premium is measured as the difference in average log earnings between listed groups and high school completers, after adjusting for the following set of covariates: indicators for 5-year age categories (ages 25-30 is omitted), gender, marital status, gender interacted with marital status, race/ethnicity (Black, Hispanic, Asian and other, with White omitted), and indicators for state of residence. Regression models are estimated separately by year.

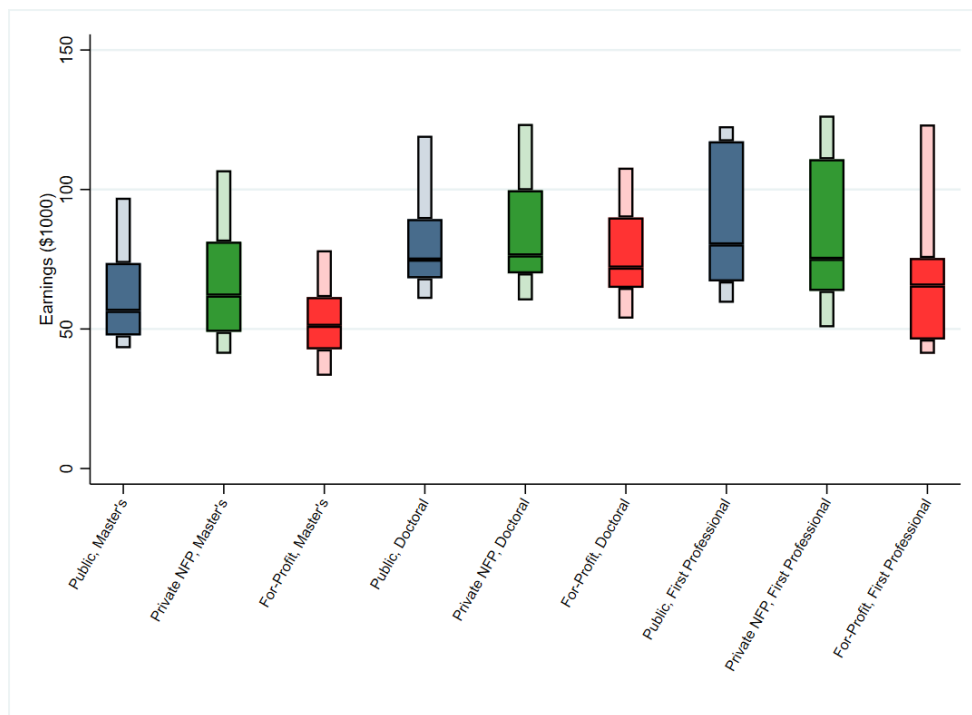
Earnings and Borrowing Outcomes for Graduate Degree Earners Differ Dramatically Across Programs, Within and Across Sectors

The average earnings premia for graduate degrees masks a tremendous amount of variation in the earnings outcomes of graduate students across specific programs. Figure 7 uses data from the Department’s 2022 Program Performance Data² to show the distribution of the median earnings of graduate programs in each sector. The bars range from the 10th to the 90th percentile of median earnings across programs. The darker shaded inner portion of the bar shows the interquartile range—i.e., the 25th to 75th percentile—and the bar in the center of that part of the bar shows the typical earnings of the median program in the sector. The Figure shows that graduates from professional and doctoral degree programs tend to have the highest earnings levels, with for-profit programs tending to have slightly lower earnings in each sector. Those differences are more pronounced among the highest earning programs in each sector: the 75th and 90th percentile programs in the for-profit sector have substantially lower earnings than their counterpart programs in the nonprofit and public sector.

² See a description of these data here: <https://www2.ed.gov/policy/highered/reg/heardulemaking/2021/nprm-2022ppd-description.pdf>.

More striking is the variation in earnings outcomes among programs within each sector. With the exception of the for-profit master’s and doctoral degree programs, in each sector the difference in the earnings of the median graduate of programs with earnings in the top 10 percent is more than \$50,000 higher than that of the median graduate of programs with earnings in the bottom 10 percent.

