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# An Analysis of Academic School Spending in Higher Education

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Academic schools, such as colleges and their constituent departments within larger universities, are increasingly being expected to increase revenues and reduce expenditures in a challenging financial environment. Yet relatively little is known about schools' resource allocation decisions. In this research, I used detailed personnel spending data from HelioCampus to examine personnel expenses per student credit hour and credential produced by academic schools and spending patterns on administrative functions. I also analyzed where schools reduced personnel numbers during difficult budgets, and cuts disproportionately fell on non-faculty members and those focused on key administrative responsibilities.

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# An Analysis of Academic School Spending in Higher Education

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**Keywords:** Academic schools; resource allocation; budget cuts; administrative spending

**Abstract:** Academic schools, such as colleges and their constituent departments within larger universities, are increasingly being expected to increase revenues and reduce expenditures in a challenging financial environment. Yet relatively little is known about schools' resource allocation decisions. In this research, I used detailed personnel spending data from HelioCampus to examine personnel expenses per student credit hour and credential produced by academic schools and spending patterns on administrative functions. I also analyzed where schools reduced personnel numbers during difficult budgets, and cuts disproportionately fell on non-faculty members and those focused on key administrative responsibilities.

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American higher education institutions are facing a challenging financial environment as pressures grow on both the revenue and expenditure sides of the ledger. Tuition revenue is the single largest revenue source for private nonprofit colleges and second to only state appropriations for public institutions, but real net tuition revenue has declined over the past several years in both sectors (Kelchen et al., 2024). This decline has been driven by a ten percent drop in higher education enrollment since the Great Recession (National Center for Education Statistics, 2023b), rising tuition discount rates (McCreary, 2025), and a growing number of states implementing tuition freezes at public universities (Kelchen, 2025a).

Increases in state funding largely halted in Fiscal Year 2026 (State Higher Education Executive Officers Association, 2026), while the federal government's actions on federal research funding, financial aid, and international student enrollment have scrambled the finances of previously thriving research universities (Levine, 2026). The cost of providing a college education has risen faster than the rate of inflation over most of the past several decades (Commonfund Institute, 2025), and is now rising faster than increases in institutional revenues.

To deal with these financial pressures, institutions are encouraging academic units to be both innovative and efficient. Historically, this has taken the form of growing enrollment and launching new academic programs (e.g., Kelchen & Barrett, 2026; McClure & Titus, 2018). But universities are increasingly reviewing their academic portfolios for programs with low enrollments or few graduates, sometimes driven by pressure from legislators such as in Indiana and Utah (Dutton, 2025; Klemann, 2026) and sometimes to help reduce budget deficits such as in West Virginia and Nebraska (Gardner, 2025). Institutions are also encouraging revenue growth and cost control through the use of incentive-based budget models such as responsibility center

management (RCM) that give their schools and colleges a share of the profits that they generate (Strauss & Curry, 2002).

Prior research has shown that there is substantial variation in the delivery costs of different academic programs both within and across schools, and that both instructional and non-instructional costs contribute toward total delivery costs (e.g., Altonji & Zimmerman, 2019; Conger et al., 2010; Hemelt et al., 2021; Middaugh et al., 2003). These studies have contributed to the field's understanding of differences in delivery costs, which is important as students have gradually shifted from lower-cost humanities and social sciences programs into higher-cost STEM and professional programs (National Center for Education Statistics, 2023a); this has further stressed institutional budgets.

However, there are several key areas that have not been addressed in previous research in understanding factors associated with delivery costs. One is a deep examination of a variety of non-instructional expenditures, which is particularly salient due to concerns about "administrative bloat" that are often levied by critics both inside and outside of academia (e.g., American Council of Trustees and Alumni, 2021; Ginsberg, 2011). While expenses on items such as student services and advising have been shown to improve student success (Griffith & Rask, 2016; Webber, 2012), research is needed that gets into more nuanced expenditure categories such as facilities, information technology, and research administration. This also carries over to employee type, where institutions are hiring a smaller share of faculty on the tenure track and turning to staff members and non-tenure-track faculty to interact more with students (Colby, 2025).

In this paper, I focus on how academic units allocate resources, particularly in challenging financial situations. As institutional budgets continue to tighten, university leaders

are wrestling with questions about whether to centralize spending in an effort to gain control and internal efficiencies versus decentralizing spending in order to allow academic units to generate additional revenue. But many of the implementation decisions fall squarely on deans and department chairs, and their strategies ultimately determine the fate of their units as well as their employees. By leveraging school-level data, I can provide insights into institutional finances that are not possible in other analyses.

I use detailed data from more than 100 universities and systems on personnel spending by functional expenditure type and employee category, student credit hours, and credential completions from HelioCampus, a higher education analytics company, to examine factors affecting delivery costs by academic school and how schools respond to budget cuts. My research questions are the following:

(1) What is the variation in delivery cost, both within and across academic schools/colleges?

(2) To what extent are differences in delivery costs driven by personnel type, administrative costs, university centralization, and/or budget models?

(3) Where do schools cut costs when budgets are cut?

## Literature Review and Conceptual Framework

Several prior studies have documented variations in the cost of producing student credit hours both within and across fields of study. The most recent examination, by Hemelt et al. (2021), used data from the Delaware Cost Study, a consortium of up to 700 four-year institutions that collected data on instructional, research, and public service expenditures before ceasing operations in 2025 due to declining participation (Office of Institutional Research and

Effectiveness, 2025).[2] They found large variations in direct instructional expenditures per student credit hour between 2000 and 2017, with electrical engineering spending nearly three times as much as math. Notably, they found that some high-salary disciplines (such as economics) compensated by teaching larger classes than other disciplines. These findings largely matched results from Middaugh et al. (2003) using earlier Delaware Cost Study data between 1998 and 2001.

Altonji and Zimmerman (2019) analyzed data from the State University System of Florida between 2000 and 2014. This dataset included both direct costs on personnel and indirect costs on functions such as academic advising, administration, financial aid, and student services. They found similar patterns in per-credit delivery costs, but also documented that the difference in total spending per graduate was only about 50% in Fiscal Year 2001. This suggests that high-cost programs are moderated somewhat by students taking courses outside of their major. They noted that average spending per student credit hour fell substantially over time, especially in high-cost fields, but this could also be a function of enrollment growing more in these fields. Increased class sizes could be a potential mechanism.

Finally, Conger et al. (2010) used data from public universities in Florida, Illinois, New York (State University of New York), and Ohio between 2002 and 2007 to document costs per student credit hour across undergraduate and graduate disciplines. At the undergraduate level, engineering and physical sciences were the most expensive while social sciences and math tended to be less expensive. Graduate costs varied substantially, with business and psychology being relatively more expensive and English and arts being relatively less expensive. The finding

[2] There is a similar data collection effort in the two-year sector, the National Community College Benchmark Project (Juhnke, 2006). However, there does not appear to have been similar peer-reviewed research focused on this dataset.

regarding the arts is of interest because arts fields were relatively expensive at the undergraduate level and relatively inexpensive at the graduate level.

The unit of analysis for my research is the academic school or college within larger institutions. This positions deans and department chairs as key decisionmakers in the resource allocation process. These individuals have varied levels of autonomy to make financial decisions, depending on institutional policies and practices. At the same time, they are also squeezed between trying to represent the interests of their faculty and staff compared to directives coming from the provost or president (e.g., Gmelch et al., 1999). This also aligns with the classic tensions in principal-agent theory (Jensen & Meckling, 1976), in which lower-level individuals are incentivized to act in the best interest of the organization while navigating unit-level goals or incentives that may differ.

One proxy for allowing midlevel administrators to make decisions is the presence of RCM budget models, which nearly tripled in prevalence among public universities to 68 universities between 2013 and 2023 (Kelchen, 2024). Research among early RCM adopters shows some evidence that RCM can increase the number of degrees awarded (Jaquette et al., 2018; Rutherford & Rabovsky, 2018). However, it is unclear whether this increase in productivity occurs due to increased spending, potentially redirecting resources from administrative functions or the classroom, or being able to unlock potentially controversial efficiencies such as larger class sizes or using more adjuncts.

Based on prior research and theory, I hypothesize that academic schools will undertake efforts to limit administrative spending within their own units in order to reallocate resources to meet key objectives. However, this is likely moderated by RCM budget models, which provide incentives for units to duplicate services offered centrally or by other units in an effort to capture

additional revenue (Fethke & Policano, 2019). I also expect that academic schools will attempt to protect core academic functions as much as possible during difficult budget situations, but that it will be difficult to do so because of growing expectations to cut lower-performing programs and the sheer size of the instructional portion of the budget in most academic units.

## Sample, Data, and Methods

To examine questions about how academic schools allocate resources, I used proprietary data from HelioCampus that contains information on personnel spending and credit hour/credential production across more than 100 universities between Fiscal Years 2020 and 2024. The following section contains details of my sample, data, and methods.

### Sample

These analyses are based on data provided by HelioCampus (Helio), a higher education analytics company that was launched from the University of Maryland Global Campus in 2015. Helio provides labor cost analytics and decision support resources to a broad swath of primarily four-year public universities and systems. Data on spending by academic units started to be frequently collected in Fiscal Year 2020, and the analytic panel runs between 2020 and 2024. One hundred and twelve universities and systems participated in Helio's Labor Cost Analytics consortium at some point between Fiscal Years 2015 and 2024, of which 104 provided data between 2020 and 2024.

Of the 154 unique institutions (at the IPEDS UnitID level, excluding special-focus institutions and system offices), 112 are public four-year institutions as measured by 2021 Carnegie basic classifications. Appendix 1 provides summary statistics on enrollment, finances, and bachelor's degree offerings for all Helio institutions, Helio public universities, and non-

Helio public universities.[3] In general, Helio public universities tend to be larger research universities with more institutional resources and larger STEM programs than other public universities.

**Data**

My analyses pull from Helio's database of $190 billion in salary expenses (excluding benefits) between Fiscal Years 2020 and 2024. Helio standardizes payroll and human resource data across institutions (HelioCampus, 2025), allowing institutions to benchmark their personnel spending to other universities and identify areas of spending that may merit additional scrutiny. There are four key areas of standardization that I used in my analyses.

