



Postsecondary Equity & Economics Research Project

A joint initiative of
George Washington University,
Columbia University and Student Defense

How a Bachelor's Degree Earnings Threshold Could Be Used for Graduate Program Accountability

JUNE 2024

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The views expressed in this policy brief are solely those of the author.

The U.S. Department of Education's Financial Value Transparency and Gainful Employment ("GE") regulations take effect July 1, 2024, with the intention of holding colleges and universities accountable for programs leading to low earnings and high debt. As part of this effort, the Department will publicize whether a postsecondary program's graduates have earnings below that of a typical 25–34 year-old in their state who did not go to college. Students might lose access to federal financial aid if they enroll in for-profit institutions or "gainful employment" programs¹ that fail to meet this threshold.

The Department's new regulations do not apply different standards to undergraduate and graduate programs. In this report, I use American Community Survey (ACS) data to describe individual earnings with a graduate degree, and I explore the potential implications of using a higher earnings threshold for graduate education based on a hypothetical bachelor's degree threshold, rather than earnings of an individual with no more than a high school education.

SUMMARY OF FINDINGS

A growing fraction of U.S. workers have master's, doctoral, or professional degrees, although this is more common among Asian and white Americans than American Indian, Native Alaskan, Black, and Hispanic populations.² Workers with graduate degrees earn significantly more than those with only bachelor's degrees, so much so that 9 out of 10 workers with graduate degrees would likely meet a high school earnings threshold. Note that this does not mimic the outcome of GE regulations, however, which are applied to program-level earnings, not individual earnings, and which limit sanctions to for-profit and GE programs.³

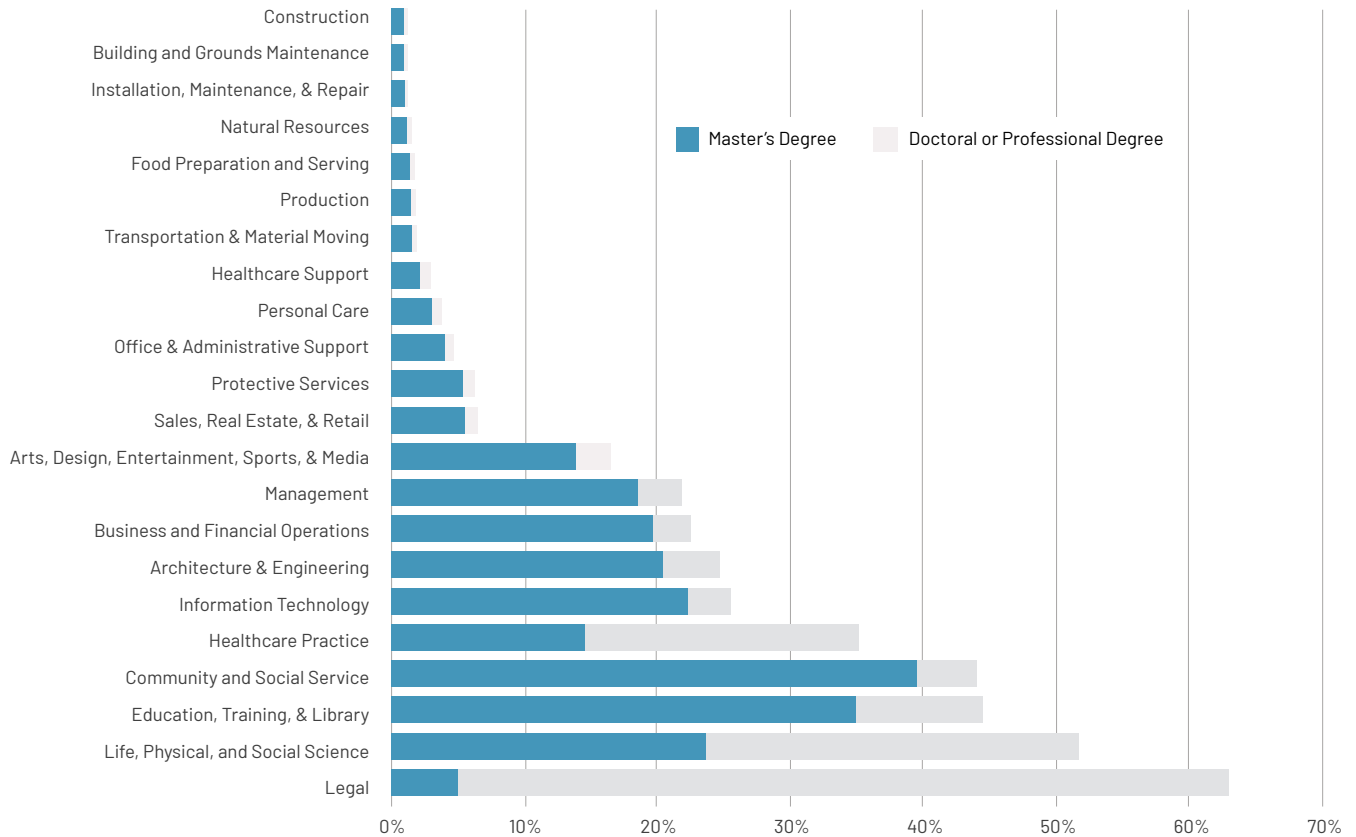
A smaller majority of graduate degree-holders would meet a higher threshold tied to earnings with a bachelor's degree, although this would be very uneven across occupations. For example, workers in architecture and engineering who have a master's degree are 88% likely to exceed typical earnings with a bachelor's degree, but master's degree-holders who work in social service are only 37% likely to earn that much. A more tailored bachelor's degree threshold equal to median income in a worker's *own* bachelor's degree field would achieve a similar overall pass rate with more consistency across occupations. Either bachelor's-level threshold is more likely to identify programs whose graduates end up in misaligned jobs that do not require graduate degrees.

