

Higher Education Finance: Expenditures & Costs

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Higher Education
College Finance

Introduction

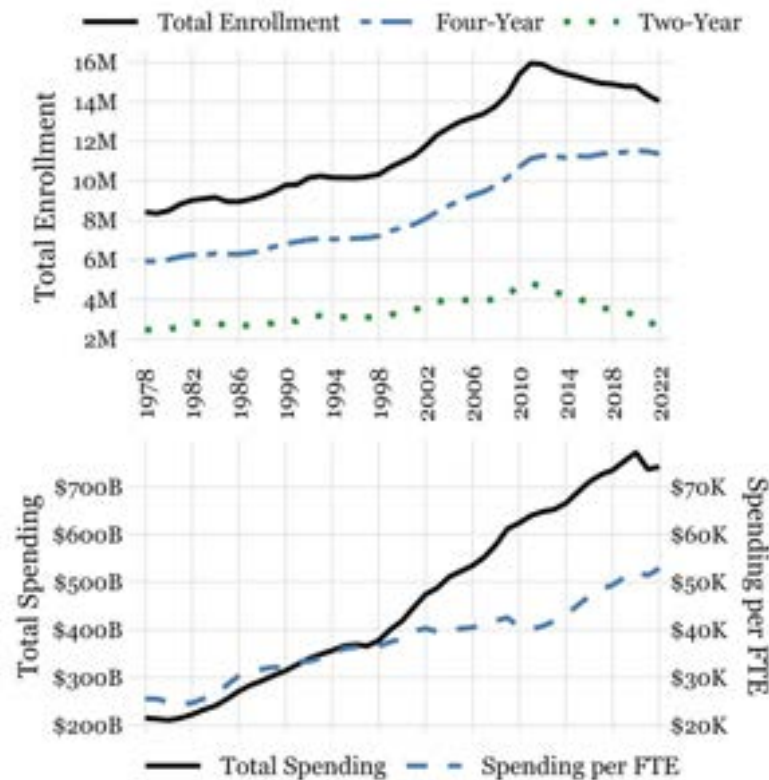
Expenditures for U.S. higher education institutions totaled \$712 billion in 2021–22. These expenditures encompass a range of institutional costs related to educational activities, including instruction, student services, and campus facilities. Postsecondary institutions have varying missions, resulting in different core costs and expenditure patterns. Community colleges primarily focus on instruction, while large universities also conduct research, provide housing, and engage in public service. These institutional costs influence, but are distinct from, published tuition prices and net costs paid by students and families.¹

All levels of government—federal, state, and local—contribute to higher education revenues, each with distinct roles. Federal funds primarily support student financial aid, while state and local governments provide direct appropriations to public colleges and universities. Higher education is the fourth-largest state budget category, averaging 8.5% of direct state and local spending.² Differences in state policies, revenue sources, and overall funding levels influence institutional budgeting and spending decisions year over year.

In recent decades, total expenditures for higher education have steadily increased, both in aggregate and per full-time equivalent (FTE) student. Since the Great Recession, total spending has risen due to growing operational and personnel costs. At the same time, enrollment has stagnated or declined, significantly increasing expenditures per student (Figure 1). State funding has fluctuated substantially, with many states reducing their support for public institutions after each recent recession. As a result, the share of the total costs paid by students and families for public higher education has also grown over time.

Critics argue that rising costs in U.S. higher education have led to tuition increases and mounting student debt and that stagnant or declining enrollments make the current spending trajectory unsustainable. There is also concern that the steady rise in spending is inefficient, driven by administrative bloat, and does little to improve student outcomes. Conversely, advocates argue that supporting the financial stability of postsecondary institutions is essential for maintaining quality, access, and innovation in higher education. However, critics and advocates agree on the need to improve degree completion rates without substantially increasing costs through the strategic allocation of public resources.



Figure 1. Postsecondary Enrollments and Institutional Spending, 1978-2022

Notes: Title IV degree-granting institutions, FTE = full-time equivalent; expenditures in constant 2023 dollars. Sources: NCES Digest of Education Statistics: 2023 Digest Tables 334.10, 334.50; 2011 Digest Tables 377, 379, 381; 2009 Digest Tables 336, 364; 2006 Digest Table 348; 2001 Digest Table 343. Missing NCES expenditures data (fiscal years 2002/2003) imputed using data from the Delta Cost Project.