The first was the *standard school*, which groups units within universities into similar categories. Helio has 32 separate standard schools in its classification, and I collapse two types of schools into larger categories. Eight of the schools consist of auxiliary enterprises and central administration functions that do not generate student credit hours or produce degrees; I collapse these into a "non-academic" school. Seven other schools (research centers, library, online education, satellite campuses, community colleges, agricultural extension, and decentralized other) perform academic functions, but either span multiple academic units or have primary functions outside of generating student credit hours. I combined these into an "academic other" school.

This resulted in a total of 18 schools. In certain analyses, I further collapsed these schools into three types based on the prevalence of certain degree levels. Five schools (dentistry, law,

[3] I am unable to exclude the eight institutions that stopped providing data prior to 2020 from this table, as I was not provided with a list of institution names and years of participation for confidentiality reasons.

medicine, pharmacy, and veterinary) primarily offered professional doctorates, and I classified them in a doctoral-dominant category. Five other schools (architecture, education, nursing, public health, and social work) had between one-third and three-fourths of their credentials awarded at the graduate level, and I classified them in a graduate-dominant category. The other schools (agriculture, arts and sciences, business, engineering, fine arts, journalism, science, and academic other) all granted at least 70 percent of credentials at the undergraduate level; I considered them to be undergraduate-dominant.

The second area of standardization was *functional expenditures*. Helio uses a Standard Activity Model (SAM) that uses a range of metrics consistent with activity-based costing (e.g., Soares et al., 2016) to divide employees' workload into functional areas based on job titles, position descriptions, and conversations with human resources departments. This allows for an examination of administrative expenses within academic schools, as individuals in a human resources office within a school are classified under the human resources function instead of under academics. Additionally, faculty members with appointments that span multiple functions, such as department chairs, have their workload split between their different roles. Helio provides salary and full-time equivalent (FTE) employee numbers for 12 categories of interest: academics, administrative student employees, athletics, communications, development, facilities, finance, general administration, human resources, information technology, research administration, and student services.[4] In certain analyses, I combined the 11 non-academic expenditures category into a single unit to examine the intensity of administrative spending.

[4] HelioCampus also has an "excluded" category within SAM that I omit from my analyses. Within academic schools, some examples of job titles that are excluded are extension agent (agriculture), child development teacher for an on-campus school (education), clinical nurse (medical), and veterinary assistant (veterinary).

*Centralization* represented the third key area of standardization in the Helio data, based on an organizational classification matrix. All spending at the school level is classified as being centralized or decentralized, with decentralized spending being the largest category. At the university level, there are small amounts of spending on external labor, shared services and system labor; I classified these as centralized spending based on conversations with the Helio data team.

Finally, Helio standardized *employee categories* in a way that allows for comparisons across universities. Helio has ten categories, which I consolidated into seven: administrative faculty, graduate students, non-faculty, non-tenure-track faculty (lecturers and clinical or extension faculty), research employees (research faculty, postdoctoral scholars, and professional researchers), tenure-line faculty, and a group of unknown classification that I excluded from analyses (which are disproportionately temporary employees and external labor).

Helio also collected data on a number of institutional characteristics that provide context about the universities and systems in the dataset and can be used as covariates in regressions. Key time-variant metrics include information about institutional budget models (RCM, hybrid, or incremental), FTE enrollment, the share of undergraduate students, per-FTE expenditures, personnel share of total expenditures, research expenses, tuition reliance (tuition's share of total revenue), the tuition discount rate, and funds raised. Helio collects some of these variables from member institutions, while others come from the Integrated Postsecondary Education Data System (IPEDS), the National Science Foundation's Higher Education Research and Development (HERD) survey, and the CASE Voluntary Support of Education survey.

Table 1 provides institution-level summary statistics of the dataset between Fiscal Years 2020 and 2024. The median institution spends just under half of its budget on personnel

expenses, with median expenditures per FTE student of approximately $42,000. Approximately one-quarter of institutions have a RCM or a hybrid budget model, with the other half using an incremental approach. Three-fourths of spending is decentralized, with the mean and median institutions reporting nearly identical shares. The average share of credentials awarded in the catchall academic other category was 44%, with arts and sciences (17%) and business (14%) being the next two largest.

[INSERT TABLE 1 HERE]

**Methods**

To answer the first research question, I use descriptive statistics to examine personnel costs per credit hour and per credential. The Helio data included nonzero values for the number of credit hours delivered for 1,338 of the 2,700 school/year observations, as relatively few institutions reported credit hours in earlier years of the panel. To augment the sample, I estimated the number of credit hours through running regressions based on data provided on the number of credentials completed by type (certificates, associate degrees, bachelor's degrees, master's degrees, and doctoral degrees) and school fixed effects. I removed 32 observations where predicted credit hours were negative, resulting in an analytic sample of 2,668 school/year observations. When actual credit hours were available, I used the actual data instead of the regression-estimated value for credit hours; the actual and estimated results were correlated at a high rate (0.918). Completions were mapped by Classification of Instructional Programs (CIP) codes to schools using a standard organization model to ensure consistency across institutions.

I estimated personnel costs per credential in two different ways. My preferred estimate is a cost per weighted credential measure that accounts for the length of the credential and the

typical share of credit hours delivered within that school (lower for bachelor's degrees than master's and doctoral degrees). I used a weight of 0.25 for undergraduate or graduate certificates, 0.5 for associate degrees (which were infrequent in the sample), 1.0 for bachelor's and master's degrees, and 2.0 for doctoral degrees. As an alternative specification, I also used an unweighted cost metric that gave each credential equal weight regardless of the length of the credential.

For the second research question (factors associated with differences in personnel costs per credit hour and credential awarded), I ran blocked panel regressions with year and school fixed effects and institution-clustered standard errors. The first block included time-variant institution-level characteristics only, combining RCM and hybrid budget models into one category due to the lack of variation over time in RCM adoption among sample universities. The second block added three school-level characteristics: the non-academic share of personnel spending, the percentage of credentials awarded at the graduate level, and (logged) FTE employees, and the third block added in the percentage of salary on employee categories (with tenure-line employees as the reference group). As a robustness check, I ran the full regression with dummy variables for doctoral-dominant and graduate-dominant schools instead of using school-level fixed effects.

To examine the third research question, I began by identifying school-level observations in which overall personnel expenditures decreased (n=572) versus there being no change or an increase in personnel spending (n=2,389). I then descriptively explored the frequency of cuts in the number of FTE employees by SAM/functional expenditure area and the type of employee. Finally, I ran regressions similar to those in the second research question to identify factors associated with cuts in FTE employees by functional expenditure and employee type, focusing

on the model with all covariates while adding indicators for university-level cuts to operating expenses and school-level cuts to personnel spending in the regressions.

## Limitations

There are no publicly available data sources that combine school-level personnel and credit/credential production data across institutions in multiple states, making the Helio data the best possible data source to explore these research questions. However, there are some important limitations of the dataset that are worth keeping in mind while considering the results. The first limitation is that institutions are opting into purchasing HelioCampus services and participating in the benchmarking consortium. Appendix 1 shows that Helio campuses are predominantly large public research universities, but it is also possible that participating universities are more inclined to pursue cost control strategies than other universities; this could potentially limit the generalizability of the findings.

HelioCampus focused its early efforts on understanding and controlling non-academic costs, meaning that data on student credit hour and credential production was not collected in the late 2010s and student credit hour data were missing in part of the early 2020s. After purchasing ABC Insights, an organization that developed its own higher education benchmarking consortium, in 2020 (Kelly, 2020), Helio expanded its efforts to include spending on academics. The Helio dataset tracks personnel spending (salaries) only because of its focus on labor cost analytics. As a result, my estimates of delivery costs per credit hour and per credential understate the true cost of providing an education as non-personnel expenses and benefits costs are excluded. However, Helio data account for non-instructional expenses in a way that most other data sources do not include, allowing for analyses of administrative costs at the school level.

The Helio data do not allow for costs and credit hours or credentials to be linked to individual faculty members. This means that I cannot disaggregate delivery costs by credential level to examine the extent to which graduate education is more expensive than undergraduate education, which has been established in prior research (Conger et al., 2010). I attempt to partially account for this using a cost per weighted credential measure that effectively weighs graduate and doctoral degrees higher on a per-credit hour basis. Finally, I am unable to include information on state-level governance or political characteristics that could potentially influence how academic leaders make decisions. This is an important area for future research, but was not possible given the anonymized nature of the dataset.

## Results

Before getting into the core research questions, I present data on how academic schools allocate resources. Table 2 highlights the distribution of personnel spending by academic school and functional expenditure category. Overall, institutions in the Helio consortium spent 50.8% of all personnel expenditures on academics. However, academic schools spent between 56.6% (veterinary) and 85.8% (arts and sciences) on academics, while non-academic units spent just 3.6% on academic personnel. The descriptive data suggest that health-oriented fields of study spent a smaller share of their overall budget on academics compared to other fields.

[INSERT TABLE 2 HERE]

Non-academic expenditures were distributed across a range of functional expenditure categories, with student services and general administration typically being the top two categories for most schools. Student services spending ranged from 2.0% (science schools) to 9.3% (law schools), while spending on general administration varied from 2.5% (engineering) to

5.2% (law). There was relatively little variation in fields such as HR (0.6%-1.4%), finance (1.7%-2.9%), and development (0.3%-1.7%). In every case, spending on non-academic categories was a smaller proportion of overall personnel budgets for academic schools compared to the non-academic category. These gaps were especially large in fields such as student services, facilities, and information technology, which represented more than ten percent of non-academic units' spending.

Table 3 shows the distribution of personnel spending by academic school and employee category alongside the share of total budgets spent by each school. Combining academic schools (73.3% of total spending) and non-academic units (26.7% of total spending), 37% of spending was on faculty members across tenure-line, non-tenure-track, and administrative faculty positions. But there is a substantial amount of variation across units. Business (46.7%) and arts and sciences schools (44.1%) spent the most on tenure-line faculty, while dental (16.7%) and medical schools (17.8%) spend the least among academic schools.

