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Higher Education Performance and Accountability: Insights from a New Visualization Tool

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Introduction

Higher education holds the promise of economic mobility and financial security. A large body of research confirms that for the average student, higher education is a good investment. Yet too many fail to see increased earnings or economic opportunities and struggle to repay their student loans. The federal government, states, students, and their families devote substantial resources towards higher education, but there are few federal guardrails that ensure these funds avoid supporting enrollment in institutions where poor outcomes can be expected. Although 1.23 million borrowers defaulted on federal student loans in 2019, only 15 institutions faced accountability measures that would potentially lead to restricted federal student aid program participation.¹ Past higher education accountability efforts improved student outcomes, but old systems need to be adapted to new realities in higher education.²

In “[Towards a framework for accountability for federal financial assistance programs in postsecondary education](#),” Matsudaira and Turner (2020) outline one potential approach to an higher education accountability system. Under this system, a program’s eligibility to provide students with federal aid would be linked to minimum standards for earnings and loan repayment.³ Specifically, programs would need to have either a positive loan repayment rate or a positive net earnings premium. The loan repayment rate (LRR) rate equals the change in a repayment cohorts’ aggregate student loan balances 3 years after the cohort entered repayment, relative to the cohort’s original aggregate balance (see Box 1). A positive LRR indicates that, as a whole, the borrowers were able to keep up with interest payments and reduce their loan principal by at least \$1. The LRR is negative when the cohort’s balance has increased over this period.

Box 1: Loan Repayment Rate Metric

$$LRR = 1 - \frac{(\text{Cohort balance in year 3})}{(\text{Cohort balance at repayment entry})}$$

Notes: A cohort includes all borrowers that entered repayment on their federal student loans in the same year. The balances of borrowers who were in school, had a military deferment, or were not required to repay their loans for other reasons (e.g., death or disability) as of their third year after entering repayment are excluded from both the initial cohort balance and the balance in year three. See Matsudaira and Turner (2020) for additional details.

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1. See <https://www.ed.gov/news/press-releases/national-federal-student-loan-cohort-default-rate-continues-decline>.
 2. In the late 1980s and 1990s, new regulations sanctioned a substantial number of primarily for-profit institutions due to high student loan cohort default rates (CDRs). Many of these institutions, where upwards of 30 percent of borrowers defaulted on their loans, closed or stopped participating in federal student aid programs (Darolia 2013; Looney and Yannelis 2019; Cellini et al. 2020). Students who would have enrolled in sanctioned for-profit institutions instead largely shifted to local community colleges, where they accumulated less student debt and were less likely to default on their loans (Cellini et al. 2020). With increased availability of income-driven student loan repayment plans – which benefit borrowers by linking payments to income – and other mechanisms used to reduce default without improving repayment (e.g., forbearance), CDRs have become a less meaningful measure of student wellbeing.
 3. Matsudaira and Turner (2020) define programs as a unique combination of credential level and field of study (i.e., 2-digit Classification of Instructional Program code) within an institution of higher education.

The net earnings premium (NEP) metric (shown in Box 2) compares the typical earnings of students who attended the program of study – measured 3 years after leaving the program and net of out-of-pocket costs – to their “counterfactual earnings” or the typical earnings for students with a lower level of education (high school in the case of undergraduate programs and bachelor’s degree in the case of graduate programs). A negative NEP indicates that after accounting for program costs, most students did not earn more than the typical worker who had not completed a similar program.

Box 2: Net Earnings Premium Metric

$$NEP = (\text{Median earnings}) - (\text{Median O.O.P. costs}) \\ - (\text{Median counterfactual earnings})$$

Notes: To calculate a program’s net earnings premium, students are grouped into “exiter cohorts” that consists of students who exited that program in a given year, excluding those currently enrolled in a different institution or program of study, and those who are disabled or deceased three years after exiting. For each cohort, the net earnings premium equals median cohort earnings less out-of-pocket (OOP) costs of attending the program (amortized to represent an annual payment over a given period) relative to their “counterfactual earnings” measured by the median earnings of individuals with lower education levels (i.e., high school graduates for undergraduate programs or bachelor’s degree recipients in similar fields for graduate programs) in the same state. Median cohort earnings are measured three years after program exit for all former students in the exiter cohort with positive earnings over the course of the year.

Approximately 9 percent of all students who leave a higher education program each year (around 670,000) attended programs predicted to have both negative net earnings and loan repayment (i.e., classified by Matsudaira and Turner (2020) as “failing”). Students in for-profit institutions are more than 2.5 times as likely to have enrolled in a failing program than those in public and private nonprofit schools. Outside of the for-profit sector, most failing programs coexist in schools with at least one alternative “passing” program.⁴ In other words, most students attending failing programs would have the option to attend a program that offered higher net earnings and/or loan repayment prospects in their same institution, at least in the public and nonprofit sectors.

Each undergraduate cohort loses an estimated \$4.7 billion in net earnings each year from enrolling in a failing program instead of a passing alternative in the same institution. Each graduate cohort forgoes a similar amount – \$3.6 billion in net earnings per year.

Matsudaira and Turner’s proposal focuses on one particular formulation of a higher education accountability policy. However, there are many other alternative formulations that would be consistent with the authors’ five

Box 3: Guiding Principles for the Design of Accountability Metrics

1. Represent minimum acceptable performance standards.
2. Linked to outcomes that are clearly and unambiguously good for students.
3. Difficult for schools to manipulate.
4. Simple and easy to understand, by both students and schools.
5. Multiple metrics should capture different dimensions of economic well-being.

4. Matsudaira and Turner (2020) consider a passing program to be an alternative to a failing program if it serves students at the same level as the failing program (undergraduate versus graduate).

guiding principles for accountability metrics, shown in Box 3. We have developed a [visualization tool](#) to assist higher education stakeholders in exploring such options.

A visualization tool for exploring alternative accountability metrics

The tool allows users to visualize quickly differences between programs and institutions along a number of dimensions. The “Accountability” section allows users to explore the number and characteristics of programs or schools that would pass and fail under an outcome-based accountability system designed by the user:

- The default performance metrics in the **Program Level** accountability tab are based on Matsudaira and Turner’s proposal (see [Box 1](#) and [Box 2](#)). Users can compare the effect of using different versions of the net earnings premium metric and/or adding a school-level backstop.
- The **Institution Level** accountability tab focuses on the performance of schools. Users can select from the school-level analogues to the proposed loan repayment rate and net earnings premium or from other existing earnings and loan repayment-based outcome measures. The tool allows users to focus in on specific sectors and/or Minority Serving Institutions.

The “Descriptives” section allows users to customize visualizations to explore the distribution of accountability metrics and associations between metrics and school characteristics:

- The **Single Variable** tab provides information on the distribution of program-level outcomes for a specific accountability metric by sector, field of study, and credential level with box plots.⁵
- The **Relationship between Variables** tab provides a visualization and summary of associations between school-level accountability metrics and school characteristics, including student demographics, tuition and instructional spending, debt levels, and participation in income-driven student loan repayment plans.