Figure 7: Distribution of Typical Earnings, Graduate Programs by Institution Control and Credential Level

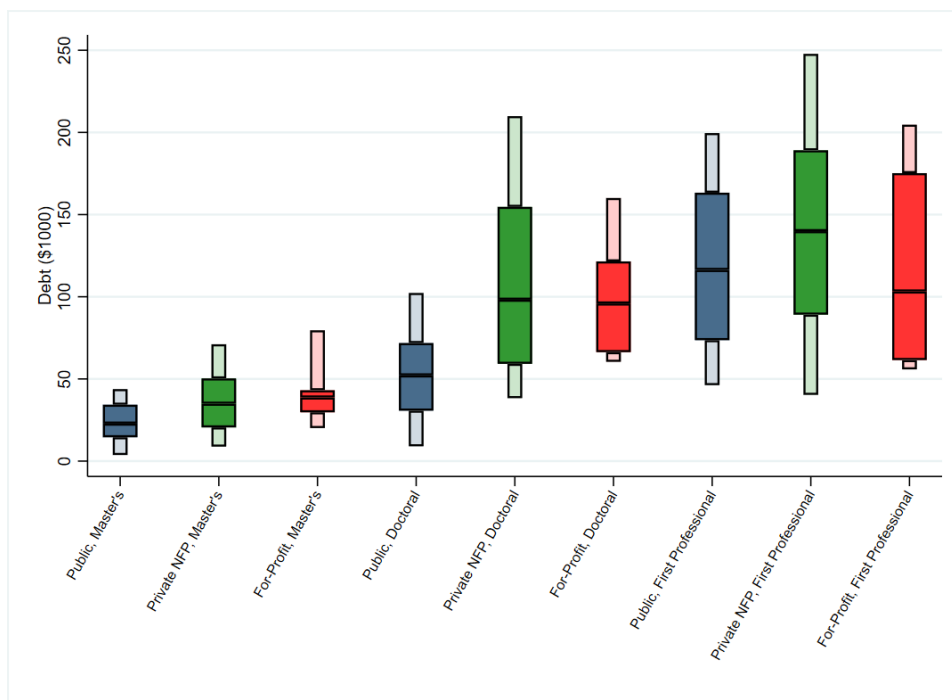


Source: 2022 Program Performance Data.

Note: Median earnings of graduates not enrolled 3 years after per program of study, measured in CYs 2018 and 2019, and inflation adjusted to 2019 dollars. Boxplots show interquartile range of the cross-program distribution of median earnings in dark hue (wide rectangle), extending to the 10th and 90th percentiles in light hue (thin rectangle). The abbreviation “NFP” stands for Private, Non-Profit institutions.

Figure 8 shows similar differences across programs in the amount of debt that graduate students acquire in earning a degree. The variation in borrowing levels (among borrowers) is much greater for doctoral and professional programs than for master’s programs, with some leaving graduates with extraordinarily high debts—for example, nearly 25 percent of professional programs in the private non-profit sector have typical federal debt loads of more than \$200,000. Across sectors, for Master’s and Doctoral programs both for-profit and private non-profit programs have substantially higher debt levels compared to public programs. But these differences are less pronounced among professional programs, where the distribution of typical debt levels are very high—more than half of programs in each sector have median borrowing amounts over \$100,000.

Figure 8: Distribution of Typical Debt, Graduate Programs by Institution Control and Credential Level



Source: 2022 Program Performance Data.

Note: Median debt (including zeroes, excluding Parent PLUS) for completers in award years 2015-16. Boxplots show interquartile range of the cross-program distribution of median debt in hue (wide rectangle), extending to the 10th and 90th percentiles in light hue (thin rectangle). The abbreviation "NFP" stands for Private, Non-Profit institutions.