[INSERT TABLE 3 HERE]

Nursing (37.1%) and dental schools (30.3%) spent the most on non-tenure-track faculty due to a relatively heavy usage of clinical faculty, while agriculture (7.0%) and engineering schools (7.8%) spent the least. Science, engineering, arts and sciences, and agriculture schools allocated more than ten percent of personnel on graduate students, while architecture, dental, journalism, and law schools spent at least ten percent on administrative faculty. Research spending varied considerably across schools, with agriculture and pharmacy schools spending sixteen percent and fine arts and business schools spending just one percent of their personnel budget in this area.

Turning to the first research question, Table 4 shows the distribution of personnel costs per credit hour by academic school alongside the percentage of credentials awarded at the undergraduate level. I present results using both actual data on the number of credit hours (available for about half of all observations) and estimating missing values based on the number of credentials awarded; the general pattern of results was largely similar across both methods. Across all academic units, the median cost per credit hour was $422 using actual data and $433 using actual and estimated data. To provide a comparison, Hemelt et al.'s (2021) estimate of instructional personnel spending per credit hour equated to approximately $311 in 2024 dollars at research-intensive universities. However, given that Hemelt et al.'s (2021) estimate excluded non-instructional spending and was based on a more undergraduate-focused sample (75% of degrees awarded were undergraduate, compared to 54% in my sample), the numbers are generally similar.

[INSERT TABLE 4 HERE]

There is a tremendous amount of variation in personnel costs per credit hour, both within and across academic schools. The spread between the 25$^{th}$ and 75$^{th}$ percentiles ranged between $263 and $757 using actual data only, and the difference between the 10$^{th}$ and 90$^{th}$ percentiles was nearly tenfold ($185 versus $1,517). Arts and sciences schools had the lowest median cost per credit ($206), with business, journalism, and fine arts also being below $300 per credit. These schools all had tighter interquartile ranges, with differences between the 25$^{th}$ and 75$^{th}$ percentiles being modest ($157 to $290 for arts and sciences; $197 to $330 for business).

On the high end, dental, academic other, veterinary, and medical schools all had costs over $1,000 per credit hour. The median delivery cost for medical schools was $3,161 per credit, with an interquartile range between $1,544 and $13,969. Professional doctorate programs in the

health sciences had the highest per-credit costs, with fields such as public health, social work, law, and nursing having costs of between $400 and $800 per credit. Appendix 2 provides estimates that omit a category of "excluded" personnel costs in the Helio system that consist primarily of academic healthcare and outreach expenses. This drops the median cost per credit from $422 to $405, but drops costs in health science fields by about one-fourth. However, these fields are still much more expensive than all others.

Table 5 shows personnel costs per credential awarded, both unweighted and weighted to give doctoral degrees more weight and certificates less weight than bachelor's and master's degrees. The median cost per unweighted credential was $38,512, slightly higher than the median cost per weighted credential of $35,828. The dispersion between the 25$^{th}$ and 75$^{th}$ percentiles ($21,534 to $69,465 for unweighted credentials) and between the 10$^{th}$ and 90$^{th}$ percentiles ($14,171 to $179,538) was broader than the cost per credit hour, although this narrows somewhat when examining costs per weighted credential.

[INSERT TABLE 5 HERE]

The least expensive credentials to generate were in journalism ($14,042) and business ($17,211), and there was relatively little variation in delivery costs in these fields of study across universities. Education, social work, academic other, and nursing clustered between approximately $25,000 and $30,000 per credential even with per-credit delivery costs that were higher than fields such as fine arts and arts and sciences. After adjusting for the lengths of credentials, law schools spent just over $30,000 per weighted credential. On the other hand, medical schools spent a median of $1.02 million per unweighted credential and $508,000 per weighted credential. This does not appear to be solely driven by research expenditures or clinical

practice, and instead looks like a high-cost delivery model. Veterinary, dental, and agricultural schools all had median costs per credential exceeding $100,000.

To examine Research Question 2, I ran a series of blocked regressions to see which variables were significantly associated with delivery costs. I first used (logged) per-credit delivery costs by academic school as the outcome of interest, running four different model specifications. As shown in Table 6, the first model that included university-level characteristics found no factors that were statistically significant. Adding three school-level variables (the non-academic share of spending, the share of credentials awarded at the graduate level, and the number of FTE employees) in the second model substantially increased the model's predictive power. The non-academic share of academic spending negatively influenced delivery costs (likely due to limited spending on academics instead of excessive spending on non-academic items), while the (logged) number of FTE employees was strongly associated with higher costs.

[INSERT TABLE 6 HERE]

The third model added in the percentage of salary on types of employees (such as non-faculty or non-tenure-track faculty) at the school level. These variables were not significant and slightly reduced the R-squared value, and this also made the non-academic share of school spending variable no longer significant. In the final model, I removed school fixed effects and replaced them with indicators for whether schools were doctoral-dominant or graduate-dominant (with bachelor's-dominant as the reference group). These two indicator variables were associated with higher per-credit delivery costs, and the percent of salary on non-tenure-track and research faculty at the school level became positive and significant. However, the R-squared value of the regression dropped substantially.

Table 7 uses the same blocked regression setup as Table 6, but with (logged) costs per weighted credentials produced as the outcome of interest. The same set of variables generally were significant across all four models, and I focus on the results from the second and third models because of the higher R-squared values. Factors associated with higher costs include the percent of undergraduate enrollment, decentralized spending share, per-FTE expenditures, and funds raised at the university level as well as school-level FTE employment, and the share of credentials awarded by that school at the graduate level. The non-academic share of spending at the school level was negatively associated with credential costs, meaning that institutions that devoted a larger share of spending to items other than academics actually spent less per credential than institutions that tried to limit spending more to core academic functions after holding other variables constant.

[INSERT TABLE 7 HERE]

As a robustness check to these two analyses, I ran the third model from Tables 6 and 7 separately for the three clusters of schools (doctoral-dominant, graduate-dominant, and undergraduate-dominant), with costs per credit and weighted credential as the outcomes (Appendix 3). The sole variable that was consistent across all models is that the number of FTE employees within a school was associated with higher delivery costs. Interestingly, the presence of a RCM or hybrid budget model was associated with higher per-credential costs in graduate-dominant schools and lower per-credential costs in undergraduate-dominant schools.

To answer the third research question, I started by showing the changes in FTE personnel numbers by functional expenditure area and employee type when school-level personnel spending decreased. As shown in Table 8, roughly twenty percent of observations featured a spending cut, even though the period of study and universities included in the sample represent

an unusually strong picture of university finances. When schools' budgets were cut, academics was the most frequent area to face personnel cuts (80.5% of observations). This is not surprising given that academic units spend approximately two-thirds of their budget on academic employees.

The general administration category was cut almost as frequently (79.8%), but the median change was a sharper cut (9.5% compared to 5.0% for academics). Notably, the cuts were driven by the departmental support component of general administration, while executive leadership, institutional leadership, and legal functions were cut far less often within academic schools. Administrative student employees and finance also saw reductions in employee FTEs in more than 70% of budget cuts, with the former group facing deep cuts (median change of -19.7%). On the other hand, research administration, human resources, and development FTEs were only cut in about 60% of overall budget cuts, with median changes being cuts of three to four percent.

[INSERT TABLE 8 HERE]

Examining by employee type, non-faculty employees were much more likely to face cuts than any other area (cut in 87% of cases, with the median change being a 9.6% cut). Tenure-line faculty were cut in 75% of budget cuts, followed by non-tenure-track faculty (69.4%) and graduate students (64.1%). Administrative faculty (61.1%) and research faculty (60%) were the two groups that faced the fewest cuts during overall personnel spending reductions. This shows that unit-level leadership is making strategic decisions on what to cut and what to attempt to preserve during difficult times.

Even when total personnel spending increases, a substantial number of schools still reduced FTE employment in certain fields in order to offer other employees raises or to make strategic hires in other areas. The number of employees working in general administration fell in 54.4% of observations with budget increases; this was driven by cuts to departmental support (56.6% of observations) instead of executive leadership (cuts in only 30% of observations). Finance (47.1%) and development (45.9%) were the next most frequently cut categories. Academics was least frequently cut (30.5%), but that is still a nontrivial share of observations. Turning to employee types, tenure-line faculty were the most likely to face cuts in good budget years, with FTE reductions happening in 46.1% of observations. Non-faculty were the least likely to be cut (30.5%), which is the exact opposite of what happened in observations with budget cuts.

I then ran regressions looking at factors associated with cuts in FTE employees by functional expenditure category within each academic school (Table 9). The only variable that is consistent across all categories is that cuts to school-level personnel spending predict cuts in the number of FTE employees. Higher shares of non-academic spending at the school level make cuts to administrative student employees, facilities, and general administration less likely, while the number of FTE employees in a school does not consistently predict cuts.

[INSERT TABLE 9 HERE]

RCM or hybrid budget models decrease cuts in finance and student services, while increasing cuts in administrative student employees. A university-level cut in operating expenses was only significant for administrative student employees, and this relationship was negative. Appendix 4 repeats the analyses separately for doctoral-dominant, graduate-dominant, and undergraduate-dominant programs. The only consistent finding across the three types of

programs is with cuts to personnel spending. Some metrics, such as the relationship between institutional fundraising and information technology spending, moved in opposite directions for different types of programs.

A similar story of generally inconsistent findings was true when looking at employee types. As Table 10 shows, overall cuts to personnel spending strongly predicted cuts in each FTE employee type. Increased amounts of fundraising were associated with a higher likelihood of cuts for graduate students and research employees, but a lower likelihood for non-faculty and tenure-line faculty. Being more reliant on tuition to fund operations predicted cuts for administrative faculty, graduate student employees, and research employees. Interestingly, a university-level budget cut only predicted cuts to research employees after controlling for factors such as school-level cuts to personnel spending. Appendix 5 shows these analyses separately by groups of programs. Again, there was a consistent relationship between school-level personnel spending cuts and reductions in employee numbers across categories, but generally inconsistent findings with other variables across program types.

[INSERT TABLE 10 HERE]

## Discussion

As higher education has entered an era of relative austerity and increased levels of financial uncertainty, resource allocation decisions and efficiency efforts have taken on increased importance. Larger universities are often torn between encouraging their academic units to become entrepreneurial in an effort to increase revenue and reduce expenses and centralizing control as they try to find efficiencies and operate under one coherent version. This has increased

the importance of the role that deans and department chairs play in securing the financial stability of complex institutions.