We describe five insights that can be gained from the visualization tool to illustrate its potential uses.

Five insights from the visualization tool

1. **Undergraduate certificate program outcomes vary substantially, both across and within fields and credential levels.**

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5. Box plot “whiskers” indicate enrollment weighted performance at the 5th and 95th percentiles. The top and bottom of the box are the 25th and 75th percentiles of performance. The horizontal line inside the box indicates the 50th percentile of performance. Missing whiskers indicate that two of the percentiles have the same value.

Figure 1 displays a scatter plot produced in the program level accountability tab, focusing on a subset of undergraduate certificate programs. Different fields of study are delineated by colors and institutional sectors are distinguished by the shape of the markers. Hovering over a marker will display the specific program’s field, sector, and performance. In this case, the specific Allied Health undergraduate certificate program is located in a public institution. This program has a net earnings premium of over \$6,000 which means that, after accounting for expected out-of-pocket costs, former students can expect to earn approximately \$6,000 more per year than the typical high school graduate in the same state as the institution. Three years after leaving, students who borrowed to attend the program have reduced their aggregate student loan balances by close to 17 percent.

Figure 1. Performance of Selected Undergraduate Certificate Programs



Notes: Screenshot from the Program Level Accountability tab of the [visualization tool](#). Schools in the lower left quadrant (negative loan repayment rate and net earnings premium) are classified as “failing” in the summary table (Figure 2). Below the scatter plot is a table summarizing the performance of undergraduate certificate programs in the selected fields. The final row of the table shows the performance of all undergraduate certificate programs. As shown in Figure 2, across all sectors, 12.4 percent of undergraduate certificate-seeking students attended failing programs.

The remaining columns of the summary table show the average performance of “failing” and “passing” programs for each of the selected metrics. Three years after leaving a failing program, borrowers saw their student loan balances increase by over 3 percent (Figure 2, second column). Former students earned almost \$3000 less per year than the typical high school graduate after accounting for the out-of-pocket cost of enrollment (Figure 2, 3rd column). In contrast, borrowers who attended passing programs reduced their loan balances by close to 4 percent and had net earnings exceeding \$8,000, on average.

Limiting to public institutions (using the dropdown menu at the top of the page) would show that among students in Allied Health programs offered by public institutions, only 4.6% attended failing programs, and there

are no failing computer and information sciences (CIS) undergraduate certificate programs in public institutions. In contrast, selecting only the for-profit sector would show that 14.3% of Allied Health enrollment and 5% of CIS students are in failing programs.⁶

Figure 2: Summary of Undergraduate Certificate Program Performance

Program of Study	Percent of Enrollment in Programs that are Failing	Average Loan Repayment Rate for Failing Programs	Average Loan Repayment Rate for Passing Programs	Average NEP for Failing Programs	Average NEP for Passing Programs
Allied Health	10.5%	-2.5%	2.2%	-\$1,315	\$7,958
Business	13.1%	-3.3%	1.6%	-\$1,732	\$11,581
Computer & Information Sciences	2.7%	-3.4%	3.1%	-\$4,423	\$13,872
Education	51.4%	-5.9%	9.4%	-\$5,263	\$4,964
Personal & Culinary Services	37.3%	-3.4%	6.0%	-\$5,253	-\$3,282
All Undergraduate Certificate Programs	12.4%	-3.1%	3.8%	-\$2,993	\$8,325

Notes: Screenshot from the Program Level Accountability tab of the [visualization tool](#). A program’s loan repayment rate equals the fraction of a cohorts’ total loan balances measured at the date the cohort enters repayment that has been repaid 3 years later, where negative values indicate that the cohort’s aggregate balance has increased. See [Box 1](#) for details. Schools with a negative loan repayment rate and negative net earnings premium are classified as “failing”; remaining programs are classified as “passing”.

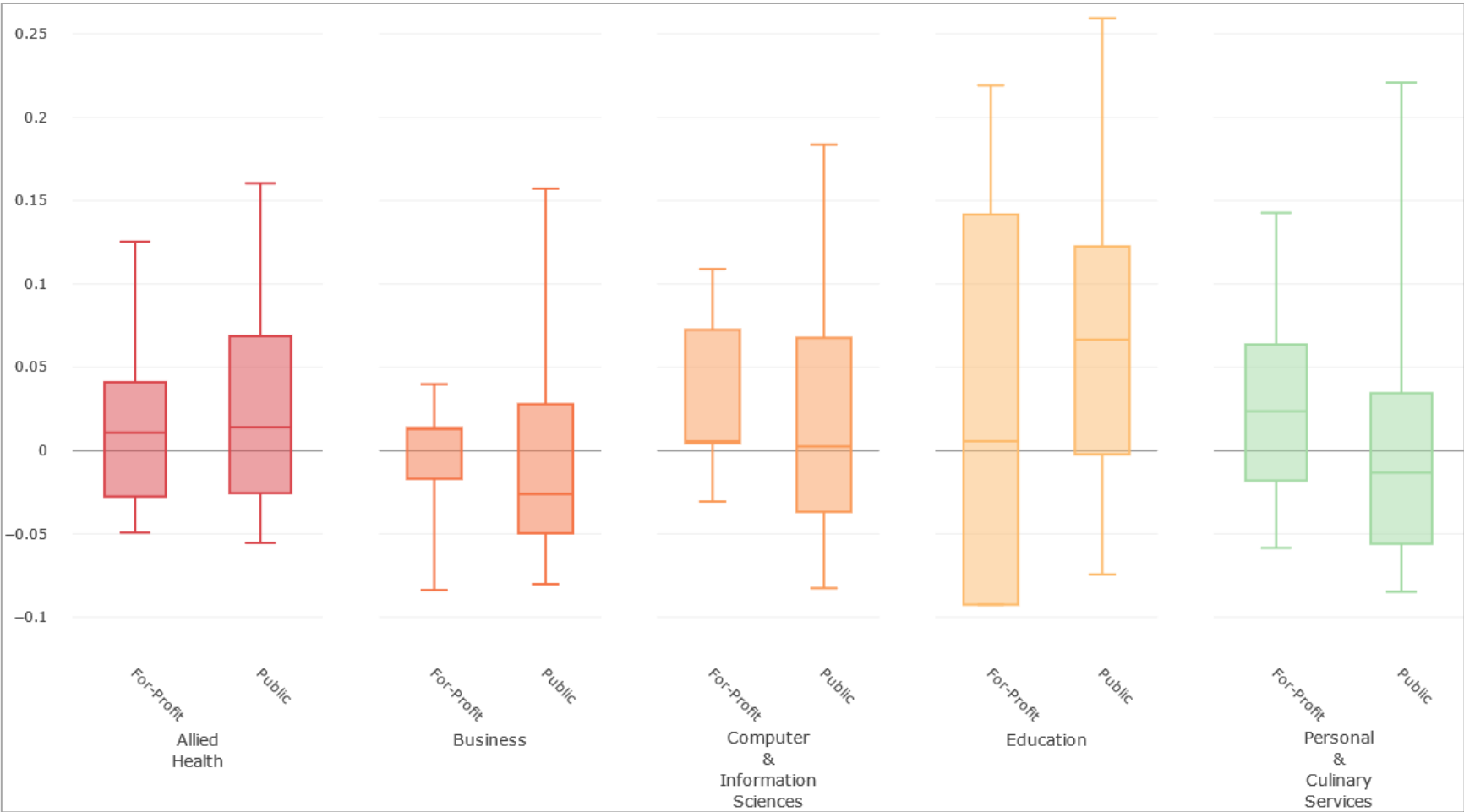
The Single Variable Descriptives tab illustrates how these averages mask a wide range of performance on each metric. [Figure 3](#) shows box and whisker plots for the loan repayment metric, focusing on the same set of programs in for-profit and public institutions. The top and bottom of each box represents the 75th and 25th percentiles of loan repayment within the field, sector, and credential level. The line in the middle of the box is the median; in this case, the loan repayment rate for a specific field-sector combination where half of all certificate programs perform better and half perform worse. The whiskers indicate the 5th and 95th percentiles.⁷