About 1 in 7 U.S. workers have a graduate degree, and that share is rising.

Among 22–64 year-old workers included in the 2022 ACS,⁴ about 15% had a master's degree, doctoral degree, or post-baccalaureate professional credential like a J.D. or M.D. Focusing on workers with at least a bachelor's degree, 27% had a master's degree and another 10% had a doctoral degree.

Graduate degrees are more common in some jobs than others (Figure 1). About 44% of workers in community and social services have a graduate degree, for example, versus 1–3% of workers in healthcare support, transportation, production, food service, or construction.

Figure 1. Percent of workers with graduate degrees, by occupation group



Notes: Author's calculations using the 2022 ACS, limited to age 22–64 individuals in the labor force and not attending school. The figure plots the percent of individuals in each occupation group with graduate degrees. Statistics are computed using ACS person weights.

Having a graduate degree tends to correspond with more income, as discussed in more detail below, and Table 1 shows that jobs where graduate degrees are more common have higher median pay. Workers with jobs in law (judges, lawyers, clerks, and paralegals) have both the highest median income of any occupation group (\$83,000) as well as the highest rate of graduate degree attainment (63%). Jobs where graduate degrees are very uncommon usually pay less: \$22,100 for workers in food service, for example, or \$40,000 in construction. Yet jobs where a large percentage of workers have graduate degrees are not always high paying. Educators are 45% likely to have a graduate degree and they earn \$50,000 at the median. This is the same median pay as workers in installation, maintenance, and repair occupations, only 1% of whom have graduate degrees.