In this work, I used a novel proprietary dataset of more than 100 universities and systems, predominantly representing large public institutions, to explore questions of how academic schools allocate resources, particularly during difficult financial times. I first documented sizable differences in personnel expenses per credit hour and credential awarded, both within and across academic schools. This largely aligns with prior work (e.g., Altonji & Zimmerman, 2019; Conger et al., 2010; Hemelt et al., 2021; Middaugh et al., 2003), although I am able to document extremely high costs for producing professional degrees in health sciences fields in a way that previous undergraduate-focused analyses have not.

The cost structure of universities is a growing concern as students have migrated from liberal arts and social sciences fields with lower educational costs to STEM and health fields with higher educational costs; this has further stretched institutional budgets. A key policy question is whether universities will be able to continue increasing the number of credentials awarded in high-cost, high-need areas while facing an increasingly difficult financial situation. Many states provide some support for these fields through enrollment or performance funding models that differentiate by field of study (Kelchen et al., 2024), and approximately half of all public universities have implemented differential tuition policies that allow for higher tuition rates in fields such as engineering and nursing (Kelchen, 2025). Yet those funds are likely insufficient to fully cover higher personnel costs per credential awarded in some fields, let alone differences in facilities expenses that are outside the reach of this dataset.

Other than the number of FTE employees in a school strongly predicting personnel costs per credit hour, no other school-level or institution-level variables consistently explained

educational costs at the per-credit level. More variables, such as per-FTE expenditures, decentralization, funds raised, and the share of undergraduate enrollment at the institution level, and a lower share of spending on non-academics at the school level, predicted costs per weighted credential produced. The school-level FTE employees metric is in part an expected finding (personnel must be paid), but is also interesting given a rampant debate in higher education about so-called "administrative bloat" (e.g., American Council of Trustees and Alumni, 2021; Ginsberg, 2011). The coefficient on higher non-academic shares of spending being associated with lower per-credential production costs should give advocates for administrative bloat some pause, although much more research is needed in this area.

There is clear evidence that the Helio sample of predominantly public universities attempt to protect certain expenditure areas and employee types during budget cuts. Academics was the unit most likely to see cuts to employee FTEs when personnel spending declined, but that is primarily due to academics being the largest area of spending for all schools. Otherwise, general administration was the most likely to be cut in both good times and bad; notably, the number of employees in general administration was cut even when budgets increased. While this represents an argument against so-called "administrative bloat," cuts were more in support than leadership positions. Research administration, HR, and development were relatively protected, although non-faculty employees were more likely to see reductions than faculty members when budgets were cut.

While department and school leaders are making strategic decisions in which areas to cut and which areas to protect, few factors consistently predict where cuts are made other than the need for school-level personnel cuts. I expected university decentralization and the presence of incentive-based budget models such as RCM to be a predictor of cuts in more administrative

functions, but they generally were not the case. This highlights the importance of examining the details of university budget models, such as the share of revenue that is dedicated to centralized support units and the tax rates under RCM systems. Collecting data on these details is difficult because many universities do not post them publicly, but it is a needed area of future study.

These findings also highlight the importance of understanding how deans and department chairs allocate resources and how these decisions interact with university-level decisionmaking. Although the field understands the importance of budgeting in these administrators' jobs (e.g., Justice, 2019; Montez et al., 2003), there is little research on how they make decisions. A rare exception is Hearn et al. (2006), who interviewed three deans at the University of Minnesota about their RCM budget model experiences. Current research on how deans and department chairs set budgets and decide where to hire and fire employees would be incredibly useful.

As universities and academic schools face financial challenges, academic program closures are likely to be an increasingly common response. My research unsurprisingly finds that academic schools most frequently reduce employee FTEs in academics when personnel budgets are cut, and there seems to be more of a willingness to terminate academic programs than the traditional response of not filling vacant positions or encouraging longstanding faculty to retire through making buyout offers. There is little research on the prevalence of academic program terminations, but it is important enough to policymakers that the Trump administration's Institute of Education Sciences issued a research contract to two evaluation firms in 2025 to examine this question (Institute of Education Sciences, 2025). It is particularly important to understand how schools make cuts and the extent to which they are associated with financial challenges compared to an effort to reprioritize resources.

Finally, my findings about how academic schools within a sample of predominantly public research universities make resource allocation decisions are from a time period of growing graduate/professional student enrollment and effectively unlimited access to student loans through the Grad PLUS program. The summer of 2026 brings new limits to federal student loans along with a requirement for programs to pass an earnings threshold in order to receive federal financial aid through the 2025 passage of the One Big Beautiful Bill Act (National Association of Student Financial Aid Administrators, 2026). These changes, combined with a 12% decline in international student enrollment in fall 2025 (Baer & Ekin, 2025), may affect how schools and universities make decisions in the future.

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**Table 1: Summary statistics of the dataset, Fiscal Years 2020-2024.**

| Characteristic | Mean | Median | (SD) | Source |
|---|---|---|---|---|
| Institutional characteristics | | | | |
| Public (pct) | 91.4 | 100.0 | (28.0) | IPEDS |
| Research university (2021, pct) | 43.1 | 0.0 | (49.6) | IPEDS |
| Reporting as a system (pct) | 17.1 | 0.0 | (37.8) | Helio |
| Has a hospital (pct) | 19.2 | 0.0 | (39.4) | Helio |
| RCM budget model (pct) | 27.0 | 0.0 | (44.5) | Helio |
| Hybrid budget model (pct) | 25.8 | 0.0 | (43.8) | Helio |
| FTE enrollment (fall) | 23,646 | 21,243 | (17,599) | IPEDS |
| Pct undergraduate | 76.3 | 78.4 | (12.9) | IPEDS |
| Overall financial characteristics | | | | |
| Per-FTE expenditures ($) | 55,389 | 41,823 | (67,122) | Calculated |
| Personnel share of expenses (pct) | 48.8 | 48.3 | (6.0) | Calculated |
| Research expenses ($mil) | 365 | 149 | (505) | HERD |
| Tuition share of total revenue (pct) | 32.9 | 28.0 | (24.2) | IPEDS |
| Tuition discount rate (pct) | 29.2 | 27.4 | (14.8) | IPEDS |
| Funds raised ($mil) | 139 | 64 | (248) | Institution files |
| Personnel share of expenses (pct) | | | | |
| Centralized | 24.5 | 23.2 | (8.1) | Helio |
| Decentralized | 72.8 | 73.8 | (8.6) | Helio |
| Shared/external/system | 2.7 | 2.1 | (2.4) | Helio |
| Share of credentials by school (pct) | | | | |
| Agriculture | 1.0 | 0.0 | (2.4) | Helio |
| Architecture | 0.4 | 0.0 | (0.8) | Helio |
| Arts and sciences | 16.5 | 18.8 | (15.2) | Helio |
| Business | 13.9 | 14.2 | (9.2) | Helio |
| Dentistry | 0.3 | 0.0 | (1.0) | Helio |
| Education | 5.2 | 3.6 | (6.9) | Helio |
| Engineering | 7.8 | 6.0 | (11.5) | Helio |
| Fine arts | 0.9 | 0.0 | (1.8) | Helio |
| Journalism | 0.9 | 0.0 | (2.4) | Helio |
| Law | 1.3 | 0.0 | (2.0) | Helio |
| Medical | 0.6 | 0.0 | (1.3) | Helio |
| Nursing | 2.6 | 0.0 | (4.7) | Helio |
| Pharmacy | 0.7 | 0.0 | (1.5) | Helio |
| Public health | 0.7 | 0.0 | (1.6) | Helio |
| Science | 2.5 | 0.0 | (5.2) | Helio |
| Social work | 1.0 | 0.0 | (2.1) | Helio |
| Veterinary | 0.2 | 0.0 | (0.5) | Helio |
| Academic other | 43.6 | 35.4 | (27.7) | Helio |
| Number of institutions/systems | | 104 | | |
| Number of observations | | 339 | | |

Notes:
(1) "Academic other" includes agriculture (extension), community college, decentralized other, library, online, research centers, and satellite campuses.
(2) All financial data are adjusted into 2024 dollars using the Consumer Price Index.

**Table 2: Distribution of personnel spending by academic school and functional expenditure category, Fiscal Years 2020-2024.**

| School | Num. univ. | Academ-ics | Admin student employees | Comms. | Devel-opment | Facil-ities | Finance | Gen. admin | HR | IT | Research admin | Student services |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Overall | 111 | 50.8 | 3.1 | 2.3 | 1.7 | 8.0 | 3.7 | 4.6 | 1.5 | 5.0 | 1.6 | 8.8 |
| Agriculture (main campus) | 26 | 75.2 | 3.1 | 1.4 | 0.5 | 3.3 | 2.3 | 3.1 | 0.8 | 1.4 | 1.9 | 2.3 |
| Architecture | 23 | 78.0 | 2.4 | 1.6 | 1.0 | 1.6 | 2.6 | 4.3 | 0.9 | 2.0 | 0.7 | 3.3 |
| Arts and sciences | 71 | 85.8 | 2.1 | 0.6 | 0.3 | 1.1 | 1.5 | 2.6 | 0.6 | 1.0 | 0.5 | 2.5 |
| Business | 94 | 79.0 | 1.5 | 1.8 | 0.9 | 0.3 | 1.7 | 3.3 | 0.8 | 1.5 | 0.2 | 6.8 |
| Dentistry | 17 | 63.8 | 0.4 | 0.8 | 0.6 | 1.5 | 2.7 | 4.4 | 1.1 | 2.1 | 1.0 | 2.1 |
| Education | 78 | 71.7 | 1.9 | 1.5 | 0.6 | 0.3 | 1.9 | 4.9 | 1.0 | 1.9 | 1.1 | 4.5 |
| Engineering | 72 | 81.1 | 3.5 | 0.9 | 0.6 | 1.7 | 1.8 | 2.5 | 0.6 | 1.8 | 1.3 | 3.3 |
| Fine arts | 27 | 74.9 | 2.8 | 1.6 | 1.0 | 1.7 | 2.3 | 3.5 | 0.8 | 1.2 | 0.3 | 3.2 |
| Journalism | 14 | 72.2 | 2.3 | 5.5 | 1.6 | 0.2 | 2.7 | 4.9 | 1.0 | 2.2 | 0.4 | 5.6 |
| Law | 44 | 70.9 | 1.7 | 2.0 | 1.7 | 0.5 | 2.7 | 5.2 | 1.0 | 1.8 | 0.2 | 9.3 |
| Medical | 38 | 66.5 | 1.2 | 0.9 | 0.6 | 0.8 | 2.4 | 3.3 | 1.4 | 2.0 | 1.8 | 2.2 |
| Nursing | 55 | 73.3 | 0.8 | 1.3 | 0.8 | 0.6 | 2.5 | 5.0 | 1.2 | 2.0 | 1.3 | 4.6 |
| Pharmacy | 32 | 76.8 | 1.4 | 1.0 | 0.6 | 0.7 | 2.1 | 3.8 | 0.9 | 1.8 | 1.4 | 3.1 |
| Public health | 26 | 73.1 | 2.5 | 1.6 | 0.5 | 0.9 | 2.5 | 4.0 | 1.4 | 2.4 | 2.2 | 4.3 |
| Science | 27 | 81.9 | 3.8 | 0.6 | 0.3 | 2.3 | 1.9 | 3.6 | 0.6 | 1.1 | 0.8 | 2.0 |
| Social work | 28 | 65.6 | 1.6 | 1.9 | 0.8 | 0.3 | 2.9 | 5.1 | 1.3 | 3.0 | 1.6 | 4.8 |
| Veterinary | 16 | 56.6 | 2.2 | 1.1 | 0.8 | 2.2 | 2.6 | 3.0 | 1.2 | 2.2 | 2.5 | 2.3 |
| Academic other | 111 | 62.7 | 2.9 | 2.1 | 0.6 | 3.0 | 2.6 | 3.8 | 0.9 | 3.5 | 1.4 | 3.6 |
| Non-academic | 111 | 3.6 | 4.9 | 4.6 | 4.2 | 20.9 | 7.3 | 7.1 | 3.2 | 11.5 | 2.8 | 19.0 |