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6. There are very few undergraduate certificate programs in nonprofits; 24% of Allied Health students in this sector attend failing programs.
7. Programs are weighted by enrollment. When the distribution of the selected metric is highly skewed, there are only a small number of programs within the specific sector-field-credential level combination, or program size varies substantially, the median, box, and/or whiskers may overlap (e.g., in [Figure 3](#), the median and 75th percentile of loan repayment for-profit undergraduate business certificate programs are equal).

Although [Figure 3](#) shows some overlap in loan repayment outcomes for undergraduate certificate programs, relative performance between these sectors varies by field. For example, within the for-profit sector, about half of students pursuing a certificate in education attend programs with a negative loan repayment rate compared only a quarter of students in the public sector. Within personal and culinary service certificate programs, the opposite is the case.

Figure 3: Distribution of Loan Repayment Rate for Undergraduate Certificate Programs



Notes: Screenshot from the Single Variable Descriptives tab of the [visualization tool](#). A program’s loan repayment rate equals the fraction of a cohorts’ total loan balances measured at the date the cohort enters repayment that has been repaid 3 years later, where negative values indicate that the cohort’s aggregate balance has increased. See [Box 1](#) for details.

2. Many programs that provide students with positive economic outcomes are located in schools with poor overall loan repayment.

An important consideration in the design of any higher education accountability system is whether performance should be measured at the program-level, institution-wide, or using a combination of program- and institution-level outcomes. The loan repayment rate and net earnings premium metrics proposed by Matsudaira and Turner (2020) are measured at the program-level, but both have institution-level analogues.

[Figure 4](#) shows performance of selected associate degree programs using program-level accountability metrics. Across all sectors, 10.5% of associate-degree seeking students attended programs with either a negative net earnings premium or a negative loan repayment rate ([Table 1](#)), but failure rates vary dramatically across fields of study.

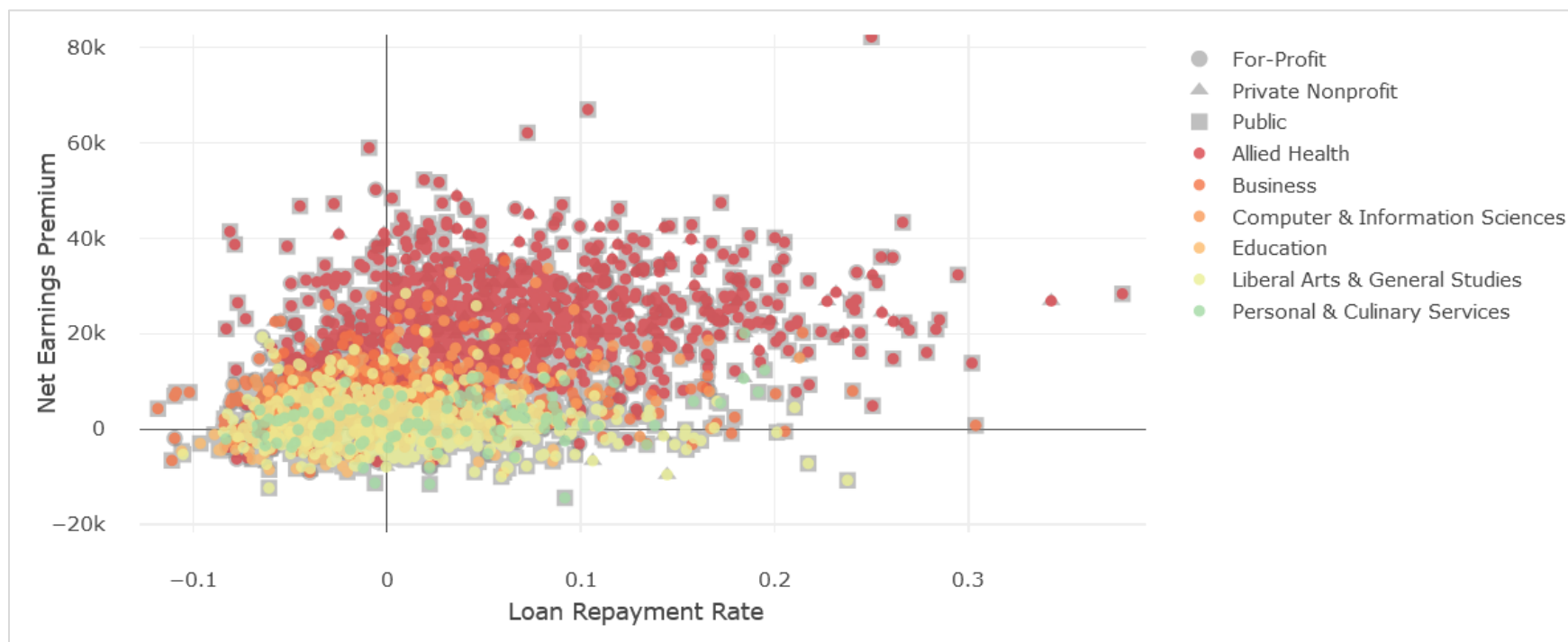
An “institutional backstop” is one way to incorporate both program and school-level performance. In this case, the goal would be to ensure that institutions that produced poor outcomes for a majority of their students face school-wide consequences. This is one way to address concerns that schools could avoid accountability-based sanctions for a period of time by closing failing programs and opening slightly different new programs.