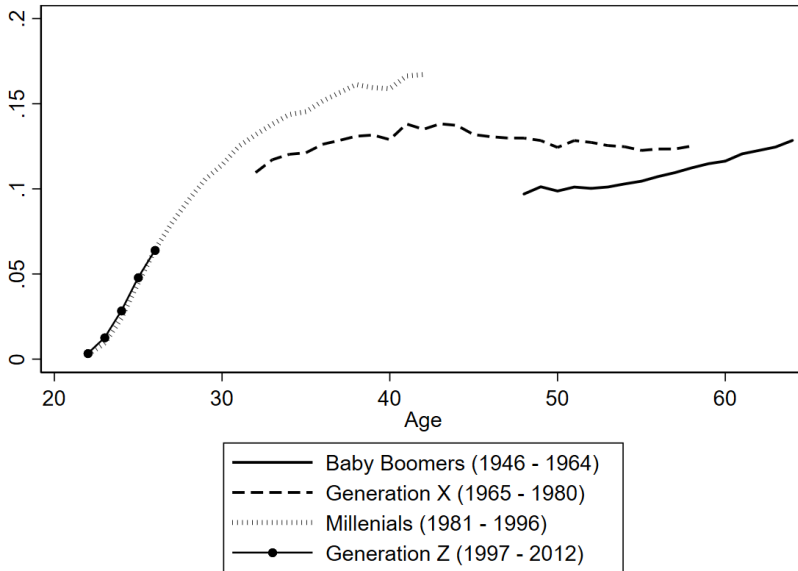
Table 1. Percent of workers with graduate degrees and median income, by occupation group

Occupation group	Percent of workers with a graduate degree	Median income (2022\$)
Legal	63%	83,000
Life, Physical, and Social Science	52%	70,000
Education, Training, & Library	45%	50,000
Community and Social Service	44%	48,000
Healthcare Practice	35%	65,000
Information Technology	26%	90,000
Architecture & Engineering	25%	87,000
Business and Financial Operations	23%	68,000
Management	22%	78,000
Arts, Design, Entertainment, Sports, & Media	17%	40,000
Sales, Real Estate, & Retail	6%	40,000
Protective Services	6%	55,000
Office & Administrative Support	5%	36,000
Personal Care	4%	19,000
Healthcare Support	3%	30,000
Transportation & Material Moving	2%	35,000
Production	2%	40,000
Food Preparation and Serving	2%	22,100
Natural Resources	2%	26,000
Installation, Maintenance, & Repair	1%	50,000
Building and Grounds Maintenance	1%	23,300
Construction	1%	40,000

Notes: Author's calculations using the 2022 ACS, limited to age 22-64 individuals in the labor force and not attending school. The table lists median income by broad occupation group along with the percentage of workers in each occupation. Statistics are computed using ACS person weights group who have at graduate degree.

The 15% share of workers with a graduate degree in 2022 is up from 11.5% in 2011, and is likely to grow further as older workers leave the workforce. Figure 2 plots the average rate of graduate degree attainment by age and generation. Members of younger generations are more likely to have pursued graduate degrees. About 14% of Generation X versus 11% of Baby Boomers had a graduate degree at age 50. In turn, Millennials were more likely to have a graduate degree at age 40 than Generation X (18% versus 14%), even though Millennials faced much higher tuition. It is too early to see how Generation Z will compare with their predecessors, since they were at most 26 years old in the 2022 ACS. So far, Generation Z is matching the Millennial rate of graduate degree attainment and is likewise on track to complete graduate degrees at higher rates than Generation X and Baby Boomers.

Figure 2. Percent of workers with graduate degrees, by age and generation



Notes: Author's calculations using the 2011-2022 ACS, limited to age 22-64 individuals not enrolled in school. The figure plots the percent of individuals with graduate degrees, by age and generation. Statistics are computed using ACS person weights.

American Indian, Black, Native Alaskan, and Hispanic workers are less likely to have graduate degrees.

Table 2 lists the percent of 22-64 year-olds in the 2022 ACS with graduate degrees, by race/ethnicity and gender. Workers who are American Indian, Native Alaskan, Black, or Hispanic are 5-14% likely to have graduate degrees, versus 14-19% for white workers, 9-17% for multiracial workers, and 25-38% for Chinese, Japanese, and other Asian workers. Women are more likely to have a graduate degree than men (except among Asian workers), although gender differences in graduate degree attainment are less pronounced than differences by race and ethnicity.