Source: Personnel spending data from HelioCampus.

Notes:

(1) "Academic other" includes agriculture (extension), community college, decentralized other, library, online, research centers, and satellite campuses.

(2) "Non-academic" includes auxiliary enterprises, athletics, shared services, and university-wide functions that are not allocated to individual campus units.

(3) Spending on athletics and an "excluded category" (mainly, academic healthcare and outreach) are not shown here.

(4) All financial data are adjusted into 2024 dollars using the Consumer Price Index.

**Table 3: Distribution of personnel spending by academic school and employee category, Fiscal Years 2020-2024.**

| School | Num. univ. | Share of total spending (pct) | Distribution of personnel spending (pct) Admin faculty | Grad students | Non-faculty | NTT | Research employees | Tenure line |
|---|---|---|---|---|---|---|---|---|
| Overall | 111 | 100.0 | 4.2 | 4.4 | 39 | 10.9 | 4.3 | 21.9 |
| Agriculture (main campus) | 26 | 2.5 | 6.1 | 10.1 | 21.9 | 7.0 | 16.9 | 29.1 |
| Architecture | 23 | 0.4 | 10.3 | 5.8 | 18.3 | 17.6 | 3.2 | 41.2 |
| Arts and sciences | 71 | 10.4 | 5.8 | 11.9 | 12.2 | 13.2 | 5.2 | 44.1 |
| Business | 94 | 4.2 | 8.9 | 2.8 | 17.9 | 16.3 | 1.1 | 46.7 |
| Dentistry | 17 | 0.8 | 13.3 | 1.2 | 33.9 | 30.3 | 4.6 | 16.7 |
| Education | 78 | 2.2 | 7.0 | 6.3 | 26.0 | 15.4 | 4.3 | 34.3 |
| Engineering | 72 | 6.6 | 7.3 | 15.6 | 15.3 | 7.8 | 9.1 | 38.1 |
| Fine arts | 27 | 0.8 | 7.3 | 6.4 | 22.4 | 18.2 | 0.8 | 41.7 |
| Journalism | 14 | 0.3 | 11.5 | 6.8 | 23.4 | 23.6 | 11.1 | 33.4 |
| Law | 44 | 1.0 | 12.2 | 0.5 | 25.6 | 13.9 | 1.9 | 39.0 |
| Medical | 38 | 19.2 | 6.9 | 1.6 | 29.4 | 24.1 | 10.4 | 17.8 |
| Nursing | 55 | 1.2 | 8.0 | 1.5 | 24.1 | 37.1 | 3.2 | 19.7 |
| Pharmacy | 32 | 1.0 | 9.0 | 6.3 | 19.6 | 17.8 | 16.1 | 25.0 |
| Public health | 26 | 1.7 | 9.8 | 7.1 | 23.7 | 14.4 | 11.5 | 32.6 |
| Science | 27 | 2.0 | 5.1 | 15.6 | 16.6 | 10.1 | 10.0 | 37.8 |
| Social work | 28 | 0.5 | 7.9 | 4.3 | 32.3 | 19.2 | 6.9 | 25.2 |
| Veterinary | 16 | 1.3 | 6.4 | 2.7 | 36.6 | 14.8 | 7.7 | 18.9 |
| Academic other | 111 | 17.1 | 5.1 | 4.1 | 40.3 | 12.8 | 9.1 | 22.6 |
| Non-academic | 111 | 26.7 | 0.4 | 0.3 | 84.3 | 0.8 | 0.5 | 0.3 |

Source: Personnel spending data from HelioCampus.

Notes:

(1) "Academic other" includes agriculture (extension), community college, decentralized other, library, online, research centers, and satellite campuses.

(2) "Non-academic" includes auxiliary enterprises, athletics, shared services, and university-wide functions that are not allocated to individual campus units.

(3) There is an omitted category of employees that cannot be classified; these are predominantly staff and contract positions.

(4) "Research employees" includes full-time researchers and postdocs.

(5) All financial data are adjusted into 2024 dollars using the Consumer Price Index.

**Table 4: Personnel costs per credit hour by academic school.**

| | | Actual data only (n=1,338) | | | | | Missings estimated based on credentials awarded (n=2,668) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| School | Pct undergrad awards | 10th | 25th | Median | 75th | 90th | 10th | 25th | Median | 75th | 90th |
| Overall | 54.3 | 185 | 263 | 422 | 757 | 1,517 | 167 | 255 | 433 | 816 | 1,666 |
| Agriculture (main campus) | 82.7 | 265 | 532 | 703 | 1,258 | 1,596 | 231 | 359 | 609 | 1,230 | 1,767 |
| Architecture | 60.1 | 219 | 265 | 306 | 358 | 471 | 193 | 232 | 305 | 370 | 554 |
| Arts and sciences | 82.3 | 128 | 157 | 206 | 290 | 457 | 123 | 163 | 233 | 358 | 494 |
| Business | 70.0 | 161 | 197 | 252 | 330 | 480 | 158 | 196 | 246 | 325 | 436 |
| Dentistry | 6.8 | 598 | 697 | 1,122 | 1,565 | 2,055 | 653 | 784 | 1,181 | 1,668 | 1,990 |
| Education | 36.1 | 153 | 227 | 330 | 476 | 813 | 156 | 243 | 339 | 521 | 818 |
| Engineering | 70.7 | 270 | 355 | 466 | 627 | 843 | 281 | 375 | 499 | 667 | 938 |
| Fine arts | 76.5 | 208 | 238 | 267 | 364 | 673 | 201 | 228 | 267 | 400 | 827 |
| Journalism | 86.7 | 231 | 253 | 264 | 285 | 382 | 190 | 258 | 314 | 450 | 608 |
| Law | 9.0 | 437 | 587 | 730 | 987 | 1,180 | 434 | 610 | 755 | 956 | 1,180 |
| Medical | 0.0 | 847 | 1,544 | 3,161 | 13,969 | 22,204 | 913 | 1,652 | 4,060 | 13,012 | 22,443 |
| Nursing | 63.9 | 231 | 309 | 444 | 617 | 886 | 209 | 309 | 447 | 682 | 1,014 |
| Pharmacy | 13.3 | 461 | 615 | 790 | 1,814 | 6,773 | 304 | 565 | 759 | 1,368 | 2,571 |
| Public health | 45.8 | 311 | 366 | 592 | 769 | 1,823 | 125 | 311 | 494 | 690 | 1,476 |
| Science | 74.4 | 172 | 211 | 316 | 451 | 758 | 112 | 172 | 250 | 432 | 722 |
| Social work | 24.0 | 255 | 332 | 473 | 849 | 1,149 | 193 | 275 | 437 | 731 | 1,255 |
| Veterinary | 9.3 | 781 | 1,059 | 1,409 | 1,806 | 8,612 | 811 | 1,076 | 1,416 | 1,780 | 5,202 |
| Academic other | 72.3 | 407 | 622 | 1,213 | 3,284 | 7,427 | 128 | 318 | 736 | 1,394 | 3,201 |

Source: Personnel spending data from HelioCampus.

Notes:

(1) All regressions for missing values include the number of credentials by level (undergraduate certificate, associate, bachelor's, graduate certificate, master's, and doctoral) and school fixed effects.

(2) Regression-based estimates with negative costs are removed.

(3) Reported costs per credit of zero are eliminated from all observations.

(4) All costs are adjusted into 2024 dollars using the Consumer Price Index.