Table 1: Percent of Associate Degree Enrollment in Failing Programs

	(1) Programmatic accountability only	Programmatic + Institutional Backstop	
		(2) School NEP	(3) School LRR
Allied Health	1.0%	2.8%	48.5%
Business	5.3%	6.1%	53.6%
Computer & Information Sciences	1.0%	1.6%	60.7%
Education	60.9%	60.9%	69.9%
Liberal Arts & General Studies	15.5%	18.2%	56.3%
Personal & Culinary Services	10.1%	11.3%	34.6%
All Associate Degree Programs	10.5%	12.4%	53.2%

Notes: LRR = loan repayment rate; NEP = net earnings premium. A program or school’s LRR equals the fraction of a cohorts’ total loan balances measured at the date the cohort enters repayment that has been repaid 3 years later, where negative values indicate that the cohort’s aggregate balance has increased. A program or school’s NEP represents the difference between median earnings of former students (measured 3 years after exit and net of out-of-pocket costs) and median earnings of high school graduates in the same state as the institution. See [Box 1](#) and [Box 2](#) for additional details. In Column 1, a program is classified as failing if it has a negative program-level LRR and negative program-level NEP. In Column 2, a program is classified as failing if it meets the criteria for Column 1 or the program is in a school with a negative school-level NEP. Column 3 uses the same definition as Column 2 except the school-level NEP is replaced by the school-level LRR.

Figure 4: Performance of Selected Associate Degree Programs



Notes: Screenshot from the Program Level Accountability tab of the [visualization tool](#). One program with a loan repayment rate (LRR) above 0.4 is excluded from scatter plot. A program's LRR equals the fraction of a cohorts' total loan balances measured at the date the cohort enters repayment that has been repaid 3 years later, where negative values indicate that the cohort's aggregate balance has increased. A program's net earnings premium equals the difference between median earnings of former students (measured 3 years after exit and net of out-of-pocket costs) and median earnings of high school graduates in the same state as the institution. See [Box 1](#) and [Box 2](#) for additional details.

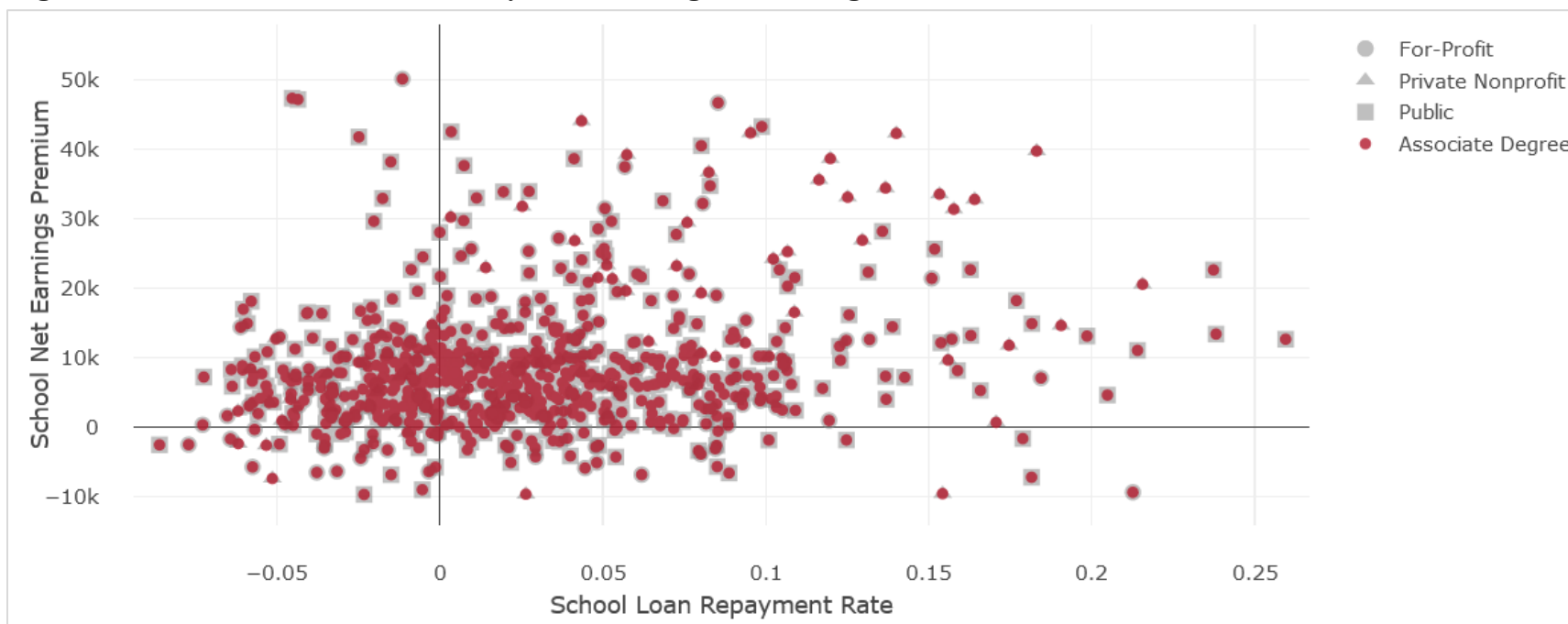
When the institutional backstop option is selected, programs with a positive loan repayment rate and/or positive net earnings premium (i.e., passing at the program-level) will still be classified as “failing” if the institution as a whole cannot meet the benchmark.⁸ For instance, Column 2 of [Table 1](#) shows the share of programs that “fail” when a school-wide net earnings premium is used as the backstop. The overall failure rate increases by 1.9 percentage points (bottom row; i.e., 12.4% - 10.5%), suggesting that only a small number of “good” programs are located in schools with poor school-wide earnings outcomes. Changes in failure rates for specific fields of student are similarly small.

Column 3 of [Table 1](#) shows how associate degree program performance would be evaluated if a school-wide loan repayment rate were used as a backstop.⁹ Discrepancies between program and school performance are much more pronounced, suggesting that many programs that yield positive economic outcomes are located in schools with poor overall loan repayment. For instance, around 42% of associate degree seeking students attend passing programs in schools with a negative loan repayment rate.

How many associate degree seeking students would be affected with a solely school-based accountability system? [Figure 5](#) shows the school-wide performance of predominantly associate degree-granting institutions. The large number of markers to the left of the y-axis shows that for many such institutions, former students struggle to make progress repaying their loans. In contrast, most predominantly associate degree granting schools also provide positive net earnings premia to their students. As a result, only 1.7% of (primarily) associate degree-seeking students would attend a failing program when accountability is based on school-wide performance (summary table, not shown).

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8. The current version of the tool only allows for one metric to be selected as an institutional backstop, but theoretically, a school could be required to “pass” earnings- and loan repayment-based metrics or “pass” one of several metrics.
 9. There are additional options for the school-level backstop: an alternative loan repayment rate, which evaluates whether the median student has paid down \$1 of their student loan principal 3 years after entering repayment, and an alternative earnings measure of whether at least half of the undergraduates who attended the institution and received federal student aid earned at least \$25,000 10 years after entering college. Both of these measures come from the [College Scorecard](#).

Figure 5: Performance of Predominantly Associate Degree Granting Institutions



Notes: Screenshot from the School Level Accountability tab of the [visualization tool](#). Two schools with school-level net earnings premia (NEP) below \$20k are excluded from visualization. A school's loan repayment rate equals the fraction of a cohorts' total loan balances measured at the date the cohort enters repayment that has been repaid 3 years later, where negative values indicate that the cohort's aggregate balance has increased. A school's NEP is equal to the enrollment-weighted average program-level NEP for all programs in the school. See [Box 1](#) and [Box 2](#) for additional details.

