



# Have Earnings for Graduate Degree Recipients Changed?

## Using Multiple Datasets to Describe Typical Graduate Degree Earnings

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Enrollment in American graduate degree programs is increasing, even as undergraduate enrollment declines continue in the wake of the COVID-19 pandemic.<sup>1</sup> With rising numbers of graduate awards, there has been increased attention on understanding the value of these degrees, especially master's degrees.<sup>2</sup> With more workers attaining higher credentials, the value of this credential could be diluted, causing the typical worker to earn less than they did a decade ago. But the growth in graduate degrees could be signaling a growing economic need and increased job openings for workers with specialized skills that can be attained through graduate education.

In this brief, I examine graduate degree attainment and workers' earnings over the past 30 years using data from the Current Population Survey (CPS), the American Community Survey (ACS), and student survey data from the National Center for Education Statistics. I use a broad, national lens to describe aggregate returns regardless of field of study, though research indicates that returns by field of study vary substantially.<sup>3</sup> I find that the earnings of graduate degree recipients rose, in inflation-adjusted dollars, until around 2000 and have stayed steady since. Although typical earnings for graduate degree recipients have remained level, the cost of a graduate degree, particularly in the form of student debt, has risen sharply, biting into the overall return on investment for graduate education.

## Background

The federal government supports graduate degree attainment primarily through federal student loans.<sup>4</sup> Students in graduate programs are eligible to borrow up to the cost of attendance, less other financial assistance, in student loans. Loans are not limited by program or degree type. In line with the broad strokes of federal loan policy, I aim to capture the aggregate typical earnings for those with graduate education.

Previous work on graduate student returns has indicated that graduate degree recipients achieve substantial economic returns (Carnevale, Rose, and Cheah 2013; Gándara and Toutkoushian 2017; Julian and Kominski 2011; Tamborini, Kim, and Sakamoto 2015). These returns do, of course, vary by field, with law, medicine, dentistry, business, and STEM (science, technology, engineering, and mathematics) degrees most associated with higher earnings (Altonji and Zhu 2021; Minaya, Scott-Clayton, and Zhou 2022).<sup>5</sup> Typical labor market returns on graduate degrees tend to be higher for women than for men and vary by race and ethnicity (with white graduates seeing higher returns than Black graduates or Asian graduates) (Altonji and Zhu 2021; Minaya, Scott-Clayton, and Zhou 2022).<sup>6</sup>

There are multiple approaches for examining earnings for a given degree. Some researchers focus on the individual return to the student, estimating what a person's income trajectory would be with or without the credential. And some evidence shows that certain graduate degrees do not deliver substantial individual monetary returns in the job market, relative to a counterfactual where students with a bachelor's degree do not attain a graduate degree (Stevenson 2016). But I look more broadly at aggregate or typical earnings for workers with a given credential, using multiple survey data sources.<sup>7</sup>

## Graduate Degree Attainment Is Increasing

In the 1990–91 school year, about 31 master's degrees were awarded for every 100 bachelor's degrees. By 2019–20, this number rose to 41 master's degrees per 100 bachelor's degrees.<sup>8</sup> Although the number of students receiving doctoral degrees<sup>9</sup> has risen 1 to 3 percent each year in the past decade, the ratio of doctoral degrees to bachelor's degrees has stayed more consistent, at 9 or 10 doctoral degrees awarded for every 100 bachelor's degrees, since the 1980s (Blagg 2018).

To understand the growth in graduate degrees among American workers, I use data from the ACS and decennial censuses, looking at the highest level of education reported by individuals in the labor force in different age ranges. The share of 25-to-29-year-olds in the labor force who have a bachelor's degree as their highest credential increased from 18 percent in 1990 to 30 percent in 2015–19, while the share with any graduate degree as their highest credential increased from 4 percent to 10 percent (table 1). This trend persists when we look at a slightly older cohort in each year; the share of 30-to-34-year-olds with any graduate degree in 1990 was 7 percent, compared with 16 percent in 2015–19. Most of the growth in graduate degree attainment is in master's degrees, though professional and doctoral degree attainment among those in the labor force also increased.