**Table 5: Personnel costs per credential awarded by academic school.**

| | | Costs per credential (n=2,700) | | | | | Costs per weighted credential (n=2,700) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| School | Pct undergrad awards | 10th | 25th | Median | 75th | 90th | 10th | 25th | Median | 75th | 90th |
| Overall | 54.3 | 14,171 | 21,534 | 38,512 | 69,465 | 179,538 | 14,643 | 21,475 | 35,828 | 61,153 | 131,955 |
| Agriculture (main campus) | 82.7 | 40,264 | 77,989 | 123,119 | 223,924 | 332,532 | 41,396 | 73,989 | 116,692 | 230,720 | 335,368 |
| Architecture | 60.1 | 28,077 | 34,638 | 46,909 | 70,116 | 95,605 | 28,366 | 35,634 | 47,566 | 69,907 | 95,208 |
| Arts and sciences | 82.3 | 20,172 | 24,658 | 32,601 | 41,967 | 52,790 | 21,112 | 25,744 | 33,502 | 42,259 | 55,096 |
| Business | 70.0 | 10,363 | 13,128 | 17,211 | 21,512 | 29,139 | 11,102 | 13,839 | 17,734 | 22,296 | 30,045 |
| Dentistry | 6.8 | 124,432 | 146,710 | 180,262 | 232,385 | 284,865 | 70,105 | 84,045 | 119,160 | 146,744 | 176,701 |
| Education | 36.1 | 12,085 | 16,889 | 29,692 | 46,342 | 62,633 | 13,321 | 18,559 | 29,401 | 47,141 | 62,339 |
| Engineering | 70.7 | 26,608 | 33,293 | 46,464 | 63,293 | 86,308 | 27,610 | 33,135 | 44,716 | 60,168 | 82,144 |
| Fine arts | 76.5 | 29,613 | 36,338 | 45,694 | 66,628 | 96,383 | 35,358 | 44,842 | 44,842 | 66,738 | 100,233 |
| Journalism | 86.7 | 6,414 | 10,384 | 14,042 | 18,135 | 22,052 | 6,423 | 10,056 | 14,198 | 18,116 | 22,052 |
| Law | 9.0 | 26,261 | 32,621 | 55,688 | 67,715 | 82,051 | 17,926 | 22,011 | 30,532 | 36,948 | 43,864 |
| Medical | 0.0 | 207,833 | 342,107 | 1,016,805 | 3,270,844 | 5,488,115 | 103,916 | 171,053 | 508,402 | 1,637,122 | 2,744,058 |
| Nursing | 63.9 | 12,939 | 19,730 | 30,051 | 45,160 | 66,742 | 12,596 | 19,291 | 27,018 | 39,918 | 58,168 |
| Pharmacy | 13.3 | 42,843 | 64,926 | 93,334 | 122,430 | 187,788 | 30,068 | 40,688 | 51,621 | 72,673 | 101,783 |
| Public health | 45.8 | 24,536 | 41,018 | 73,989 | 162,138 | 251,754 | 24,638 | 45,177 | 72,262 | 164,407 | 284,180 |
| Science | 74.4 | 22,583 | 35,925 | 50,140 | 65,746 | 79,408 | 22,303 | 34,071 | 46,219 | 62,301 | 73,553 |
| Social work | 24.0 | 12,541 | 17,007 | 25,301 | 41,047 | 77,939 | 12,946 | 16,883 | 24,952 | 45,901 | 80,355 |
| Veterinary | 9.3 | 144,542 | 195,006 | 259,195 | 347,318 | 463,597 | 96,515 | 112,652 | 150,464 | 182,866 | 231,798 |
| Academic other | 72.3 | 10,889 | 16,989 | 28,028 | 48,371 | 69,925 | 11,389 | 17,530 | 28,448 | 49,317 | 71,650 |

Source: Personnel spending data from HelioCampus.

Notes:

(1) In the weighted category, certificates are weighted at 0.25, associate degrees are weighted at 0.5, bachelor's and master's degrees are weighted at 1.0, and doctoral degrees are weighted at 2.0.

(2) All costs are adjusted into 2024 dollars using the Consumer Price Index.

**Table 6: Regressions identifying factors associated with (logged) per-credit delivery costs by academic school.**

| Characteristic | Model (1) | Model (2) | Model (3) | Model (4) |
|---|---|---|---|---|
| University-level characteristics | | | | |
| Non-academic share of spending (pct) | n/s | n/s | n/s | - |
| RCM or hybrid budget model (pct) | n/s | n/s | n/s | n/s |
| FTE enrollment (log) | n/s | n/s | n/s | n/s |
| Pct undergraduate | n/s | n/s | n/s | n/s |
| Decentralized share of spending (pct) | n/s | n/s | n/s | n/s |
| Per-FTE expenditures ($, log) | n/s | n/s | n/s | n/s |
| Personnel share of expenses (pct) | n/s | n/s | n/s | n/s |
| Research expenses ($, log) | n/s | n/s | n/s | n/s |
| Tuition share of total revenue (pct) | n/s | n/s | n/s | n/s |
| Tuition discount rate (pct) | n/s | n/s | n/s | n/s |
| Funds raised ($, log) | n/s | n/s | n/s | n/s |
| School-level characteristics | | | | |
| Non-academic share of spending (pct) | | - | n/s | n/s |
| Graduate credentials awarded (pct) | | n/s | n/s | n/s |
| FTE employees (log) | | +++ | +++ | +++ |
| Pct salary on non-faculty | | | n/s | n/s |
| Pct salary on NTT faculty | | | n/s | + |
| Pct salary on research faculty | | | n/s | + |
| Pct salary on other non-tenure-line employees | | | n/s | n/s |
| Doctoral-dominant school | | | | +++ |
| Graduate-dominant school | | | | +++ |
| Year fixed effects? | Yes | Yes | Yes | Yes |
| School fixed effects? | Yes | Yes | Yes | No |
| R-squared (overall) | 0.475 | 0.640 | 0.637 | 0.545 |
| Number of observations | 2,562 | 2,554 | 2,554 | 2,554 |
| Number of institutions | 97 | 97 | 97 | 97 |

Source: Data provided by HelioCampus.

Notes:

(1) +/- represents positive/negative significant at p<.05, ++/-- represents p<.01, and +++/--- represents p<.001. n/s means not significant, and blank cells mean that a variable was not included in a regression.

(2) Models also include institution-clustered standard errors.

(3) Each column is the result of a separate regression.

(4) All financial variables are adjusted into 2024 dollars using the Consumer Price Index.

(5) Doctoral-dominant schools include dentistry, law, medicine, pharmacy, and veterinary. Graduate-dominant schools include architecture, education, nursing, public health, and social work.

**Table 7: Regressions identifying factors associated with (logged) weighted per-credential production costs by academic school.**

| Characteristic | Model (1) | Model (2) | Model (3) | Model (4) |
|---|---|---|---|---|
| University-level characteristics | | | | |
| Non-academic share of spending (pct) | n/s | n/s | n/s | n/s |
| RCM or hybrid budget model (pct) | n/s | n/s | n/s | n/s |
| FTE enrollment (log) | n/s | n/s | n/s | n/s |
| Pct undergraduate | ++ | +++ | +++ | ++ |
| Decentralized share of spending (pct) | n/s | ++ | ++ | ++ |
| Per-FTE expenditures ($, log) | ++ | ++ | ++ | + |
| Personnel share of expenses (pct) | n/s | n/s | n/s | n/s |
| Research expenses ($, log) | n/s | n/s | n/s | n/s |
| Tuition share of total revenue (pct) | n/s | n/s | n/s | n/s |
| Tuition discount rate (pct) | n/s | n/s | n/s | n/s |
| Funds raised ($, log) | + | +++ | +++ | +++ |
| School-level characteristics | | | | |
| Non-academic share of spending (pct) | | - | - | --- |
| Graduate credentials awarded (pct) | | + | + | n/s |
| FTE employees (log) | | +++ | +++ | +++ |
| Pct salary on non-faculty | | | n/s | n/s |
| Pct salary on NTT faculty | | | n/s | n/s |
| Pct salary on research faculty | | | n/s | ++ |
| Pct salary on other non-tenure-line employees | | | n/s | n/s |
| Doctoral-dominant school | | | | +++ |
| Graduate-dominant school | | | | +++ |
| Year fixed effects? | Yes | Yes | Yes | Yes |
| School fixed effects? | Yes | Yes | Yes | No |
| R-squared (overall) | 0.593 | 0.689 | 0.687 | 0.538 |
| Number of observations | 2,592 | 2,592 | 2,592 | 2,592 |
| Number of institutions | 98 | 98 | 98 | 98 |

Source: Data provided by HelioCampus.

Notes:

(1) +/- represents positive/negative significant at p<.05, ++/-- represents p<.01, and +++/--- represents p<.001. n/s means not significant, and blank cells mean that a variable was not included in a regression.

(2) Models also include institution-clustered standard errors.

(3) Each column is the result of a separate regression.

(4) All financial variables are adjusted into 2024 dollars using the Consumer Price Index.

(5) Certificates are weighted at 0.25, associate degrees are weighted at 0.5, bachelor's and master's degrees are weighted at 1.0, and doctoral degrees are weighted at 2.0.

(6) Doctoral-dominant schools include dentistry, law, medicine, pharmacy, and veterinary. Graduate-dominant schools include architecture, education, nursing, public health, and social work.

**Table 8: Changes to FTE personnel numbers by changes in school-level personnel spending.**

| | Decrease in expenses (n=572) | | Increase in expenses (n=2,389) | |
|---|---|---|---|---|
| Characteristic | Cuts (pct) | Median change (pct) | Cuts (pct) | Median change (pct) |
| Functional expenditure area | | | | |
| Academics | 80.5 | -5.0 | 30.5 | 2.6 |
| Admin student employees | 77.1 | -19.7 | 35.0 | 6.8 |
| Communications | 65.2 | -5.3 | 36.5 | 4.6 |
| Development | 61.4 | -4.1 | 45.1 | 0 |
| Facilities | 66.9 | -5.6 | 44.9 | 1.2 |
| Finance | 73.4 | -6.2 | 47.1 | 0.7 |
| General administration | 79.8 | -9.5 | 54.4 | -1.5 |
| Human resources | 60.2 | -3.4 | 39.9 | 3.1 |
| Information technology | 65.8 | -3.4 | 44.3 | 1.0 |
| Research administration | 59.1 | -3.0 | 39.0 | 4.5 |
| Student services | 63.3 | -4.1 | 33.2 | 5.0 |
| Employee type | | | | |
| Administrative faculty | 61.1 | -4.0 | 43.2 | 1.1 |
| Grad students | 64.1 | -4.8 | 40.9 | 2.7 |
| Non-faculty | 87.0 | -9.6 | 30.5 | 3.7 |
| Non-tenure-track faculty | 69.4 | -5.8 | 34.5 | 3.9 |
| Research faculty | 60.0 | -4.2 | 37.4 | 4.7 |
| Tenure-line faculty | 75.0 | -4.6 | 46.1 | 0.8 |

Source: HelioCampus data.

Notes:

(1) Financial values (for decreases/increases in expenses) are not adjusted for inflation.