Table 2. Percent of workers with graduate degrees, by race, ethnicity and gender

Race or Ethnicity	Male	Female
American Indian or Alaska Native	5%	8%
Black or African American	9%	14%
Chinese	38%	37%
Japanese	25%	25%
Other Asian or Pacific Islander	29%	26%
White	14%	19%
Other race	4%	7%
Multiracial: Two races	9%	12%
Multiracial: Three or more races	12%	17%
Hispanic	6%	9%

Notes: Author's calculations using the 2022 ACS, limited to age 22-64 individuals in the labor force and not attending school. Statistics are computed using ACS person weights.

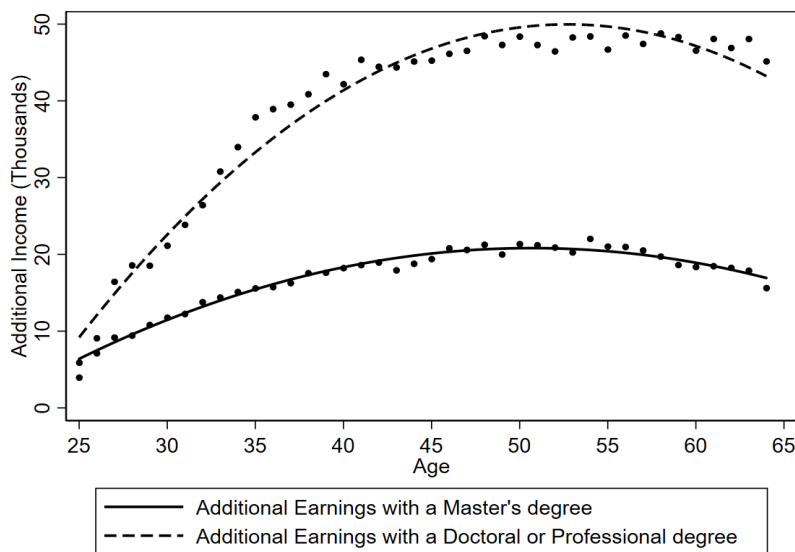
Workers with graduate degrees typically earn more than workers with less education, and the earnings premium rises with age.

Race and ethnicity differences in graduate degree attainment may matter for inequality in employment and earnings, since having a graduate degree is strongly associated with better employment outcomes. Among 22–64 year-old workers in the 2022 ACS, income with a master’s degree was \$78,000 at the median, and median income with a doctorate or professional degree was \$100,000. This is 30–67% greater than median \$60,000 income with a bachelor’s degree, and 2–3 times greater than median income with a high school diploma (\$34,000). The unemployment rate favored workers with graduate degrees as well: Just 1–2% of workers with graduate degrees were unemployed in 2022.⁵

Individuals in the ACS report their bachelor’s degree field or major, but not their graduate degree field. Nevertheless, we can use bachelor’s degree field data to understand how earnings compare with and without a graduate degree among workers with the same undergraduate background. For example, consider three hypothetical individuals who live in the same state and who each completed a bachelor’s degree in Chemistry. Person A does not pursue a graduate education and works as a materials scientist. Person B goes on to earn a Master of Business Administration and ultimately works as an operations manager. Person C earns a doctorate in Chemical Engineering and later works as a research scientist. If they are part of the ACS, we can see their highest educational attainment (a bachelor’s degree for A, a master’s degree for B, and a doctoral degree for C), their occupation, as well as their annual income from wages and salary. We can also see that they each have a bachelor’s degree in Chemistry. We *do not* see what field A and B studied for their graduate degrees, so we cannot use the ACS to evaluate the earnings premium that comes with their specific graduate credentials. Observing undergraduate major does allow us, however, to examine the difference in earnings between people like A and B, and between A and C, who have the same undergraduate degree and completed different levels of advanced education.