Key Findings

Key finding #1: *Postsecondary students in the U.S. experience very different levels of resources depending on where they study. While average per student institutional spending is \$32,810, this ranges widely.*

Differences in revenue sources across institutional sectors mean that specific external factors will drive spending across institutions. Public institutions rely heavily on state support; private nonprofit and for-profit institutions depend more on endowment income, tuition, and federal aid.

Key finding #2: *State higher education policies and funding structures drive the total resources available for public institutions and their revenue-generating strategies.*

Public institutions rely heavily on state appropriations, and there is substantial variation in funding mechanisms and overall levels across states. State funding cuts and volatility have prompted greater reliance on tuition and other revenue sources. States' use of tuition-control policies limits institutions' ability to increase revenues from in-state students.

Key finding #3: *Institutional spending improves student outcomes.*

One recent and credible study finds that a 10% increase in institutional spending is associated with a 3% increase in enrollment and a 6%–9% increase in awards (certificates and degrees). Spending is a crucial component of institutional "quality," with student services and amenities spending also influencing student decisions and outcomes. It is not yet clear if the effects of spending differ across different higher education sectors or instructional, research, amenity, or other spending categories.

Key finding #4: *Resource use also varies within institutions, across departments and programs due to institutional policies and the resources required.*

Some fields are nearly twice as expensive as others to teach due to differences in input prices and how well instruction can scale while maintaining quality. Some institutional and state-level practices, such as responsibility-centered management, differential pricing, and cost-based appropriations, likely magnify these differences.

Key finding #5: *Federal financial aid and research funding influence institutional behaviors and spending.*

Federal student aid indirectly sustains institutional spending by subsidizing and providing liquidity for students to pay institutions tuition and other educational costs. Federal funding subsidizes over half of all university research spending.

Key finding #6: *Efforts to substantially rein in institutional spending have been unsuccessful because costs are an ingredient of educational quality.*

Longstanding efforts to reduce institutional costs have confronted the reality that spending buys institutional quality and prestige, and cost escalation may be inevitable in service industries whose primary input is skilled professional staff. Institutions and policymakers may have more success at reducing spending per graduate by improving completion rates and economizing time to degree.

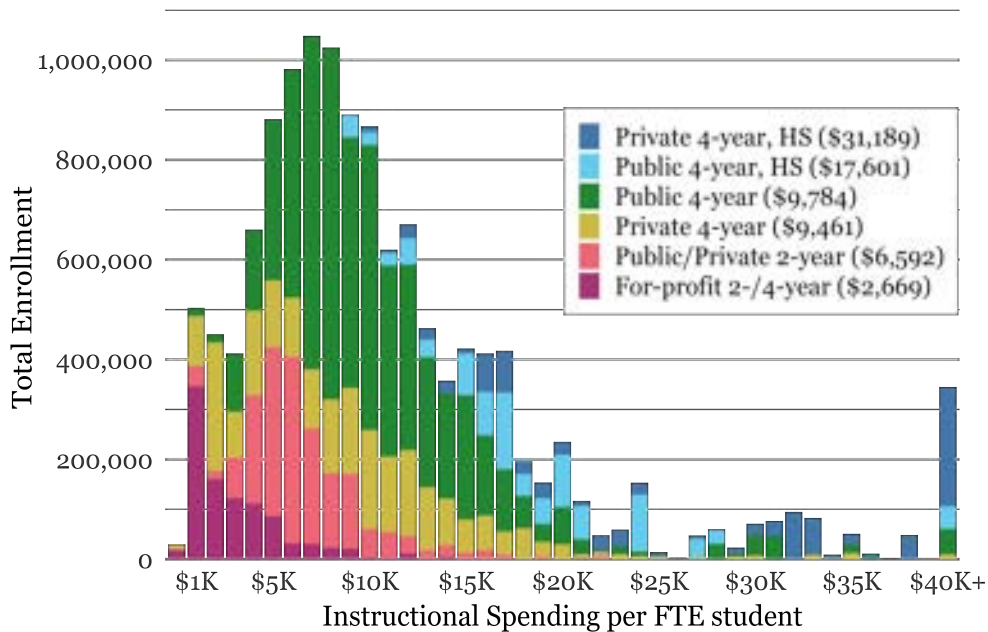
Evidence

Key Finding #1: *Postsecondary students in the U.S. experience very different levels of resources depending on where they study.*