TABLE 1

**Highest Level of Educational Attainment among Individuals in the Labor Force, by Age Group***Graduate degree attainment has increased substantially since 1990*

	1990	2000	2009	2019
<b>Ages 25–29</b>				
Bachelor's degree	18%	21%	25%	30%
Master's degree	2%	4%	6%	7%
Professional degree beyond a bachelor's degree	1%	1%	2%	2%
Doctoral degree	0%	0%	0%	1%
Any graduate degree (total)	4%	6%	8%	10%
<b>Ages 30–34</b>				
Bachelor's degree	16%	20%	24%	27%
Master's degree	4%	6%	9%	12%
Professional degree beyond a bachelor's degree	2%	2%	3%	3%
Doctoral degree	0%	1%	1%	2%
Any graduate degree (total)	7%	8%	12%	16%
<b>Ages 35–39</b>				
Bachelor's degree	17%	17%	22%	25%
Master's degree	6%	6%	9%	13%
Professional degree beyond a bachelor's degree	2%	2%	3%	3%
Doctoral degree	1%	1%	1%	2%
Any graduate degree (total)	10%	9%	13%	18%

**Source:** Urban Institute analysis of US Census Bureau and American Community Survey (ACS) data.

**Notes:** Data for 1990 and 2000 are from a 5 percent sample of the decennial census, and data for 2009 and 2019 are from the 2005–09 and 2015–19 ACS five-year samples, respectively.

I use the Baccalaureate and Beyond (B&B) Longitudinal Study to validate these findings. The B&B survey was administered to a sample of bachelor's degree recipients in 1993 and 2008, following the cohort until 10 years after graduation (2003 and 2018). Nearly 20 percent of 1993 bachelor's degree graduates had master's degrees 10 years later, and 4 and 2 percent of graduates had first-professional and doctoral degrees, respectively.<sup>10</sup> For the 2008 cohort, the share with master's degrees increased to 26.9 percent. The estimated share of graduates with professional practice doctoral degrees increased to 5.4 percent, and the share with research doctoral degrees declined slightly to 1.8 percent.<sup>11</sup>

## Typical Earnings for Workers with Graduate Degrees Have Held Steady or Increased

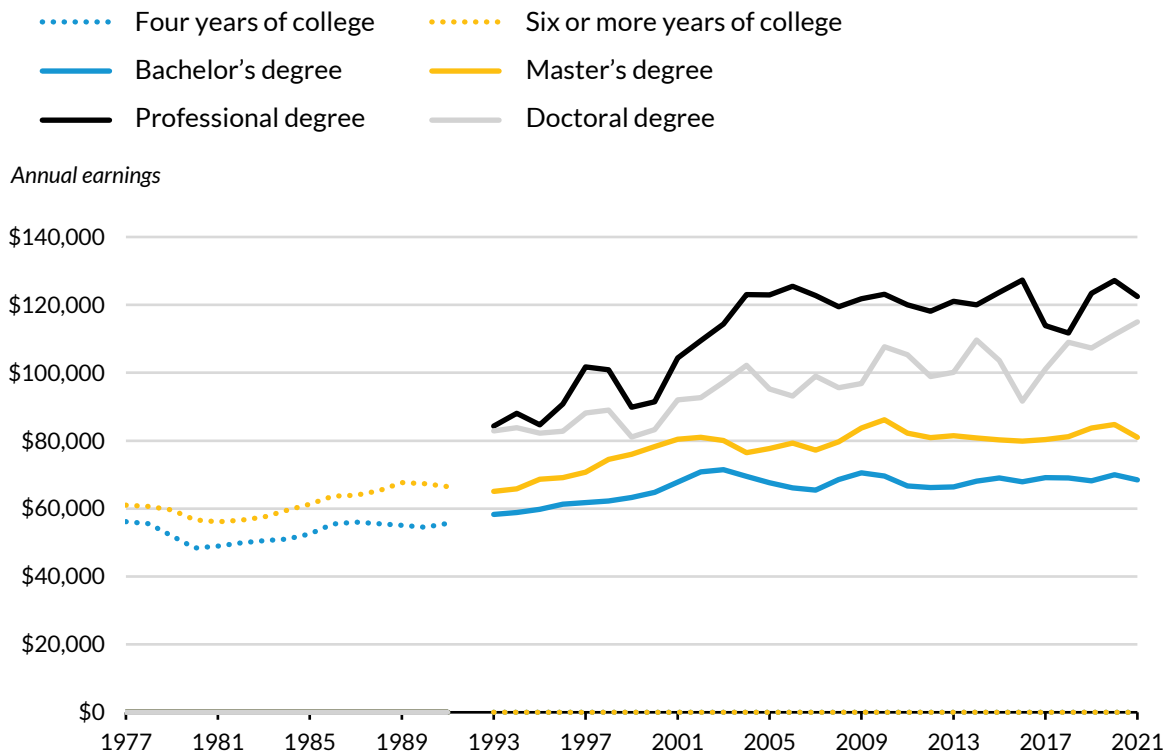
Given the increase in the share of working-age people with graduate degrees, I examine whether this increase has diluted the economic value of graduate degrees. As more workers have a given credential, the degree's wage and salary premium may decline. But typical earnings for a given degree could stay steady or even increase, as more positions requiring graduate degrees become available. I first use CPS data, which show trends in wage and salary earnings among workers with a given degree. I focus on median earnings for full-time or near-full-time workers ages 35 to 45.<sup>12</sup>