The Link Between Graduate Student Debt Levels and Earnings Outcomes Is Weak, Raising Concerns over Financial Value

A key concern across all higher education programs is that the amount students pay for post-secondary credentials is often only weakly connected to the labor market payoff for the credentials they earn. A particular worry is that too many students take outsized loans relative to what they will likely be able to repay based on the typical earnings of graduates in a program. One might expect these problems to be muted among graduate students, who might be savvier in choosing their programs and who have a bachelor's degree to fall back on, but Figure 9 shows this is not the case among master's programs (by far the most common graduate degree awarded).

As depicted in Figure 9 by the solid plotted regression line, programs with higher borrowing tend to have higher earnings (measured 3 years after degree completion) in the public and private non-profit sectors – but in the for-profit sector this correlation is non-existent or even slightly reversed.³ But no sector exhibits

³ For some fields of study, early career earnings may not be a good proxy for longer term earnings outcomes. While College Scorecard data on the median earnings of graduates by program only allow us to measure 3 years post-completion, data from the Census Postsecondary Education Outcomes (PSEO) project contain median earnings estimates for programs at select colleges 1, 5, and 10 years post-completion. Medicine is the true outlier as a field, where graduate earnings appear to grow dramatically (on average) between 5 and 10 years after completion.

a strong connection between the debt and earnings outcomes of program graduates: among programs with similar borrowing levels there is enormous variation in earnings outcomes. Moreover, especially in the private non-profit and for-profit sectors, there are a significant number of programs with high median debt levels relative to their graduates' typical earnings. In recently [proposed regulations](#), the Department proposed a measure of a program's debt affordability, based on whether the annual debt service payments of the typical graduate are more than 8 percent of their median earnings or 20 percent of discretionary (i.e., earnings above 150 percent of the poverty line) earnings. In Figure 9, programs with debt levels above the dashed lines have high debt burdens. Using this definition, among programs with debt and earnings data available, 12 percent of master's degree programs offered by private non-profit institutions and about a quarter of programs at for-profit institutions have high debt burdens. In the public sector, the share of programs with high debt burdens is 2 percent (Table 3).

Figure 9: Relationship Between Median Graduate Program Debt and Median Program Earnings for Master's Degree Programs, by Institution Control