Compared to other countries, the funding and governance of American higher education is highly decentralized. Individual states determine how (and how much) to allocate across different types of public institutions as well as institutions' ability to obtain other revenues. Many private institutions (nonprofit and for-profit) have almost complete autonomy over funding and spending decisions. The result is a tremendous amount of variation across institutions. In 2021–22, the median total spending per student was \$32,810, but one-quarter of students attend a college spending less than

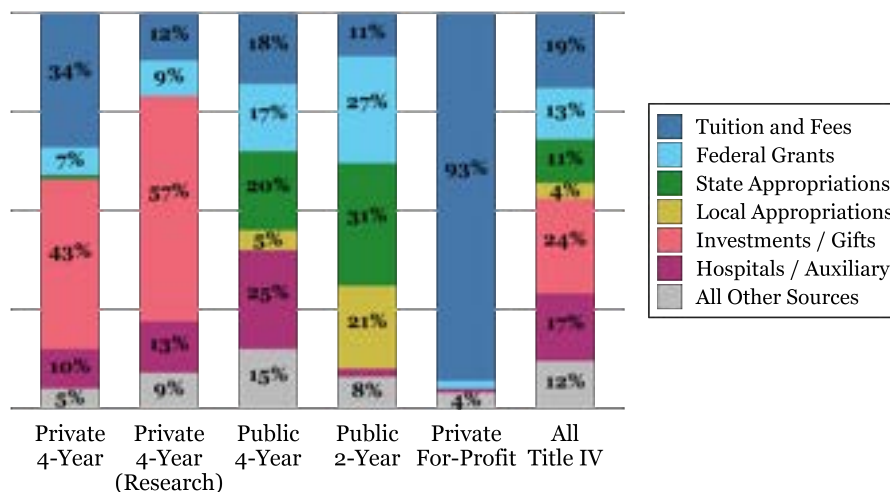
\$25,000 per student, while 10% attend an institution spending nearly four times that amount.

Figure 2. Postsecondary Enrollment by Instructional Spending, Sector, and Selectivity, FY 2022



Notes: Title IV degree-granting institutions enrolling at least 50 students (n = 3,848); FTE = full-time equivalent; HS - highly selectivity (undergraduate acceptance rate < 30%). Median per-student instructional spending in legend parentheses. Sources: Integrated Postsecondary Education Data System and Barron's Selectivity Index.

Figure 3. Distribution of Revenue Sources by Postsecondary Sector, FY 2022



Notes: Federal Pell Grants and loans are included under "Federal" for public institutions and "Tuition and Fees" for private and for-profit institutions. "Other" category includes revenues from uncategorized sources (e.g., independent operations, sales of

educational services). Investment returns were negative and completely offset by gifts in 2022 for public four-year institutions but typically account for 5-6% of total revenue. Source: NCES 2023 Digest of Education Statistics Tables 333.10, 333.50, 333.55.

Variation in instructional spending

Figure 2 shows the U.S. postsecondary enrollment distribution in 2021–22 by instructional spending per full-time student. This budget category is core to students' postsecondary experience and relatively comparable across postsecondary sectors. The figure also separates enrollment for public and private nonprofit institutions by whether they are highly selective (undergraduate acceptance rate < 30%).³ Most enrollments are in public institutions that spend between \$5,000 and \$15,000 per student on instruction, but there is a nontrivial number of students enrolled in schools with very low instructional spending and a long tail of schools with extremely high spending levels. There are also clear differences by sector and selectivity, with selective private 4-year institutions outspending their public counterparts two-to-one. The highest-spending institutions are very selective private institutions, some smaller graduate-focused schools, and a few public flagships. Underappreciated in the discourse is the overlap across sectors; many students enroll at public two- and four-year institutions with similar levels of spending, and less-selective public and private four-year institutions have almost identical levels of instructional expenditure. Extremely low levels of spending are concentrated in the for-profit sector.

Variation in revenue streams

Each postsecondary sector relies on a distinct combination of revenue sources. These varied revenue portfolios, shown in Figure 3, mean that different external factors will influence institutional resources and spending fluctuations.