CPS data indicate that inflation-adjusted returns on years of college equivalent to a bachelor's or graduate degree were stable from the late 1970s to the early 1990s (figure 1). The measurement of graduate degree attainment changes in the early 1990s, allowing us to look more clearly at earnings for different degree types. There is some indication of an increase in median earnings for bachelor's and master's degrees from the mid-1990s to the early 2000s and more or less stable returns after that. Because of the sample size, data on professional degrees and doctoral degrees are less certain but generally follow the same trajectory and appear to have a steeper increase from the mid-1990s to the mid-2000s.

**FIGURE 1**

**Earnings for Workers with Graduate Degrees**

*After increasing in the late 1990s and early 2000s, earnings have stayed stable*



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**Source:** Urban Institute analysis of the Current Population Survey March Annual Social and Economic Supplement data, aggregated through the IPUMS Online Data Analysis System.

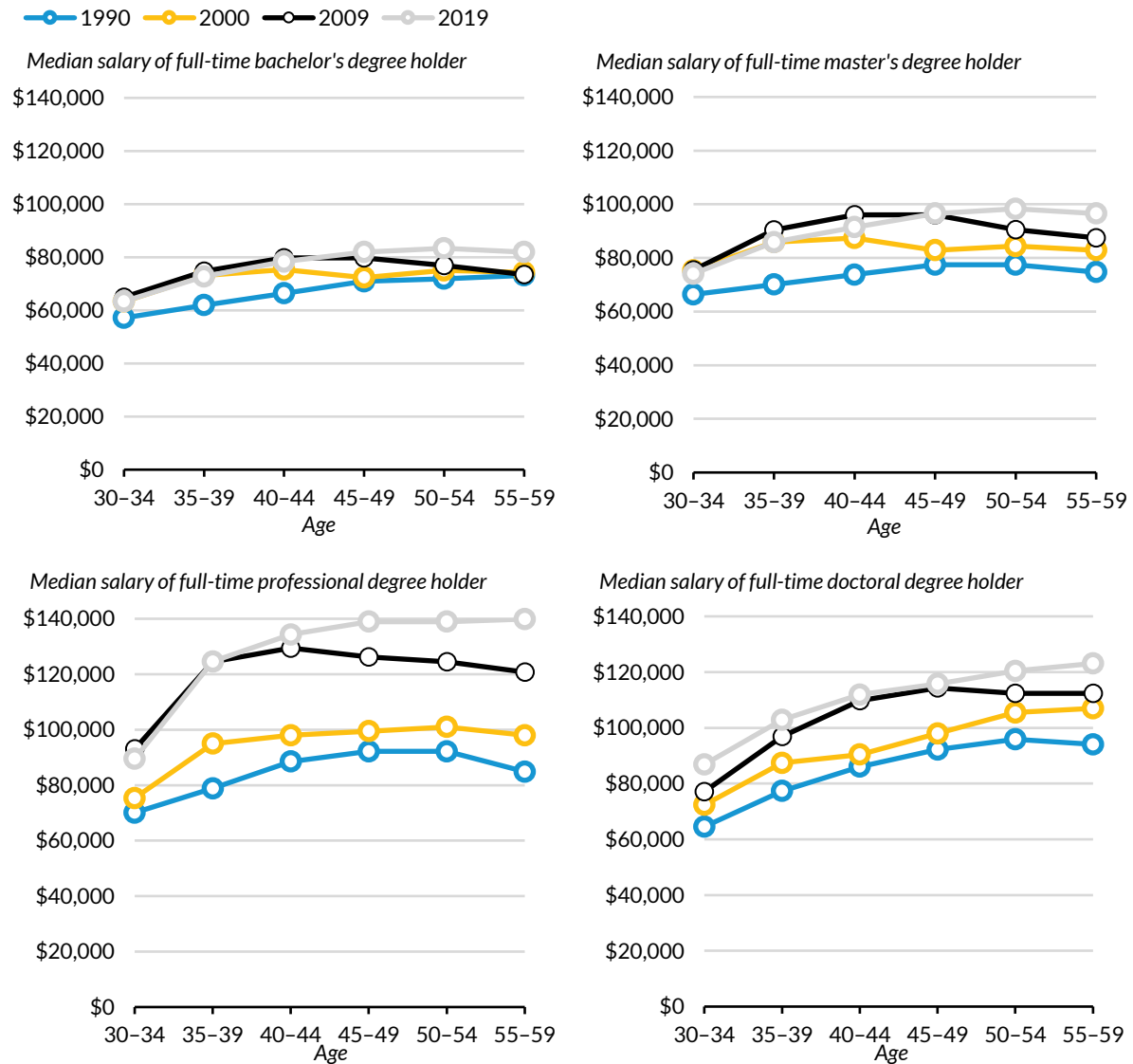
**Notes:** Data on graduate degrees by level are unavailable before 1992. Data are shown as a two-year rolling average of wage and salary income for those who reported full-time schedules or full-time (at least 35) hours (WKSTAT = 10 or 11). Values are inflated to 2021 dollars using the Personal Consumption Expenditures Price index. From 1977 to 1979, the survey asked about wages or salaries before any deductions. For later years, respondents were prompted to include overtime pay, tips, bonuses, and commissions from their primary employer and money from other employers.