Figure 9.1: Public Master's Programs

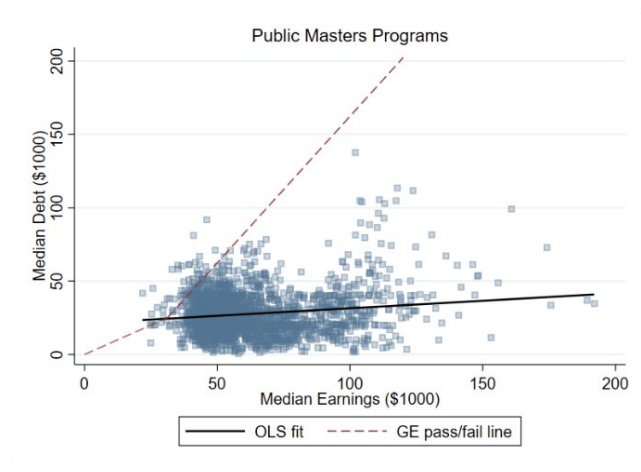


Figure 9.2: Non-Profit Master's Programs

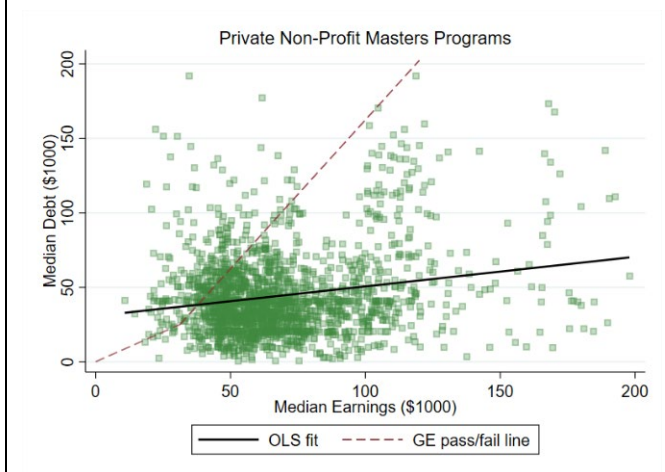
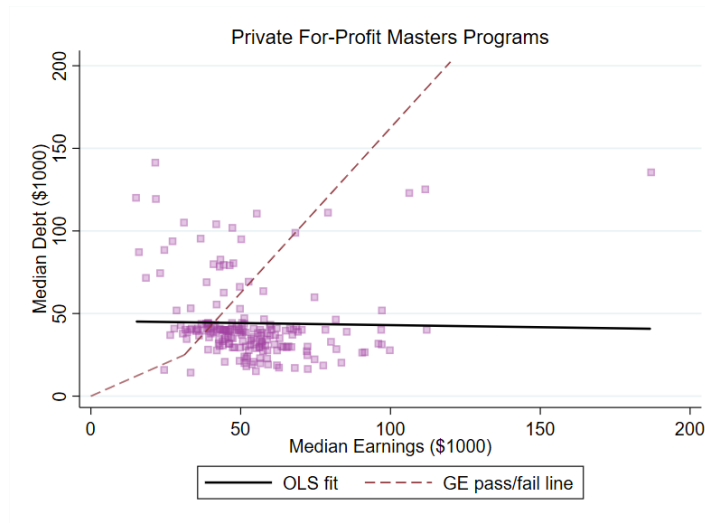


Figure 9.3: Relation for For-Profit Master's Programs

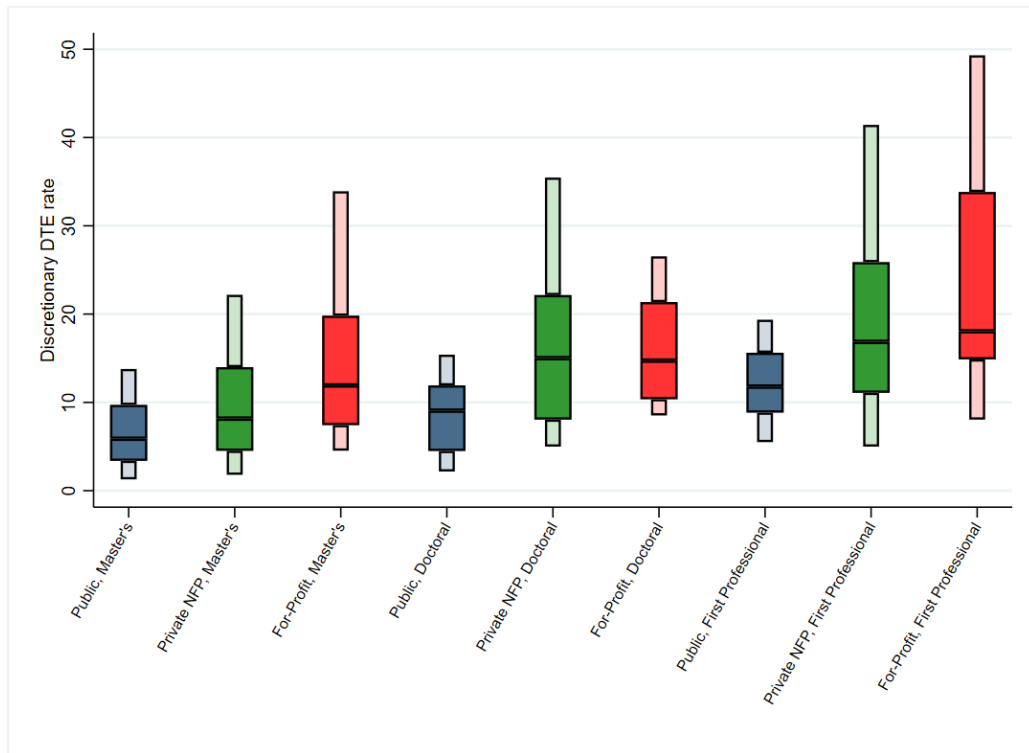


Source: 2022 Program Performance Data.