3. Public Minority Serving Institutions (MSIs) have similar loan repayment and earnings outcomes as other public institutions but nonprofit MSIs are twice as likely to have negative loan repayment and net earnings than nonprofit institutions as a whole.

The second tab of the visualization tool allows the user to focus on minority serving institutions (MSIs).¹⁰ Other public and nonprofit institutions are displayed in gray; no for-profit schools are classified as MSIs.¹¹ [Figure 6](#) shows that performance of MSIs largely overlaps with the performance of other public and nonprofit institutions, although MSIs are underrepresented among schools with the highest loan repayment and net earnings.

The summary tables for MSIs ([Figure 7](#), Panel A) and for all institutions ([Figure 7](#), Panel B) show that 1.5% of MSI students attended schools with a negative net earnings and loan repayment while 1.3% of all public institutions fell into this category. Average performance of “passing” and “failing” public MSIs is also similar to that of all public institutions.

In contrast, enrollment in nonprofit MSIs with negative loan repayment and net earnings is almost three times the size of enrollment in failing nonprofits as a whole (3.9% versus 1.4%, respectively). One possible explanation for this pattern is that MSIs are, on average, more expensive than the average for-profit institution. The NEP takes into account typical out-of-pocket costs and thus requires that more expensive schools produce higher earnings gains to be classified as passing. However, a similar pattern can be found when an alternative measure of student earnings that does not depend on costs – the percentage of students earning at least \$25,000 per year – is selected.

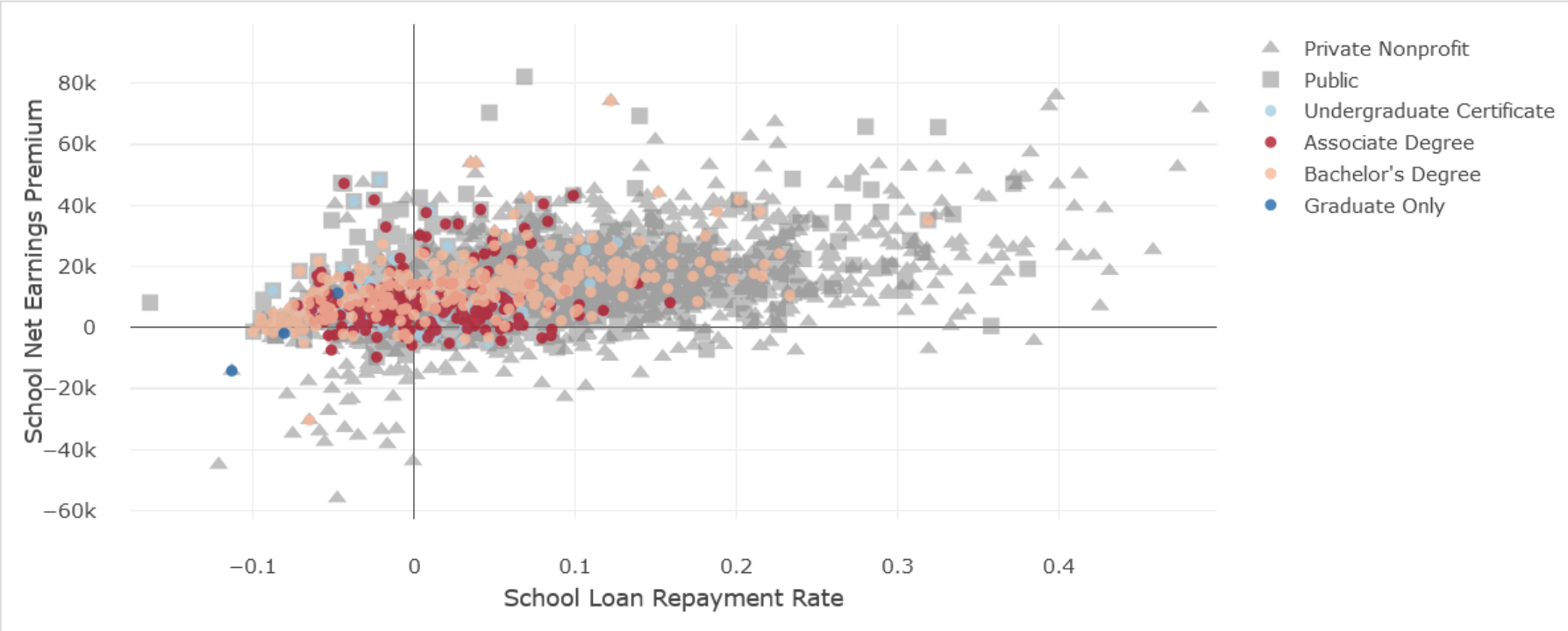
Overall, 1.7% of MSI students attend schools that would be classified as failing in an institutional accountability system based on these metrics. While this is the same as the share of all students enrolled in failing institutions (which includes for-profit students), discrepancies in failure rates within specific sectors represents an important consideration in the design of an accountability system.

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10. MSIs include Historically Black Colleges and Universities, Predominantly Black Institutions, Alaska Native and Native Hawaiian-Serving Institutions, Tribal Colleges and Universities, Asian American, Native American, Pacific Islander-Serving Institutions, Hispanic Serving-Institutions, and Native American Non-Tribal Institutions. In the analysis of program performance, a number of programs are missing a net earnings premium. We reweight programs with a nonmissing net earnings premium and loan repayment rate to be representative of enrollment in programs at the field by credential by sector level. Because of the relatively small number of MSIs programs, estimated program-level performance for MSIs will be less accurate. See Matsudaira and Turner (2020) for additional details. To avoid noisy estimates that could be misleading, we do not include the option to limit to MSI programs in the first and third tabs.

11. Double clicking on a category in the scatter plot legend will highlight particular sectors or predominant degree categories.

Figure 6: Performance of MSIs and Other Public and Nonprofit Institutions



Notes: Screenshot from the School Level Accountability tab of the [visualization tool](#). MSI = minority serving institution, which includes Historically Black Colleges and Universities, Predominantly Black Institutions, Alaska Native and Native Hawaiian-Serving Institutions, Tribal Colleges and Universities, Asian American, Native American, Pacific Islander-Serving Institutions, Hispanic Serving-Institutions, and Native American Non-Tribal Institutions. MSI institutions are indicated by the colored markers, all other public and nonprofit institutions are shown with gray markers. Six non-MSI schools with loan repayment rates (LRR) above 0.6 and net earnings premia (NEP) above \$100k are excluded from scatter plot. A school's LRR equals the fraction of a cohorts' total loan balances measured at the date the cohort enters repayment that has been repaid 3 years later, where negative values indicate that the cohort's aggregate balance has increased. A school's NEP is equal to the enrollment-weighted average program-level NEP for all programs in the school. See [Box 1](#) and [Box 2](#) for additional details.