- Public four-year: Institutions draw on the most diverse mix of sources, including direct state support (20%), Federal Pell and research grants (17%), and tuition revenue (18%).
- Public two-year: Community colleges rely heavily on state and local appropriations (52%), along with Federal Pell Grants to students (27%).
- Private nonprofit: These institutions rely disproportionately on investment returns and gifts (43 to 57%), especially at research-heavy institutions (which tend to be more selective).⁴
- Private for-profit: These institutions are almost entirely dependent on tuition revenue (93%), composed primarily of Federal student aid.

Since endowment revenue fluctuates, private nonprofit institutions may be susceptible to developments in the stock market despite practices meant to smooth endowment spending.⁵ Research shows that average per-student revenues at private nonprofits exceed average expenses by about 16% per year, termed excess revenue, which may be in response to these fluctuations.⁶ For-profit institutions' reliance on tuition revenue supported by federal aid means that the spending and operations of these institutions will be influenced primarily by changes in federal aid policy and regulations. Tuition dependency is also associated with more extreme changes to instructional spending; for-profit spending is the most volatile, while public institutions are more stable.⁷ Institutions with strong endowment and investment returns use these revenue streams as a budgetary buffer. Changes to state policy regarding appropriations and tuition-setting, described in the next section, are most impactful for public institutions.

Key Finding #2: *State higher education policies and funding structures drive the total resources available for public institutions and their revenue-generating strategies.*

In fiscal year 2023, state spending on higher education totaled \$116.4 billion, with local governments in 32 states contributing an additional \$13.4 billion (mostly for community colleges).⁸ Direct education appropriations to public colleges and universities fund general operating and instructional expenses. These subsidies allow state residents to attend public institutions and pay lower tuition than out-of-state students. Higher education expenditures are a significant share of state budgets, averaging about 9% of state and local spending for the last four decades.

In an economic downturn, higher education spending must compete with other budget categories, particularly healthcare and appropriations for K-12 education. As postsecondary institutions can generate revenue through student tuition, they are more susceptible to budget cuts.⁹ Empirical research uses fluctuations in funding levels and cross-state policy differences over time to understand the impacts on institutional resources, budgeting decisions, and degree production.

State funding formulas

States allocate appropriations for public higher education using three types¹⁰ of funding models:

1. **Traditional:** Under these funding mechanisms, institutions cannot directly influence funding levels through operational decisions. These models include "base-adjusted" (annual increases based on prior-year levels) or no explicit funding formula.
2. **Incentive:** Given a fixed amount of state resources, these models incentivize competition using institutional enrollment or performance measures. Enrollment models often tie funding to annual headcount or full-time enrollment, while performance-based funding (PBF) policies incentivize institutions to align their behaviors with state-defined outcome metrics. Some states build PBF into the base appropriations budget, while others set aside appropriations in a separate fund to serve as a financial bonus beyond the base amount.
3. **Hybrid:** These formulas combine elements of both the traditional and incentive models, balancing state objectives and institutional stability by guaranteeing a portion of funding from the prior year. Hybrid models are now the most common, accounting for 63% of two-year and 47% of four-year systems, followed by traditional models (19% of two-year and 46% of four-year systems).

A recent landscape analysis uses a detailed longitudinal dataset on state PBF policies to document trends in the growth and features of PBF systems.¹¹ A new wave of PBF adoption occurred in the 2010s after the Great Recession. As of 2020, over half of states used a PBF metric to tie a portion of appropriations to outcomes related to student progress—credit completion, time to degree, university transfer, or degree completions. A growing number are adding components based on post-graduate outcomes: job placement and alumni earnings. The institutions and sectors subject to PBF vary: 22 states apply PBF to both sectors, eight states have PBF for only two-year colleges, and two states have PBF for only four-year colleges. The median percentage of funds at stake has grown to around 7% in the two-year and 6.6% in the four-year sector.