(2) It is possible to have an increase in nominal spending alongside a decrease in FTE personnel.

**Table 9: Regressions identifying factors associated with cuts in FTE employees by academic school.**

| Characteristic | Academ-ics | Admin students | Comms | Devel-opment | Facil-ities | Finance | Gen. admin | HR | IT | Research admin | Student services |
|---|---|---|---|---|---|---|---|---|---|---|---|
| University-level characteristics | | | | | | | | | | | |
| Cut to operating expenses | n/s | -- | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| Non-academic share of spending (pct) | + | - | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| RCM or hybrid budget model (pct) | n/s | + | n/s | n/s | n/s | --- | n/s | n/s | n/s | n/s | - |
| FTE enrollment (log) | n/s | - | n/s | n/s | n/s | n/s | + | n/s | n/s | n/s | -- |
| Pct undergraduate | n/s | n/s | n/s | n/s | -- | n/s | n/s | n/s | n/s | n/s | n/s |
| Decentralized share of spending (pct) | + | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| Per-FTE expenditures ($, log) | n/s | --- | n/s | - | n/s | n/s | n/s | - | n/s | n/s | --- |
| Personnel share of expenses (pct) | n/s | --- | n/s | - | - | n/s | n/s | - | n/s | n/s | -- |
| Research expenses ($, log) | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| Tuition share of total revenue (pct) | n/s | n/s | n/s | n/s | n/s | n/s | -- | n/s | n/s | n/s | n/s |
| Tuition discount rate (pct) | n/s | n/s | n/s | n/s | n/s | n/s | n/s | + | n/s | n/s | n/s |
| Funds raised ($, log) | n/s | - | + | + | n/s | n/s | -- | n/s | + | + | n/s |
| School-level characteristics | | | | | | | | | | | |
| Cut to personnel spending | +++ | +++ | +++ | + | + | +++ | +++ | ++ | +++ | +++ | +++ |
| Non-academic share of spending (pct) | n/s | - | n/s | n/s | --- | n/s | - | n/s | n/s | n/s | n/s |
| Graduate credentials awarded (pct) | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s | n/s |
| FTE employees (log) | n/s | n/s | n/s | + | - | n/s | n/s | n/s | n/s | n/s | n/s |
| R-squared (overall) | 0.060 | 0.023 | 0.011 | 0.001 | 0.015 | 0.003 | 0.002 | 0.008 | 0.021 | 0.018 | 0.014 |
| Number of observations | 1,839 | 1,818 | 1,828 | 1,787 | 1,662 | 1,826 | 1,839 | 1,814 | 1,685 | 1,628 | 1,834 |
| Number of institutions | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 89 | 89 | 91 |

Source: Data provided by HelioCampus.
Notes:

(1) +/- represents positive/negative significant at p<.05, ++/-- represents p<.01, and +++/--- represents p<.001. n/s means not significant, and blank cells mean that a variable was not included in a regression.
(2) Models also include institution-clustered standard errors and year and school fixed effects.
(3) Each column is the result of a separate regression.
(4) All financial variables are adjusted into 2024 dollars using the Consumer Price Index.

**Table 10: Regressions identifying factors associated with cuts in FTE employees by academic school.**

| Characteristic | Admin faculty | Grad students | Non-faculty | NTT faculty | Research employees | Tenure-line faculty |
|---|---|---|---|---|---|---|
| University-level characteristics | | | | | | |
| Cut to operating expenses | n/s | n/s | n/s | n/s | ++ | n/s |
| Non-academic share of spending (pct) | n/s | n/s | - | ++ | n/s | n/s |
| RCM or hybrid budget model (pct) | n/s | n/s | n/s | n/s | ++ | n/s |
| FTE enrollment (log) | n/s | n/s | -- | n/s | n/s | n/s |
| Pct undergraduate | n/s | n/s | n/s | n/s | n/s | n/s |
| Decentralized share of spending (pct) | n/s | n/s | n/s | n/s | + | n/s |
| Per-FTE expenditures ($, log) | n/s | n/s | - | n/s | n/s | n/s |
| Personnel share of expenses (pct) | n/s | n/s | -- | n/s | n/s | n/s |
| Research expenses ($, log) | n/s | n/s | n/s | n/s | n/s | - |
| Tuition share of total revenue (pct) | + | + | n/s | n/s | + | n/s |
| Tuition discount rate (pct) | n/s | n/s | n/s | n/s | n/s | n/s |
| Funds raised ($, log) | n/s | ++ | -- | n/s | ++ | -- |
| School-level characteristics | | | | | | |
| Cut to personnel spending | +++ | +++ | +++ | +++ | +++ | +++ |
| Non-academic share of spending (pct) | n/s | n/s | -- | n/s | n/s | n/s |
| Graduate credentials awarded (pct) | n/s | n/s | n/s | n/s | n/s | n/s |
| FTE employees (log) | n/s | n/s | n/s | n/s | n/s | n/s |
| R-squared (overall) | 0.004 | 0.012 | 0.051 | 0.008 | 0.001 | 0.018 |
| Number of observations | 1,698 | 1,597 | 1,718 | 1,712 | 1,485 | 1,704 |
| Number of institutions | 84 | 81 | 84 | 84 | 81 | 84 |

Source: Data provided by HelioCampus.

Notes:

(1) +/- represents positive/negative significant at p<.05, ++/-- represents p<.01, and +++/--- represents p<.001. n/s means not significant, and blank cells mean that a variable was not included in a regression.

(2) Models also include institution-clustered standard errors and year and school fixed effects.

(3) Each column is the result of a separate regression.

(4) All financial variables are adjusted into 2024 dollars using the Consumer Price Index.

**Appendix 1: Institutional characteristics of sample and non-sample institutions, 2023-24.**

| | All Helio institutions | | Public 4-year Helio | | Public 4-year non-Helio | |
|---|---|---|---|---|---|---|
| Characteristic | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Institutional characteristics | | | | | | |
| Public (pct) | 90.9 | (28.8) | 100.0 | -- | 100.0 | -- |
| Private nonprofit (pct) | 9.1 | (28.8) | 0.0 | -- | 0.0 | -- |
| Four-year (pct) | 81.8 | (38.7) | 100.0 | -- | 100.0 | -- |
| Carnegie research (2021, pct) | 77.0 | (42.3) | 78.6 | (41.2) | 32.3 | (46.8) |
| Student characteristics | | | | | | |
| FTE enrollment | 16,585 | (15,894) | 20,923 | (15,979) | 9,496 | (10,102) |
| Undergraduate enrollment share (pct) | 85.1 | (13.2) | 83.5 | (10.1) | 86.8 | (10.2) |
| Pell recipients (pct) | 27 | (11.0) | 27.7 | (11.1) | 38.2 | (14.7) |
| Admit rate (pct) | 69.7 | (24.3) | 72.5 | (21.3) | 78.4 | (18.1) |
| 8-year graduation rate (pct) | 60.2 | (20.9) | 65.5 | (14.8) | 55.9 | (14.5) |
| Bachelor's degrees by field (pct) | | | | | | |
| Business | 16.7 | (9.8) | 17.8 | (7.4) | 17.8 | (8.0) |
| Education | 5.4 | (7.1) | 5.5 | (5.8) | 7.2 | (7.2) |
| Health | 11.9 | (15.4) | 10.5 | (11.5) | 11.5 | (11.1) |
| Liberal arts | 16.2 | (10.5) | 15.7 | (6.3) | 17.7 | (10.0) |
| Social sciences | 14.7 | (8.6) | 14.4 | (6.5) | 14.5 | (7.3) |
| STEM | 28.9 | (20.3) | 28.7 | (17.4) | 22.0 | (14.4) |
| Revenues | | | | | | |
| Per-FTE revenue ($) | 60,290 | (67,906) | 61,417 | (57,730) | 41,884 | (37,080) |
| Tuition revenue ($, per FTE) | 12,178 | (8,666) | 11,817 | (6,062) | 7,531 | (4,285) |
| State funding ($, per FTE) | 8,825 | (9,220) | 10,492 | (10,050) | 11,037 | (8,231) |
| Endowment ($, per FTE) | 60,228 | (122,421) | 37,716 | (45,840) | 18,955 | (37,951) |
| Expenses | | | | | | |
| Per-FTE expenses ($) | 54,118 | (59,857) | 56,007 | (52,865) | 38,334 | (33,305) |
| Instruction ($, per FTE) | 16,163 | (20,581) | 14,453 | (7,992) | 11,359 | (6,487) |
| Academic support ($, per FTE) | 4,353 | (3,988) | 4,637 | (2,989) | 3,456 | (3,281) |
| Student services ($, per FTE) | 3,107 | (2,231) | 2,861 | (1,367) | 3,329 | (2,835) |
| Institutional support ($, per FTE) | 4,784 | (4,538) | 4,374 | (3,350) | 4,620 | (5,514) |
| Research ($, per FTE) | 8,490 | (18,129) | 8,717 | (14,651) | 3,025 | (6,489) |
| Number of institutions | 154 | | 112 | | 439 | |

Source: Integrated Postsecondary Education Data System.

Notes:

(1) All financial values are adjusted into 2024 dollars using the Consumer Price Index.

(2) System-level observations and special-focus institutions are excluded.

(3) A few institutions stopped participating in the HelioCampus consortium by 2020, but they cannot be separated out for this analysis.