Figure 7: Performance and Outcomes for MSIs and All Institutions

A. Minority Serving Institutions					
Type of School	Percent of Enrollment in Schools that are Failing	Average: School Loan Repayment Rate in schools that are Failing	Average: School Loan Repayment Rate in schools that are Passing	Average: School Net Earnings Premium in schools that are Failing	Average: School Net Earnings Premium in schools that are Passing
Private Nonprofit	3.9%	-4.6%	3.3%	-\$3,509	\$13,513
Public	1.5%	-3.3%	3.9%	-\$3,907	\$12,278
All Schools	1.7%	-2.8%	6.3%	-\$4,476	\$13,470
B. All Institutions					
Type of School	Percent of Enrollment in Schools that are Failing	Average: School Loan Repayment Rate in schools that are Failing	Average: School Loan Repayment Rate in schools that are Passing	Average: School Net Earnings Premium in schools that are Failing	Average: School Net Earnings Premium in schools that are Passing
For-Profit	5.4%	-3.1%	-0.3%	-\$5,012	\$9,638
Private Nonprofit	1.4%	-3.9%	11.3%	-\$11,193	\$18,740
Public	1.3%	-2.3%	5.7%	-\$2,432	\$12,537
All Schools	1.7%	-2.8%	6.3%	-\$4,476	\$13,470

Notes: Screenshot from the School Level Accountability tab of the [visualization tool](#). Minority serving institutions include Historically Black Colleges and Universities, Predominantly Black Institutions, Alaska Native and Native Hawaiian-Serving Institutions, Tribal Colleges and Universities, Asian American, Native American, Pacific Islander-Serving Institutions, Hispanic Serving-Institutions, and Native American Non-Tribal Institutions. A school’s loan repayment rate equals the fraction of a cohorts’ total loan balances measured at the date the cohort enters repayment that has been repaid 3 years later, where negative values indicate that the cohort’s aggregate balance has increased. A school’s net earnings premium is equal to the enrollment-weighted average program-level NEP for all programs in the school. See [Box 1](#) and [Box 2](#) for additional details.

4. **Students who attend institutions that spend more on instruction have better loan repayment and earnings outcomes, but the ratio of instructional spending to collected tuition revenue is not correlated with students' post-college success.**

Substantial variation in net tuition and institutional spending, as well as recent evidence of substantial spending on advertising in the for-profit sector has motivated interest in measuring and, potentially incentivizing, the ways that schools use their resources.¹² One such measure is the share of collected tuition revenue that is spent on instruction (Cheslock 2019).¹³ Recent research shows that changes in spending on academics following state budget shocks affect degree completion (Deming and Walters 2017). To the extent that students who graduate have higher earnings and net tuition revenue reflects out-of-pocket costs, the ratio of instructional spending to collected tuition revenue could be correlated with students' economic success as well. Two school-level earnings metrics are included in the tool's "Relationship between Variables" tab (under "Descriptives"): the institutional net earnings premium and the share of undergraduate federal student aid recipients earning more than \$25,000 10 years after entering college.

[Figure 8](#) displays the relationship between each earnings metric and the share of tuition revenue spent on instruction.¹⁴ For both earnings outcomes, there is little evidence of a relationship between tuition revenue spent on instruction and students' economic success.

[Table 2](#) shows the average ratio of instructional spending to tuition revenue separately by institutional control and performance for the two earnings metrics and two additional loan repayment metrics: the school-level loan repayment rate and a borrower-based loan repayment rate (i.e., whether at least 50% of borrowers had reduced their initial loan balance by at least \$1, 5 years after entering repayment). In almost every comparison, schools with positive earnings and loan repayment outcomes have lower spending as a share of tuition revenue than schools with negative earnings outcomes.

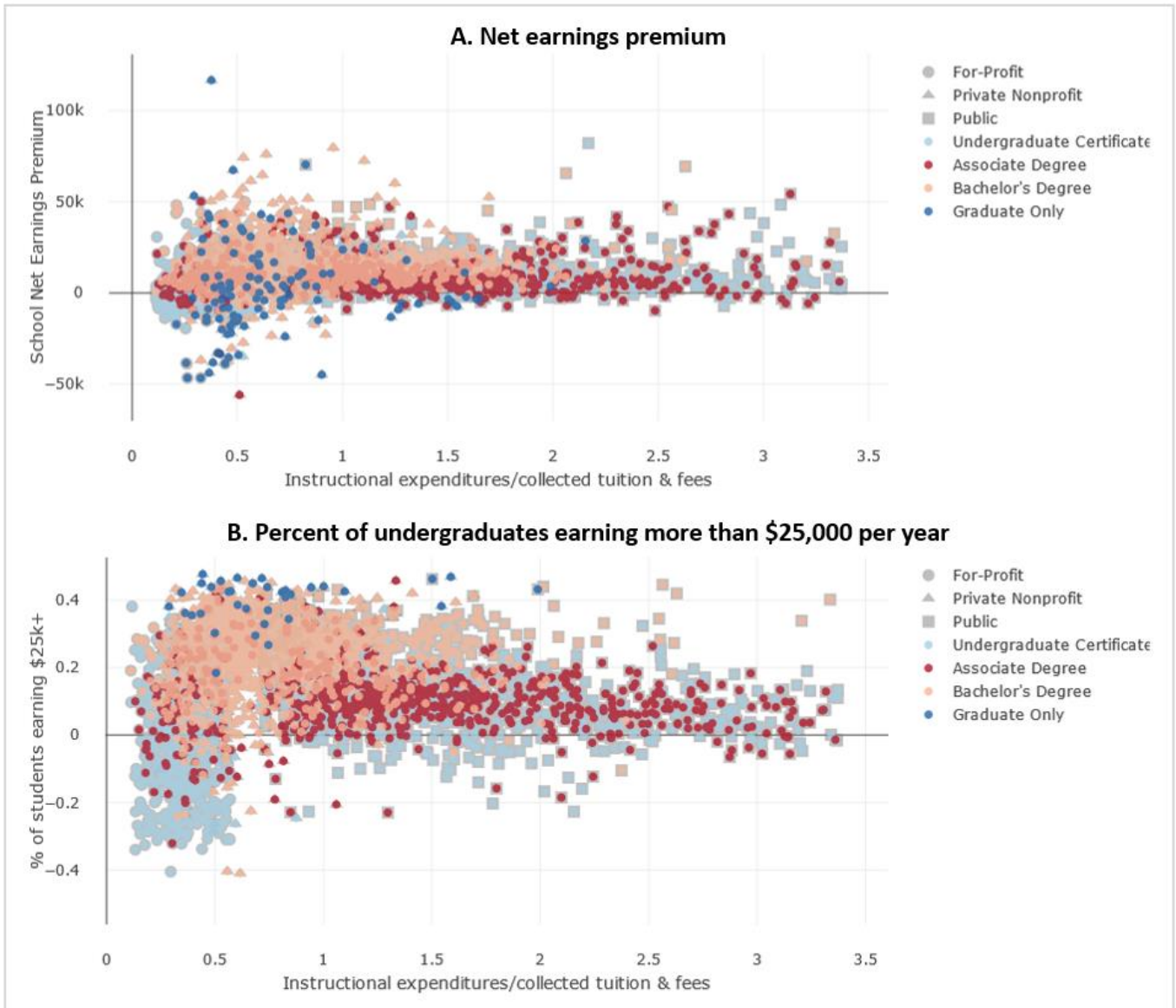
This is not to say that spending on instruction is unrelated to student outcomes. [Table 3](#) shows average per student spending on instruction for schools with positive and negative earnings and loan repayment outcomes. In almost every case, schools that produce good earnings and loan repayment outcomes also spend more per student on instruction. Differences are especially pronounced in the public and nonprofit sectors and for the loan repayment metrics.