In the CPS analysis, I focus only on 35-to-45-year-olds. But this cohort snapshot might not capture what is happening to earnings for other age cohorts. For example, recent master's graduates might have

earnings on par with previous cohorts when they are midcareer but might have had lower earnings when they first started their careers or may face more hurdles than previous cohorts in increasing their salaries as they age. Under these circumstances, different cohorts would have different lifetime earnings trajectories, affecting a degree's overall lifetime value, in terms of typical earnings (figure 2).

**FIGURE 2**  
**Median Salary, by Age Group, for Degree Holders in 1990, 2000, 2009, and 2019**

Median salaries have generally increased or held steady, across age groups, for full-time workers since 1990



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**Source:** Urban Institute analysis of American Community Survey (ACS) and decennial census data.

**Notes:** Data for 1990 and 2000 are from a 5 percent sample of the decennial census, and data for 2009 and 2019 are from the 2005–09 and 2015–19 ACS five-year samples, respectively. Values are inflated to 2021 dollars using the Personal Consumption Expenditures Price Index.

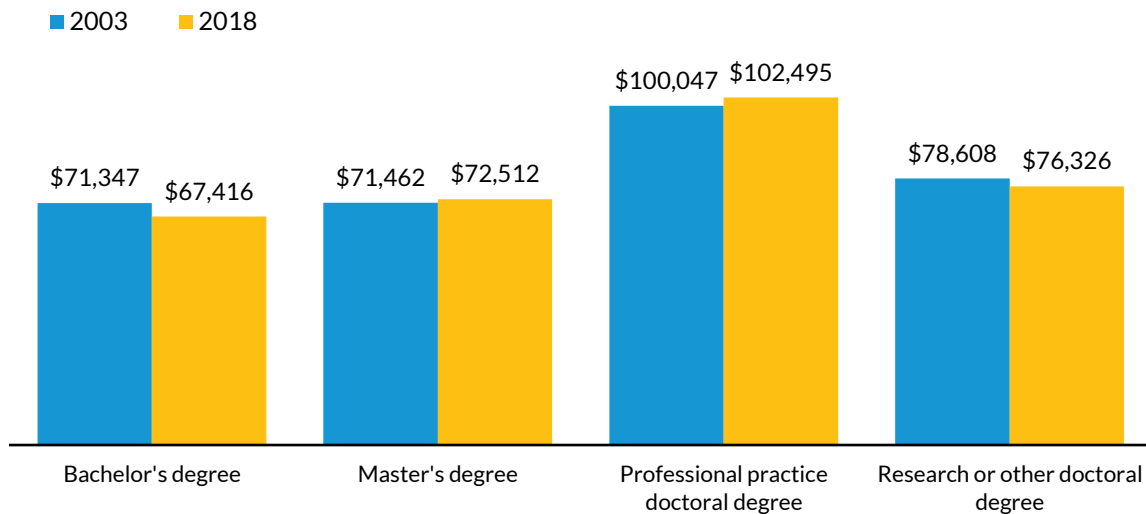
To assess earnings trajectories by year, I use data from the decennial census and the ACS. In line with my CPS findings, I observe that annual wage and salary earnings in 2000 and later years are generally higher, within age cohort and degree, than earnings in 1990 (figure 2). For those in the early stage of their career, the median salary of those with professional degrees (typically, an MD or a JD) also rose in inflation-adjusted terms from 2000 to 2009 and stayed relatively constant in 2019 (though increasing further for older cohorts). Among full-time workers with doctoral degrees, workers at similar ages have tended to see incremental increases in each successive year. When looking at labor market outcomes, researchers often divide outcomes by gender. But I see broadly similar patterns in the ACS data when looking at median earnings only for men who are employed full time and only for women who are employed full time. Both groups experience increases in median salary over time, particularly from 1990 to 2000, with those holding professional and academic doctoral degrees seeing larger increases.