Figure 3 plots the difference between median earnings with a graduate degree and earnings for other workers of the same age who have a bachelor’s degree in the same subject (in 2022 dollars). The solid line traces additional earnings over time with a master’s degree, essentially the person A-B difference in earnings. The dashed line traces the earnings gap between people with doctoral/professional degrees and people with bachelor’s degrees, again conditioning the comparison on having the same undergraduate major (the person A-C difference). For both levels of graduate education, the earnings gap increases with age. Workers with a master’s degree earn \$9,500 more than workers with a bachelor’s degree at age 30 and \$17,000 more at age 50, and the doctoral/professional earnings gap grows from \$19,400 at age 30 to \$48,900 at 50.

Figure 3. Graduate degree income premium over own bachelor’s degree field, by age



Notes: Author’s calculations using the 2011–2022 ACS, limited to age 22–64 individuals in the labor force and not enrolled in school. The figure plots the median gap between earnings with a graduate degree and median earnings with a bachelor’s degree in the individual’s own bachelor’s degree field. Statistics are computed using ACS person weights.

Adding up these differences over time, master's degree recipients earn \$558,000 more between age 25 and 64 than workers who earned a bachelor's degree in the same field but did not complete a graduate degree. The lifetime earnings premium with a doctoral or professional degree is \$1.6 million. These premia are on top of additional lifetime earnings with an undergraduate college education, which researchers have estimated to be over \$1 million, on average, relative to what a high school graduate can expect to earn without college.

Another way to express the wage and salary premium from graduate education is as a share of total U.S. earnings. Although workers with master's degrees accounted for 11% of the age 22–64 labor force in 2022, they earned 17% of total wage and salary income that year. The 4% of workers with doctoral and professional degrees earned 10% of total U.S. wage and salary income, more than twice their share.

We should be careful not to view the graduate earnings premium depicted in Figure 3 as the effect of attaining a master's or doctoral degree on later earnings, or as the expected return on investing time and tuition in a graduate program today. Figure 3 relies on older workers who completed their education years or decades ago. In addition, workers who attained graduate degrees might have had high earnings with or without advanced education. The additional earnings for graduate degree-holders that we see in the ACS might be inflated by selection bias from higher-skilled, higher-paid workers having a greater tendency to pursue graduate degrees. There are ways to adjust for estimated selection bias or narrow the focus to circumstances where selection bias can be avoided,⁶ but these methods are not applicable to all graduate programs, and they might not be transparent enough to elicit institutional change. Any new graduate program accountability, like GE, will likely need to use descriptive statistics to some degree, such as median earnings with a particular credential, or the percent of graduate degree recipients who earn more than a threshold level of income.

[Almost all graduate degree-holders would meet the GE high school earnings threshold, if applied at the individual level. A smaller, but still sizable, majority of graduate degree-holders would meet an earnings test tied to median income with a bachelor's degree.](#)

Gainful Employment and Financial Value Transparency criteria do not distinguish between certificate, undergraduate, and graduate programs. All are evaluated based on whether or not the median earnings of their graduates exceed those of a typical 25–34 year-old in their state without a college education. Returning to the earlier example, this approach assesses person A's undergraduate Chemistry program, person B's MBA, and person C's doctoral program against the same level of expected income without a college education.

Table 3 illustrates how graduate degree-holders might compare with a threshold like this applied at an individual level. Column 1 lists the percent of age 35–44 master's degree-holders in each occupation group who earn more than median income for high school-educated workers age 25–34 and living in the same state. Column 4 does the same for doctoral and professional degree-holders. A key difference from the GE earnings threshold (aside from being assessed at the individual rather than program level) is that I limit the graduate degree-holding population to age 35–44 to approximate the usual age *after* graduate school, when alumni earnings would likely be measured for accountability purposes. The median graduate student in the ACS is 29 years old, and 1 in 4 are 39 or older.