Note: Median earnings of graduates not enrolled 3 years after per program of study, measured in CYs 2018 and 2019, and inflation adjusted to 2019 dollars. Median debt (excluding Parent PLUS) for completers in award years 2015-16. The kinked dashed line in each panel shows the threshold between programs that have unaffordable debt, based on the definitions described in the Gainful Employment NPRM published in May of 2023.

Figure 10 shows how common it is for programs to leave graduates with high debt relative to their earnings. Among programs of the same credential level, the median debt to discretionary earnings ratio is lowest at public colleges and highest at for-profit institutions. The differences are most pronounced among professional programs, where the median discretionary debt to earnings (D/E) rate is 12.5 percent among public programs, 16.9 percent among private non-profits programs, and 18 percent among (very few) for-profit programs (this figure ignores the many programs where debt to earnings metrics are not available).

Figure 10: Distribution of Discretionary Debt to Earnings Ratio, Graduate Programs by Institution Control and Credential Level



Source: 2022 Program Performance Data.

Note: Median earnings of graduates not enrolled 3 years after per program of study, measured in CYs 2018 and 2019, and inflation adjusted to 2019 dollars. Median debt (including zeroes, excluding Parent PLUS) for completers in award years 2015-16. Boxplots show interquartile range of cross-program distribution of TDE in dark hue (wide rectangle), extending to the 10th and 90th percentiles in light hue (thin rectangle). The abbreviation "NFP" stands for Private, Non-Profit institutions.

Table 3 shows the fraction of programs, again amongst those programs where data are available, with unaffordable debt by academic level and institution control. This generally aligns with the share of programs with discretionary debt to earnings above 20 percent (seen in Figure 10).

Table 3: Percent of Programs with High Debt Burdens

	Public	Private Non-Profit	Private For-Profit	All Sectors
Master's	2	12	24	8
Doctoral	5	31	29	20
Professional	9	39	44	24

Source: 2022 Program Performance Data.

Note: Unaffordable debt is defined as a program having annual service payments on typical borrowing levels in excess of 8% of median earnings or 20 percent of median discretionary earnings (defined as earnings above 150 percent of the federal poverty line).

Protecting Graduate Students from Unaffordable Debt

Graduate education plays a critical role in developing advanced skills which in turn contribute to art, culture, and science in profound ways that improve our economy and society. To ensure that the pathways to these opportunities for higher learning remain open and safe for all to travel, it is important to ensure that students financing the often-exorbitant costs of these credentials do not end up with debts that are overly difficult to repay, or that harm their financial health.

The Biden-Harris Administration has already taken historic steps to address the strain that increased borrowing for graduate school has put on borrowers. This includes fixes to finally realize the promise of the Public Service Loan Forgiveness program, which has provided billions of dollars of debt relieve to teachers, nurses, and other public servants with graduate credentials.

The Department is also working to address the issue of unaffordable debt in graduate school proactively, protecting both students and taxpayers from programs unlikely to pay off. Earlier this year we improved the College Scorecard to put better information on the debt and earnings outcomes of graduate students at students' fingertips to enable them to make more informed choices about which program to attend. Finally, in a recently released Notice of Proposed Rulemaking (NPRM) on Gainful Employment regulations, the Department proposed to eliminate the eligibility to offer federal student loans to students in the for-profit sector for graduate programs that have unaffordable debts. Over a quarter of graduate students enrolled in programs with unaffordable debts are currently in for-profit programs, so the rule would represent a big step in addressing problems in the sector. For graduate programs outside the for-profit sector, the Higher Education Act offers different tools to protect students. In those programs, the proposed regulations would require students to acknowledge viewing disclosures about the typical debt and earnings outcomes of program graduates before they could take out a loan. This would create unprecedented transparency, and ensure students were informed about the potential financial consequences of enrolling in different programs before taking on debt.