A third way to assess earnings changes for workers with graduate degrees is to follow a cohort of bachelor's degree completers (from the B&B survey), comparing those who finished a bachelor's degree in 1993 (measured in 2003) with those who finished in 2008 (measured in 2018). Here again, median salaries, in inflation-adjusted dollars, are largely similar across time for those who have a graduate degree within 10 years of leaving a bachelor's program (figure 3). Typical earnings by degree have not changed for those in the workforce 10 years after attaining their bachelor's degree. In this analysis, however, I do observe differences by gender; women with professional practice or research doctoral degrees in 2018 are estimated to make slightly more than women in 2003 (men are estimated to make slightly less but within the margin of error). This difference could arise for many reasons, including small differences in the wording of survey questions related to salary between 2003 and 2018.

FIGURE 3

### Median Salary 10 Years after Bachelor's Degree Attainment, by Degree

Median salaries have stayed at similar levels, in inflation-adjusted dollars, for cohorts 15 years apart



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**Source:** Urban Institute analysis of Baccalaureate and Beyond Longitudinal Study data and Powerstats tables [neqtep](#) and [mmuygd](#).

**Notes:** Data are shown for survey respondents up to age 40, 10 years after they received their bachelor's degree, who are not currently enrolled in school. For the 2003 data, the salary amount is reported as the current or most recent median annualized salary as of 2003 (including zeros). For 2018 data, the salary is reported as median annualized total salary for all current jobs, as of the 2018 interview, including zeros. Both values are inflated to 2021 dollars using the Personal Consumption Expenditures Price Index.

## Rising Debt Is Eroding the Economic Returns on Graduate Degrees

Estimates of annual salary for the typical worker with a graduate degree have stayed steady or even grown, in inflation-adjusted dollars. From current data, graduate degree attainment increases do not appear to have suppressed wages. Instead, the risk to pursuing a graduate degree appears to come from the amount of loans or other funds needed to attain the degree and the possibility of not finishing the degree.<sup>13</sup>

TABLE 2

**Share of Degree Completers with Any Student Debt***Borrowing rates have not changed substantially over time*

	2000	2004	2008	2012	2016
Bachelor's degree	60%	63%	65%	67%	65%
Master's degree	47%	59%	63%	65%	60%
Professional degree	81%	85%	85%	85%	75%
Doctoral degree	44%	51%	49%	49%	51%

**Source:** Urban Institute analysis of National Postsecondary Student Aid Study data and Powerstats tables [buqbd](#) and [jjwyqg](#).

**Note:** Data are shown for students who are in the completion year for their degree.

Borrowing rates have not changed dramatically for most degrees; in 2000, 60 percent of bachelor's degree completers ever borrowed, compared with 65 percent in 2016 (table 2). Borrowing rates rose from 44 percent to 51 percent for doctoral degrees and fell slightly, from 81 percent to 75 percent, for professional degrees (e.g., MDs or JDs). Borrowing rates did increase more substantially for master's degrees, from 47 percent to 60 percent.