Table 3 suggests that the vast majority of graduate degree-holders, and likely most graduate programs, will easily exceed the high school earnings threshold: 88% of workers with master's degrees and 89% of workers with doctoral degrees earn more than the typical high school graduate in their state.⁷ The passing rate differs by occupation, but even in fields where graduate degrees are uncommon (arts, entertainment, and media occupations, as well as "Other Occupations" with 1–6% graduate degree representation in Table 1), someone with a master's or doctoral degree is 68–74% likely to exceed the high school earnings threshold.

Table 3. Percent of workers with graduate degrees who exceed earnings thresholds

	(1)	(2)	(3)	(4)	(5)	(6)
	Master's Degrees			Doctoral/Professional Degrees		
	Percent Meeting High School Earnings Threshold	Percent Meeting Bachelor's Earnings Threshold	Percent Meeting Bachelor's Earnings Threshold (Own Bachelor's Degree Field)	Percent Meeting High School Earnings Threshold	Percent Meeting Bachelor's Earnings Threshold	Percent Meeting Bachelor's Earnings Threshold (Own Bachelor's Degree Field)
All Occupations	88%	63%	66%	89%	74%	74%
Architecture and Engineering	96%	87%	71%	96%	89%	79%
Information Technology	95%	86%	76%	95%	86%	80%
Management	94%	81%	80%	93%	82%	81%
Business and Finance	90%	72%	69%	88%	73%	72%
Science	89%	64%	65%	93%	68%	68%
Healthcare Practice	88%	65%	66%	92%	82%	82%
Education	88%	46%	65%	91%	64%	68%
Law	87%	62%	64%	89%	79%	79%
Social Services	87%	38%	55%	83%	47%	56%
Other Occupations	74%	46%	47%	68%	41%	41%
Arts, Entertainment, and Media	68%	43%	46%	69%	47%	49%

Notes: Author's calculations using the 2011–2022 ACS, limited to individuals in the labor force and not attending school. Each column lists the percent of graduate degree-holders (master's degrees: columns 1–3; doctoral and professional degrees: columns 4–6) working in occupations listed at left whose annual income exceeds a particular threshold. The high school earnings threshold is equal to median income for workers in the same state, age 25–34, who have no more than a high school diploma (columns 1 and 4). The first bachelor's earnings threshold is equal to median income for workers in the same state, age 35–44, who have a bachelor's degree and no graduate degree (columns 2 and 5). The second bachelor's earnings threshold is equal to median income for workers in the same state, ages 35–44, who have a bachelor's degree in the same field, and no graduate degree (columns 3 and 6). Statistics are computed using ACS person weights.

Median income among age 25–34 high school graduates is a low bar for assessing what someone might have earned without a graduate degree. Graduate students often enroll midcareer, and about 1 in 3 are older than the 25–34 year-old reference group. Income generally increases with age regardless of college credentials, so graduate degree holders will naturally compare well with younger high school graduates. Income also tends to increase with more education, and the question for graduate accountability purposes is whether programs add enough value to justify the cost.

An earnings threshold anchored to midcareer income with a bachelor's degree would be a stronger signal of insufficient value added and a better approximation of what someone might have earned had they not pursued an advanced degree. Columns 2 and 4 of Table 3 explore the implications of such a threshold by listing the percent of age 35–44 graduate degree-holders whose income is greater than median income with a bachelor's degree in the same age range and state. This essentially compares Chemistry majors B and C, who went on to earn graduate degrees, to person A and everyone else in their state and cohort who stopped with a bachelor's degree.