What can be made of these two sets of results? If the aim of incorporating some measure of instructional expenditures into an accountability system is to incentivize institutional decisions that result in positive outcomes for students, focusing on per-capita spending on instruction will be more likely to achieve this aim than using the ratio of spending to collected tuition revenue. In other words, lower tuition benefits students up to a point but when it comes at the cost of lower spending on instruction, students may suffer.

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12. [Cellini and Chaudhary \(2020\)](#) report the stunning statistic that degree-granting for-profit institutions account for about 40% of all higher education advertising spending, while serving just 6% of students. Jacob, McCall, and Stange (2018) examine spending patterns of four-year public and nonprofit decisions and find that students' preferences for "consumption amenities" exerts pressure on (some) institutions to shift spending away from academics.
13. See also <https://tcf.org/content/report/much-education-students-getting-tuition-dollar/>.
14. Data on the ratio of instructional spending to collected tuition revenue was obtained from <https://tcf.org/content/report/examining-instructional-spending-accountability-consumer-information-purposes/>.

Figure 8: Earnings Outcomes and Spending on Instruction out of Tuition Revenue



Notes: Screenshot from the Relationship Between Variables (under Descriptives) tab of the [visualization tool](#). A school's net earnings premium (NEP) is equal to the enrollment-weighted average program-level NEP for all programs in the school; see [Box 2](#) for additional details. The percent of undergraduates earning at least \$25,000 per year is limited to Title IV federal aid recipients and measured 10 years after program entry; see [College Scorecard](#) documentation for details. The measure of instructional spending/collected tuition and fees was obtained from [Cheslock \(2019\)](#).

Table 2: Ratio of Instructional Spending to Tuition Revenue by Loan Repayment and Earnings Outcomes

	<u>Net earnings premium</u>		<u>At least 50% of students earn > \$25,000</u>		<u>Loan repayment rate</u>		<u>At least 50% of borrowers reduced debt by \$1</u>	
	Negative	Positive	No	Yes	Negative	Positive	No	Yes
For-profit	0.6	0.3	0.5	0.3	0.3	0.3	0.3	0.1
Private Nonprofit	0.7	0.7	1.3	0.7	0.5	0.7	0.4	0.7
Public	2.1	1.5	2.3	1.6	1.9	1.5	2.0	1.3
All Schools	1.6	1.3	1.7	1.4	1.4	1.3	1.6	1.1

Notes: Each cell displays the average (enrollment weighted) ratio of instructional spending to collected tuition and fees revenue by performance on the listed metric; available in the summary table of the Relationship Between Variables (under Descriptives) tab of the [visualization tool](#). A school’s net earnings premium (NEP) is equal to the enrollment-weighted average program-level NEP for all programs in the school. The percent of undergraduates earning at least \$25,000 per year is limited to Title IV federal aid recipients and measured 10 years after program entry; see [College Scorecard](#) documentation for details. A school’s loan repayment rate equals the fraction of a cohorts’ total loan balances measured at the date the cohort enters repayment that has been repaid 3 years later, where negative values indicate that the cohort’s aggregate balance has increased. The share of borrowers reducing their debt by at least \$1 is measured 5 years after the cohort entered repayment; see [College Scorecard](#) documentation. The measure of instructional spending/collected tuition and fees is from [Cheslock \(2019\)](#).

Table 3: Average Per-Student Spending on Instruction by Loan Repayment and Earnings Outcomes

	<u>Net earnings premium</u>		<u>At least 50% of students earn > \$25,000</u>		<u>Loan repayment rate</u>		<u>At least 50% of borrowers reduced debt by \$1</u>	
	Negative	Positive	No	Yes	Negative	Positive	No	Yes
For-profit	\$4,371	\$3,256	\$4,029	\$3,650	\$2,934	\$4,394	\$3,223	\$5,053
Private Nonprofit	\$11,655	\$14,745	\$5,286	\$14,885	\$6,199	\$16,026	\$5,006	\$15,882
Public	\$6,069	\$8,311	\$5,761	\$8,143	\$5,145	\$9,203	\$5,366	\$10,300
All Schools	\$6,458	\$9,144	\$5,183	\$9,218	\$4,813	\$10,522	\$4,982	\$11,800

Notes: Each cell displays average (student-weighted) spending on instruction and related activities per full-time equivalent student; available in the summary table of the Relationship Between Variables (under Descriptives) tab of the [visualization tool](#). A school’s net earnings premium (NEP) is equal to the enrollment-weighted average program-level NEP for all programs in the school. The percent of undergraduates earning at least \$25,000 per year is limited to Title IV federal aid recipients and measured 10 years after program entry; see [College Scorecard](#) documentation for details. A school’s loan repayment rate equals the fraction of a cohorts’ total loan balances measured at the date the cohort enters repayment that has been repaid 3 years later, where negative values indicate that the cohort’s aggregate balance has increased; see [Box 1](#) for details. The share of borrowers reducing their debt by at least \$1 is measured 5 years after the cohort entered repayment; see [College Scorecard](#) documentation.

5. While there is a negative correlation between Income-Drive Repayment (IDR) and loan repayment (measured by the share of borrowers reducing their balances or the cohort’s reduction in its aggregate balance), the IDR take-up rate does not explain all the variation in loan repayment. Other factors affect loan repayment rates. Indeed, borrowers in many institutions with high IDR take up are making progress repaying their loans.

A potential concern with using a loan repayment rate metric is the increasing take-up of income-driven repayment (IDR) plans, which link borrowers’ loan payments to their income and set loan payments to \$0 when income falls below a certain level.¹⁵ For borrowers with low income, this potentially will extend the length of repayment and make harder for borrowers to make progress towards reducing their balance in the years immediately after entering repayment. That being said, under the three most popular IDR options, the federal government covers a portion of unpaid interest when the borrower’s required payment is not sufficient to cover both principal and interest in the initial three years of repayment.¹⁶ If loan repayment rates merely reflect IDR take-up rather than measuring whether the debt taken on to attend a program is commensurate with expected earnings, then it would not fulfill the principal that an accountability metric should represent an unambiguously good outcome for students ([Box 3](#)).

The “Relationship between Variables” (under “Descriptives”) tab of the tool allows the user to visualize the relationship between institutional accountability metrics and characteristics of students and schools, including the percent of borrowers in an IDR plan. [Figure 9](#) shows that for-profit and nonprofit schools with a negative loan repayment rate have higher average take-up of IDR than those with a positive repayment rate. IDR take-up is similar for the two groups when it comes to public institutions.