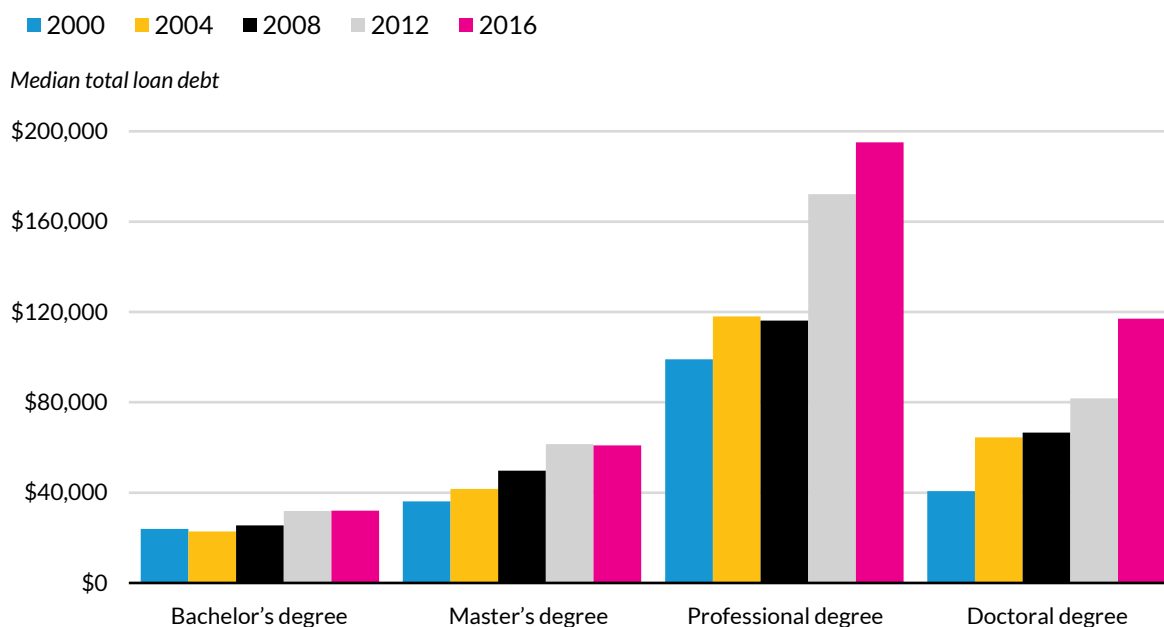
Although borrowing rates have not shifted much, the amount borrowed to complete a graduate degree has increased substantially. Between 2000 and 2016, the median debt among borrowers completing master's degrees nearly doubled, rising from \$36,157 (in 2021 inflation-adjusted dollars) to \$60,945 (figure 4). In contrast, typical debt for borrowers completing bachelor's degrees increased from \$23,953 to \$31,966. The increases for borrowers obtaining professional doctoral degrees or research doctoral degrees roughly doubled from 2000 to 2016.



FIGURE 4

### Median Debt among Degree Completers, in 2021 Dollars

Student loan debt has nearly doubled for those earning professional degrees



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Source: Urban Institute analysis of National Postsecondary Student Aid Study data and Powerstats tables [buqbd](#) and [jjwvqg](#).

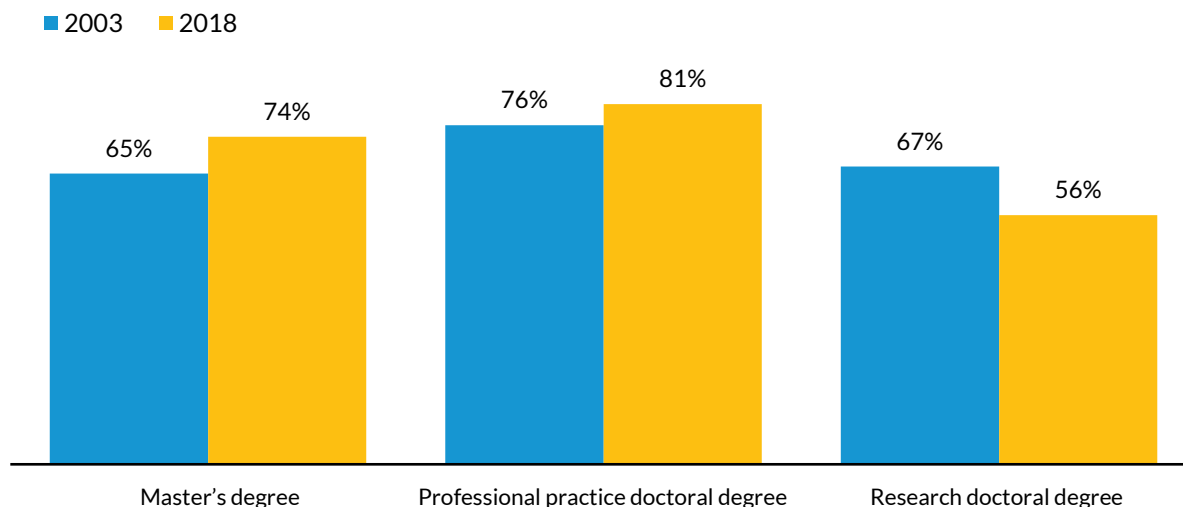
Notes: Data are shown for students who are in the completion year for their degree. Total debt includes private debt, includes any debt (e.g., debt for undergraduate education) incurred by the student, and is inflated to 2021 dollars using the Personal Consumption Expenditures Price Index.