Compared with the high school earnings threshold, a smaller but still sizable majority of graduate degree-holders would meet an earnings test tied to earnings with a bachelor's degree. Just under two-thirds of age 35–44 workers with master's degrees and three-quarters of workers with doctoral or professional degrees earn more than median income with a bachelor's

degree in their state and age group. This varies quite a lot by occupation. Graduate degree-holders are 81–89% likely to meet a bachelor’s-level earnings threshold if they work in architecture and engineering, information technology, or management, versus 38–47% likely if they work in social services. Similarly, just 46% of educators with master’s degrees earn at least as much as someone with a bachelor’s degree in their state, rising to 64% for educators with a doctorate or professional degree.

Income with a graduate degree but a job where that level of education is unusual—entertainment, construction, office administration, or protective services, for example—is unlikely to exceed income with a bachelor’s degree alone (41–47%). Given low rates of graduate degree-holding in the Arts/Entertainment/Media and “Other Occupation” groups, this could be in part due to poor student performance, poor program quality, or a misalignment of skills and knowledge between graduate degree field (which we do not observe in the ACS) and occupation.

Unlike most high school diplomas, bachelor’s degrees are differentiated into colleges and majors that lead to very different levels of income. The average difference in lifetime earnings between an engineering and education major can be as large as the difference between a college graduate and a high school graduate. A big part of the variation in post-schooling income is driven by differences in the jobs accessible with a particular degree. A Humanities major is less likely to be qualified for an entry-level job as an engineer than an Engineering major, and likewise, and Engineering major might not have the skills necessary to work as a teacher or social worker. A student’s college major is a decision node from which many different pathways emerge. Although these pathways are porous, research has consistently found that major choice leads to a wide range of income trajectories. For the purposes of graduate program accountability, this means that median earnings with a bachelor’s degree is an imprecise measure of what someone could earn with their specific bachelor’s degree. Rather than compare Chemistry majors B and C with all bachelor’s degree recipients, we might rather see what they earn relative to person A, who made the same undergraduate major choice but opted not to go on to graduate school. With this in mind, columns 3 and 6 of Table 3 adjust the earnings threshold to be equal to median earnings in an ACS respondents’ own bachelor’s degree field.

This refinement increases the percent of graduate degree-holders meeting the earnings threshold for lower-paying, often public-sector occupations like education and social services. Graduate-educated workers in these fields tend to have bachelor’s degrees in education, social sciences, and the liberal arts. These degree fields correspond with lower earnings after college, which reduces the earnings threshold and improves the rate at which educators and social service workers with graduate degrees exceed expected earnings with no more than a bachelor’s degree (from 38–64% to 55–68%).

On the other end, tailoring the reference point to one’s own undergraduate degree field decreases the percent of graduate degree-holders in high-paying jobs who meet the earnings threshold. Workers in architecture, engineering, and information technology tend to have bachelor’s degrees in aligned fields like engineering and science. Jobs arising from these fields pay well with or without a graduate degree, so measuring income against that higher benchmark results in a smaller percent meeting the bachelor’s-degree threshold (from 81–89% to 71–81%).

Policy implications for graduate program accountability

Nearly 90% of workers with master’s and doctoral/professional degrees earn more than the median income without college in their state, which suggests that a large majority of graduate programs (but certainly not all) would meet the current GE earnings test. A higher graduate program earnings threshold, such as median income with a bachelor’s degree, would likely decrease the number of programs clearing that bar: 63% of master’s degree-holders and 74% of doctoral/professional degree-holders earn more than the median college graduate in their state. Pass rates with a hypothetical bachelor’s-level threshold vary across occupation groups and would likely sanction programs that lead to public sector jobs in education and social service, where graduate degrees are very common.

To address this potential drawback, a stronger measure of would-be income without a graduate degree may be typical income in the field where graduate students earned their undergraduate degree. My estimates using the ACS suggest that overall pass

rates with an own-bachelor's GE threshold would be similar to pass rates with an all-bachelor's threshold, with less penalty to public-sector jobs.