**Appendix 2: Personnel costs per credit hour by academic school, with and without an excluded expense category.**

| | | Actual data only (n=1,338) | | | | | Costs after omitting the excluded category (n=1,338) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| School | Pct undergrad awards | 10th | 25th | Median | 75th | 90th | 10th | 25th | Median | 75th | 90th |
| Overall | 54.3 | 185 | 263 | 422 | 757 | 1,517 | 179 | 255 | 405 | 707 | 1,319 |
| Agriculture (main campus) | 82.7 | 265 | 532 | 703 | 1,258 | 1,596 | 264 | 517 | 681 | 1,135 | 1,556 |
| Architecture | 60.1 | 219 | 265 | 306 | 358 | 471 | 218 | 262 | 303 | 356 | 458 |
| Arts and sciences | 82.3 | 128 | 157 | 206 | 290 | 457 | 128 | 156 | 202 | 289 | 454 |
| Business | 70.0 | 161 | 197 | 252 | 330 | 480 | 157 | 182 | 244 | 325 | 475 |
| Dentistry | 6.8 | 598 | 697 | 1,122 | 1,565 | 2,055 | 491 | 583 | 849 | 1,207 | 1,782 |
| Education | 36.1 | 153 | 227 | 330 | 476 | 813 | 142 | 222 | 303 | 441 | 709 |
| Engineering | 70.7 | 270 | 355 | 466 | 627 | 843 | 270 | 353 | 462 | 618 | 838 |
| Fine arts | 76.5 | 208 | 238 | 267 | 364 | 673 | 195 | 218 | 255 | 325 | 585 |
| Journalism | 86.7 | 231 | 253 | 264 | 285 | 382 | 230 | 252 | 262 | 285 | 371 |
| Law | 9.0 | 437 | 587 | 730 | 987 | 1,180 | 433 | 582 | 721 | 911 | 1,171 |
| Medical | 0.0 | 847 | 1,544 | 3,161 | 13,969 | 22,204 | 816 | 1,400 | 2,567 | 11,896 | 19,645 |
| Nursing | 63.9 | 231 | 309 | 444 | 617 | 886 | 219 | 289 | 433 | 584 | 873 |
| Pharmacy | 13.3 | 461 | 615 | 790 | 1,814 | 6,773 | 458 | 561 | 714 | 1,659 | 6,315 |
| Public health | 45.8 | 311 | 366 | 592 | 769 | 1,823 | 291 | 361 | 567 | 728 | 1,725 |
| Science | 74.4 | 172 | 211 | 316 | 451 | 758 | 172 | 210 | 314 | 450 | 731 |
| Social work | 24.0 | 255 | 332 | 473 | 849 | 1,149 | 224 | 299 | 423 | 634 | 928 |
| Veterinary | 9.3 | 781 | 1,059 | 1,409 | 1,806 | 8,612 | 640 | 826 | 1,038 | 1,232 | 6,533 |
| Academic other | 72.3 | 407 | 622 | 1,213 | 3,284 | 7,427 | 381 | 602 | 1,154 | 2,795 | 6,552 |

Source: Personnel spending data from HelioCampus.

Notes:

(1) The "excluded" category primarily includes academic healthcare and outreach expenses.

(2) Reported costs per credit of zero are eliminated from all observations.

(3) All costs are adjusted into 2024 dollars using the Consumer Price Index.

**Appendix 3: Regressions identifying factors associated with (logged) weighted per-credit and per-weighted credential costs by groups of programs.**

| | Doctoral dominant | | Graduate dominant | | Mainly undergraduate | |
|---|---|---|---|---|---|---|
| Characteristic | Credits | Credentials | Credits | Credentials | Credits | Credentials |
| University-level characteristics | | | | | | |
| Non-academic share of spending (pct) | n/s | n/s | n/s | n/s | n/s | n/s |
| RCM or hybrid budget model (pct) | n/s | n/s | - | +++ | n/s | --- |
| FTE enrollment (log) | n/s | n/s | n/s | n/s | n/s | n/s |
| Pct undergraduate | n/s | n/s | n/s | +++ | n/s | +++ |
| Decentralized share of spending (pct) | n/s | n/s | n/s | n/s | n/s | ++ |
| Per-FTE expenditures ($, log) | n/s | n/s | n/s | + | n/s | n/s |
| Personnel share of expenses (pct) | n/s | n/s | n/s | n/s | n/s | n/s |
| Research expenses ($, log) | n/s | n/s | n/s | n/s | n/s | n/s |
| Tuition share of total revenue (pct) | n/s | n/s | n/s | n/s | n/s | n/s |
| Tuition discount rate (pct) | n/s | n/s | n/s | n/s | n/s | n/s |
| Funds raised ($, log) | n/s | n/s | n/s | +++ | - | --- |
| School-level characteristics | | | | | | |
| Non-academic share of spending (pct) | n/s | n/s | n/s | n/s | n/s | -- |
| Graduate credentials awarded (pct) | - | n/s | + | +++ | n/s | n/s |
| FTE employees (log) | +++ | +++ | ++ | +++ | +++ | +++ |
| Pct salary on non-faculty | n/s | -- | n/s | n/s | n/s | n/s |
| Pct salary on NTT faculty | n/s | n/s | n/s | n/s | n/s | n/s |
| Pct salary on research employees | n/s | n/s | + | n/s | n/s | n/s |
| Pct salary on other non-tenure-line employees | n/s | n/s | n/s | n/s | n/s | n/s |
| Year fixed effects? | Yes | Yes | Yes | Yes | Yes | Yes |
| School fixed effects? | Yes | Yes | Yes | Yes | Yes | Yes |
| R-squared (overall) | 0.412 | 0.807 | 0.014 | 0.440 | 0.459 | 0.596 |
| Number of observations | 493 | 497 | 693 | 694 | 1,368 | 1,401 |
| Number of institutions | 60 | 60 | 86 | 86 | 97 | 98 |

Source: Data provided by HelioCampus.

Notes:

(1) +/- represents positive/negative significant at p<.05, ++/-- represents p<.01, and +++/--- represents p<.001. n/s means not significant.

(2) Models also include institution-clustered standard errors.

(3) Each column is the result of a separate regression.

(4) All financial variables are adjusted into 2024 dollars using the Consumer Price Index.

(5) Certificates are weighted at 0.25, associate degrees are weighted at 0.5, bachelor's and master's degrees are weighted at 1.0, and doctoral degrees are weighted at 2.0.

(6) Doctoral-dominant schools include dentistry, law, medicine, pharmacy, and veterinary. Graduate-dominant schools include architecture, education, nursing, public health, and social work.

**Appendix 4: Regressions identifying factors associated with cuts in FTE employees by academic school and groups of programs.**

| Characteristic | Academics | Admin student employees | Comms | Devel-opment | Facil-ities | Finance | Gen. admin | HR | IT | Research admin | Student services |
|---|---|---|---|---|---|---|---|---|---|---|---|
| University-level characteristics | | | | | | | | | | | |
| Cut to operating expenses | | ---G | -G | | +U | | | | | +U | |
| Non-academic share of spending (pct) | +D | | | +G | ---D | | --D | -G | -G | -G | -U |
| RCM or hybrid budget model (pct) | +G | +++G | ---G | | | ---U | +G | ++G | | | |
| FTE enrollment (log) | -G | --D | -G | | | --U | | +G | -G | | ---U |
| Pct undergraduate | | | | | -GU | | | | | | -G |
| Decentralized share of spending (pct) | +G | | | | -D | | +G | +G | | | |
| Per-FTE expenditures ($, log) | | ---D, -U | --G | -D | | | | --G | ---G | | ---U |
| Personnel share of expenses (pct) | | --D | | | --U | -U | | -DG | -G | | ---U |
| Research expenses ($, log) | | | | | -D | | | ++G | -U | | |
| Tuition share of total revenue (pct) | | | +D | | +U | | -DU | | | | |
| Tuition discount rate (pct) | +G | +U | +DG | | | +G | | +++G | +D | | |
| Funds raised ($, log) | | -U | -G, +++U | +D, ++U | | -G, +U | ---DG | ++DG | ---D, +++G, +U | +++G | +GU |
| School-level characteristics | | | | | | | | | | | |
| Cut to personnel spending | +++DGU | ++DGU | +++GU | +D | +D | -G, ++U | ++G, +++U | ++U | ++D, +U | +++G, +U | +++U |
| Non-academic share of spending (pct) | | | -G | | -DGU | | -D | --G | | --D | |
| Graduate credentials awarded (pct) | ++D | | | | | | -G | | | | |
| FTE employees (log) | | | | +U | | | -D | | | -D | -U |

Source: Data provided by HelioCampus.

Notes:
(1) +/- represents positive/negative significant at p<.05, ++/-- represents p<.01, and +++/--- represents p<.001. D represents doctoral-dominant (dentistry, law, medicine, pharmacy, and veterinary), G represents graduate-dominant (architecture, education, nursing, public health, and social work), and U represents undergraduate-dominant (all others).
(2) Models also include institution-clustered standard errors and year and school fixed effects.
(3) Each column is the result of a separate regression.
(4) All financial variables are adjusted into 2024 dollars using the Consumer Price Index.

**Appendix 5: Regressions identifying factors associated with cuts in FTE employees by academic school and groups of programs.**

| Characteristic | Admin faculty | Grad students | Non-faculty | NTT faculty | Research employees | Tenure-line faculty |
|---|---|---|---|---|---|---|
| University-level characteristics | | | | | | |
| Cut to operating expenses | | | | | +D, ++U | |
| Non-academic share of spending (pct) | ++G | | | ++U | | +D, ++G |
| RCM or hybrid budget model (pct) | | | --U | +++G | +++D | |
| FTE enrollment (log) | | -G | --D, -G | | | |
| Pct undergraduate | | | | | | |
| Decentralized share of spending (pct) | | | --D | | +G | |
| Per-FTE expenditures ($, log) | | | -DU | -D | | |
| Personnel share of expenses (pct) | | | --U | -D | | |
| Research expenses ($, log) | -D | | | | | --G |
| Tuition share of total revenue (pct) | +GU | +++G | | ++G | ++D | |
| Tuition discount rate (pct) | +G | | ++D | | | |
| Funds raised ($, log) | ---G | +++G | ---D | | +++G | --U |
| School-level characteristics | | | | | | |
| Cut to personnel spending | +G, +++U | +++GU | +++DGU | +++DG, ++U | ++G, +U | ++D, +++GU |
| Non-academic share of spending (pct) | | | ---G, -U | | | |
| Graduate credentials awarded (pct) | | | | | | |
| FTE employees (log) | | | | | | |

Source: Data provided by HelioCampus.

Notes:

(1) +/- represents positive/negative significant at p<.05, ++/-- represents p<.01, and +++/--- represents p<.001. D represents doctoral-dominant (dentistry, law, medicine, pharmacy, and veterinary), G represents graduate-dominant (architecture, education, nursing, public health, and social work), and U represents undergraduate-dominant (all others).

(2) Models also include institution-clustered standard errors and year and school fixed effects.

(3) Each column is the result of a separate regression.

(4) All financial variables are adjusted into 2024 dollars using the Consumer Price Index.