Given the steady earnings trajectories after the early 2000s, increases in debt levels tend to increase the risk of pursuing higher education, particularly graduate education. Although typical master's degree earnings have held steady, borrowers now carry, at the median, nearly \$25,000 in additional debt. In other words, graduate degree earnings are steady, but students are now borrowing more to achieve those earnings. Much of this trend may be because of the implementation of federal Grad PLUS loans in 2006, which can help borrowers pay for up to their entire cost of education (GAO 2018). In contrast, federal loans for undergraduate education are subject to annual limits that have not changed since 2008 (Delisle and Blagg 2022). Policies such as federal income-driven repayment, which allow debt to be repaid according to the borrower's income, can mitigate the risk of these loans (and may induce students to take on more debt) but can increase the amount of time needed to repay the loan or to earn forgiveness.

Increases in debt levels also convey risks if students do not complete the degree and are less likely to attain the higher earnings a given degree confers. Although completion rates for graduate degrees are high, some students do not complete the credential. Graduation rates appear to have increased for some graduate degrees (figure 5). Compared with those who attained bachelor's degrees in 1993, those

who attempted master's or professional practice degrees within 10 years of undergraduate graduation in 2008 were more likely to have completed them. Completion rates for research doctorate degrees fell slightly, though this might be attributable to differences in how the doctoral degree category was defined in the 2003 and 2018 surveys.

**FIGURE 5**  
**Estimated Completion Rates for Graduate Degrees within 10 Years of Bachelor's Degree Receipt**  
*Completion rates have increased for master's degrees*



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**Source:** Urban Institute analysis of Baccalaureate and Beyond Longitudinal Study data and Powerstats tables [hyrhqv](#) and [lnivqq](#).  
**Notes:** Data are shown for survey respondents 10 years after they received their bachelor's degree and who are not currently enrolled in school. In the 1993/2003 survey, the professional practice degree is a first-professional degree, and the research doctoral degree is a doctoral degree. In the 1993/2003 survey, 7.8 percent of those who reported enrolling in a doctoral degree program attained a first-professional degree. In the 2008/2018 survey, 13.2 percent of those who reported enrolling in a research doctoral degree program attained a professional practice doctoral degree.

My work looks at typical earnings and debt by degree level, but earnings and debt also vary within subject areas and within specific programs. The diversity of program returns and debt levels, particularly for master's degrees, can convey substantial additional risk for students who enroll in programs with high debt and relatively low postgraduate earnings. Degree level, debt, and completion rates may also vary by student background and resources. Men and students from high-income backgrounds are more likely to seek professional doctoral degrees, while women and students from low-income backgrounds are more likely to enroll in masters' degree programs (Baum and Steele 2017).

## Conclusion

Over the past couple decades, the number of graduate degrees awarded has increased substantially. Using multiple datasets, I show that, despite increasing numbers of workers obtaining these credentials,

overall earnings for workers with graduate degrees have held steady, or slightly increased, over time. These results could point to growing labor market demand for workers with graduate credentials, rather than a dilution of the value of graduate degrees attributable to oversupply.

Policymakers should note, however, the increasing amount of debt that students take on to attain these degrees. And those who enroll in graduate degree programs face other risks, such as failing to complete their program or earning a degree in a low-paying field or at a program that produces low earnings. A typical graduate education still pays off, in terms of aggregate earnings, though some individuals may not see an adequate return on investment, particularly if they enroll in programs with low earnings potential or if they take on substantial loans.