The Department of Education highlighted inadequate data as a challenge in implementing the latter approach of an own-bachelor's threshold.⁸ The ACS is a large survey, but not large enough to estimate median earnings for all undergraduate fields and all states. In addition, the ACS reports more aggregated undergraduate degree fields than what the Department uses for GE tests and other transparency efforts like the College Scorecard. Setting aside logistical challenges with an own-bachelor's income test, there are risks from specifying an accountability threshold too finely. With a program-level evaluation, small programs might see the own-bachelor's counterfactual fluctuate unpredictably from one cohort to the next. Savvy programs directors might also be incentivized to strategically admit students who they expect to show a larger return over their undergraduate degree, independent of their suitability for the program.

An all-bachelor's earnings test like the one shown in Table 3 columns 2 and 5 could be a feasible compromise that raises the bar for graduate programs without overcomplicating institutional responses to accountability. An all-bachelor's threshold would do a better job identifying programs whose alumni struggle to find aligned jobs and instead work in fields where graduate degrees do not pay off. Graduate degree-holders whose jobs rarely call for education beyond a bachelor's—in the arts, entertainment, media, food service, production, construction, or maintenance, among others—are likely to meet a high school-level earnings test but less likely to meet either bachelor's-level threshold.

The public-sector disadvantage from an all-bachelor's threshold could be reduced by setting the threshold to equal an income quantile lower than the median for some or all programs, which is justified by wide variation in income that follows a bachelor's degree. Alternatively, emphasizing this disparity through a watchlist or other information disclosure may have the intended effect of increasing transparency around expected earnings with graduate credentials, even if low pay is attributed to fiscal constraints or something other than program quality.

ENDNOTES

- 1 The Higher Education Act limits Title IV eligibility of certain career training programs to those that prepare students for gainful employment in a recognized occupation. The Department applies this standard for non-degree programs offered by public and non-profit institutions, as well as nearly all programs offered by for-profit schools. Gainful Employment programs also stand to lose access to federal aid if student earnings are low relative to debt burdens.
- 2 I refer to race and ethnicity populations using conventions from the ACS questionnaire text.
- 3 The vast majority of U.S. graduate programs are not GE programs, but under the new regulations, all will have alumni earnings and debt-to-earnings information published by the Department, and all are required to disclose poor earnings performance to prospective students.
- 4 ACS data are from IPUMS USA, University of Minnesota, www.ipums.org. For workforce statistics, I focus on ACS respondents who are in the workforce (either working or looking for a job) and not attending school.
- 5 Also see: Bureau of Labor Statistics. (2022). "Education Pays." <https://www.bls.gov/emp/chart-unemployment-earnings-education.htm>
- 6 We can estimate a more causal return to graduate education by studying places or programs where we have a good counterfactual estimate of what graduate degree completers would have otherwise earned. Scott-Clayton and Minaya review research that does this, finding that graduate degrees correspond with 12 – 25% higher earnings, on average, with some fields (such as health, law, and medicine) having higher returns than others (such as arts and humanities). Alternatively, we can adjust descriptive earnings gaps by assumptions about selection bias, as Cooper does in an analysis of how the earnings premium stacks up against the cost of attending graduate school. There, too, estimated returns vary widely across fields.
- 7 GE regulations preview what earnings test results will look like for career training ("GE") and other programs ("non-GE"). About 1% of GE students and well under 1% of non-GE students attend programs that fail the high school-level earnings test based on current data. This is difficult to reconcile with higher ACS estimates in Table 3. ACS data do not include dates of degree receipt or graduate degree fields that would allow me to replicate GE cohorts. In addition, 33% of GE students and 47% of non-GE students graduated from programs with fewer than 30 students or that otherwise had insufficient data to summarize debt or earnings (Tables 4.4 – 4.9).
- 8 See page 250: <https://www2.ed.gov/policy/highered/reg/hearulemaking/2021/nfrgeunofficialcopy.pdf>