The scatter plots in [Figure 10](#) also show that IDR participation and loan repayment are negatively correlated.¹⁷ IDR take-up is increasing in degree-level and the correlation between loan repayment rates and IDR participation is strongest among predominantly bachelor’s degree granting institutions. Additionally, IDR participation rates are notably higher among students who attended institutions that only offer graduate degrees, which is consistent with graduate students comprising a disproportionate share of IDR participants.¹⁸ Nonetheless, at both high and low IDR participation rates there is a wide range of institutional performance on the loan repayment metric.

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15. See, for example, <https://www.brookings.edu/blog/brown-center-chalkboard/2016/07/11/the-tension-between-student-loan-accountability-and-income-driven-repayment-plans/> and <https://www.americanprogress.org/issues/education-postsecondary/reports/2018/07/10/453199/getting-repayment-rates-right/>.

16. Specifically, 100% of subsidized loan interest is covered for borrowers in REPAYE, PAYE, and IBR. Borrowers in REPAYE will also have half of the unpaid interest on unsubsidized loans for this period. However, borrowers must recertify their income each year to continue to participate in IDR and those who fail to do so will have any unpaid interest capitalized into their loan principal. See <https://studentaid.gov/manage-loans/repayment/plans/income-driven/questions> for additional details.

17. As a point of comparison, there is little to no relationship between IDR participation and earnings outcomes. In fact, public and for-profit institutions with positive earnings outcomes have a higher IDR participation rate than those with poor earnings outcomes. IDR take-up is relatively similar for nonprofit institutions with good and bad earnings outcomes.

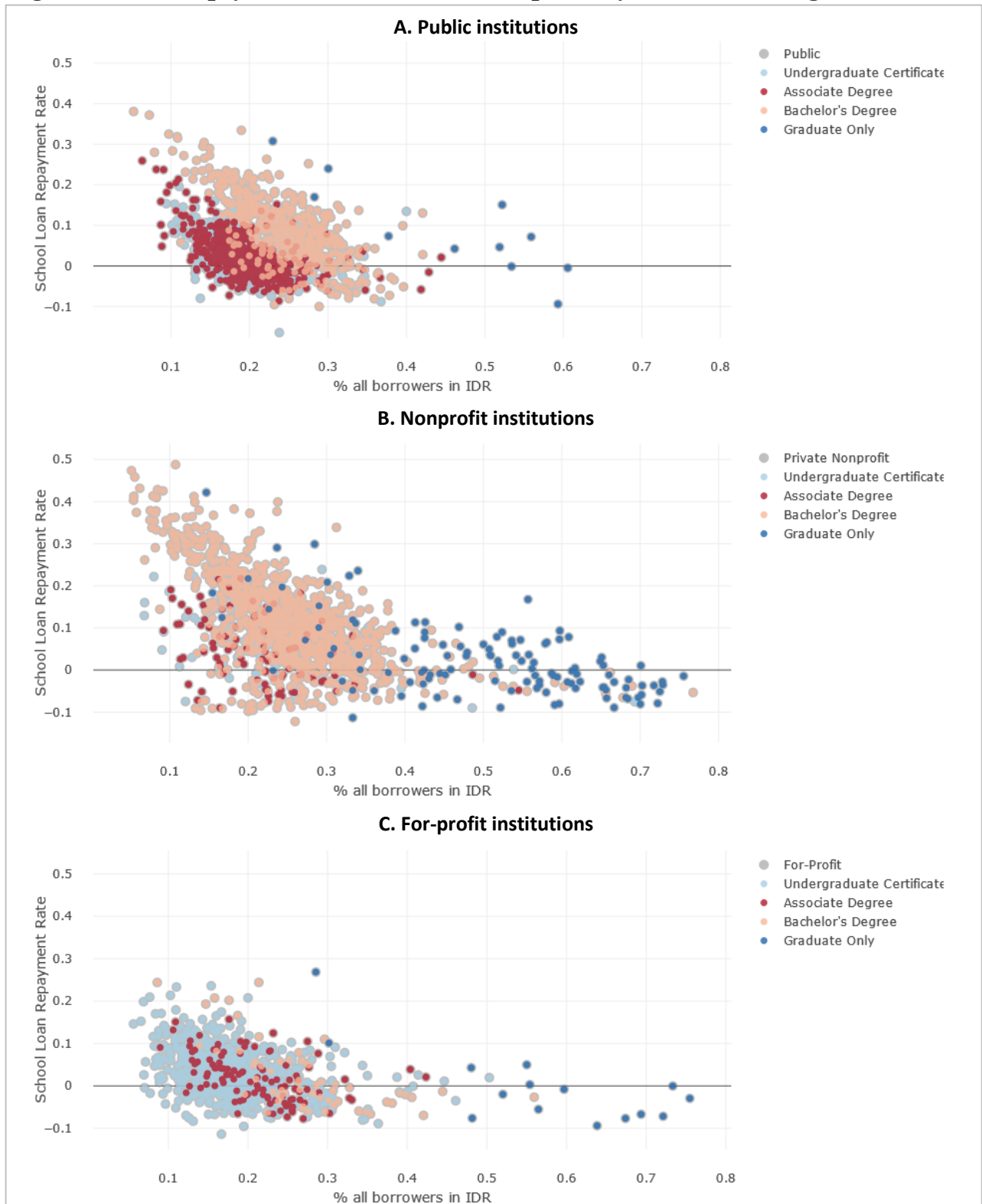
18. See <https://www.cbo.gov/publication/55968>.

Figure 9: Loan Repayment Rates and Income-Driven Student Loan Participation

Type of School	Percent of Enrollment in Schools with a Negative School Loan Repayment Rate	Average School Loan Repayment Rate in Schools with a Negative School Loan Repayment Rate	Average School Loan Repayment Rate in Schools with a Positive School Loan Repayment Rate	Average % all borrowers in IDR in Schools with a Negative School Loan Repayment Rate	Average % all borrowers in IDR in Schools with a Positive School Loan Repayment Rate
For-Profit	65.1%	-3.4%	5.2%	28.6%	18.5%
Private Nonprofit	15.0%	-2.9%	13.5%	32.0%	25.1%
Public	26.0%	-2.4%	8.5%	22.7%	21.5%
All Schools	27.2%	-2.6%	9.4%	24.9%	22.2%

Notes: Screenshot from the Relationship Between Variables (under Descriptives) tab of the [visualization tool](#). A school’s loan repayment rate equals the fraction of a cohorts’ total loan balances measured at the date the cohort enters repayment that has been repaid 3 years later, where negative values indicate that the cohort’s aggregate balance has increased; see [Box 1](#) for additional details.

Figure 10: Loan Repayment Rates and IDR Participation by Predominant Degree



Notes: Screenshots from the Relationship Between Variables (under Descriptives) tab of the [visualization tool](#). A school's loan repayment rate equals the fraction of a cohorts' total loan balances measured at the date the cohort enters repayment that has been repaid 3 years later, where negative values indicate that the cohort's aggregate balance has increased; see [Box 1](#) for details.

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