## Notes

- <sup>1</sup> “Stay Informed with the Latest Enrollment Information,” National Student Clearinghouse Research Center, October 20, 2022, <https://nscresearchcenter.org/stay-informed/>.
- <sup>2</sup> See, for example, a recent article decrying master’s degrees as the “second-biggest scam in higher education” (James S. Murphy, “Millennials and Gen Zers Are Getting Swindled by the Biggest Scam in Higher Education,” *Business Insider*, May 22, 2022, <https://www.businessinsider.com/masters-degree-scam-higher-education-millennials-genz-student-loan-debt-2022-5>), and articles highlighting low returns on certain law degree programs (see Paul Campos, “The Law-School Scam,” *Atlantic*, September 2014, <https://www.theatlantic.com/magazine/archive/2014/09/the-law-school-scam/375069/>; and Aylett Sheffey, “Meet a First-Generation Attorney with \$347,000 in Student Debt Who Can’t Land a Job and Says ‘There Are a Substantial Number of People Like Me That Are Being Forgotten,’” *Business Insider*, July 17, 2022, <https://www.businessinsider.com/meet-attorney-347k-student-loan-debt-no-job-biden-forgiveness-2022-7>).
- <sup>3</sup> Sandy Baum, “How Well Does Graduate School Pay Off?” *Urban Wire* (blog), Urban Institute, April 23, 2018, <https://www.urban.org/urban-wire/how-well-does-graduate-school-pay>
- <sup>4</sup> Other direct or indirect sources of federal support for graduate education include federal work-study awards, Teacher Education Assistance for College and Higher Education grants, National Science Foundation grants for research conducted in higher education institutions, and direct National Science Foundation grants to graduate students.
- <sup>5</sup> See also Baum, “How Well Does Graduate School Pay Off?”
- <sup>6</sup> See also Baum, “How Well Does Graduate School Pay Off?”
- <sup>7</sup> Although I use multiple data sources, survey-based data, rather than administrative data, have some drawbacks. Data on very high earnings in public data sources such as the ACS and the CPS are concealed through top-coding or through swapping values with workers with similar incomes to protect respondent privacy. In the 2016–20 ACS, wages from income are top-coded at rates that range from around \$270,000 to \$780,000, depending on locality. In recent years of the CPS, individual incomes are top-coded for workers earning above \$999,999. In addition, accuracy of reporting in survey data varies. Highly educated earners tend to be more accurate in reporting earnings than those at similar earnings levels with less education, and Black workers with high earnings tend to underreport more than white workers with similar earnings (Kim and Tamborini 2014).
- <sup>8</sup> Digest of Education Statistics, table 318.10, [https://nces.ed.gov/programs/digest/d21/tables/dt21\\_318.10.asp?current=yes](https://nces.ed.gov/programs/digest/d21/tables/dt21_318.10.asp?current=yes).
- <sup>9</sup> Doctoral degrees include PhDs, EdDs, and degrees often classified as first-professional degrees, such as MDs, DDSs, and law degrees.
- <sup>10</sup> National Center for Education Statistics, PowerStats [table vkddlo](#).

- <sup>11</sup> On the 2018 B&B survey, example professional practice degrees were given as chiropractic, dentistry, law, medicine, optometry, pharmacy, podiatry, or veterinary medicine (Cominole, Ritchie, and Cooney 2021). I could not find similar documentation of the definition of first-professional degrees for the 2003 B&B survey. Some of this difference may be attributable to differences in interpretation of the doctoral degree type. The shift from 2.0 percent to 1.8 percent for doctoral degree recipients is within the 95 percent confidence interval for these estimates. See also National Center for Education Statistics, PowerStats [table lmcgqv](#).
- <sup>12</sup> An analysis with data for all respondents ages 35 to 45, regardless of working status, produces similar results.
- <sup>13</sup> In line with general student lending increases, graduate degree programs have seen an increase in tuition and fees, and student budgets, net of all grant aid. The median student budget, net of grant aid, increased from \$13,900 to \$20,600 in 2021 dollars for those earning master's degrees from 1996 to 2016 and from \$34,700 to \$57,000 for those earning first-professional degrees. See National Center for Education Statistics, PowerStats [table lzgekt](#).

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