Evidence for PBF policies

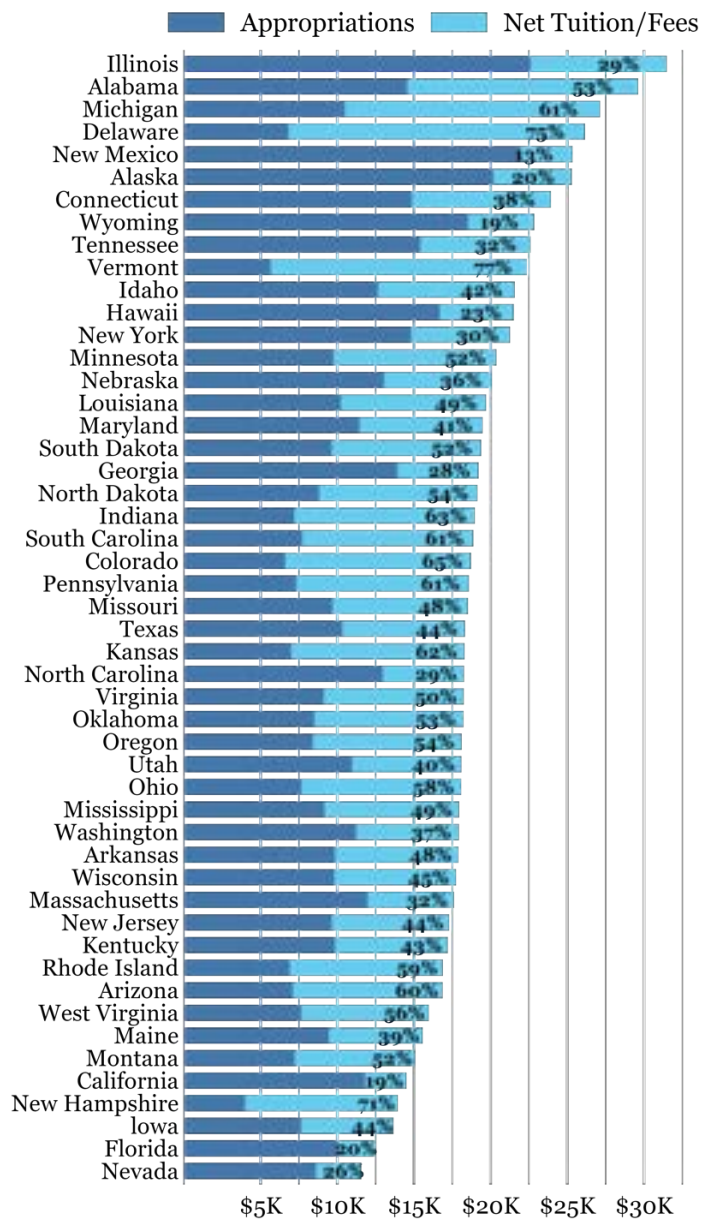
A review of the empirical literature covering four decades of PBF¹² concludes that the PBF (in various forms) has little to no impact on bachelor's degree completion. State and national studies analyzing associate degree completions at community colleges also point to no meaningful changes in degree outcomes. The consistent, insignificant effects of PBF are in part due to the malleability of this standard performance metric. Institutional graduation rates are most strongly related to first-year student characteristics and other stable institutional characteristics (e.g., Carnegie classification) and only weakly associated with characteristics that institutions can directly control.¹³ The first study to examine student earnings as a PBF outcome found modest, positive earnings effects for students already enrolled in college when PBF was implemented, but these effects faded out for later cohorts.¹⁴ PBF also comes with substantial compliance costs in management, administration, and reporting and appears to increase stratification among colleges by favoring more prestigious institutions.¹⁵ Additionally, it tends to be challenging to generate credible evidence on PBF's effects due to the relatively weak incentives created by PBF in practice. Variability in PBF models across states also makes it difficult to define the "PBF treatment," complicating assessments of PBF using data from multiple states.

Despite the attention to state formulas, leading scholars argue that the overall funding provided to colleges and universities is more consequential than the allocation approach.¹⁶ On average, community colleges and minority-serving institutions receive less state funding per enrollee. In many states, existing funding models sustain these disparities. Almost two-thirds of community college systems receive state allocations based on full-time enrollment, disadvantaging those that enroll a large share of part-time students. While many states have incorporated equity metrics into their formulas (e.g., enrolling and graduating low-income and racially minoritized students) or implemented equalization procedures, these measures have yet to remedy historical gaps in funding.

Levels of state appropriations

All states allocate funding for higher education but differ substantially in the extent of their support. Figure 4 shows institutional revenue per FTE student at public institutions in each state from two primary sources: taxpayers and students. The left portion of each bar, in **dark blue**, is state higher education spending ("appropriations"), consisting of general operating funds for public institutions, state public financial aid, and state agency funding. The right portion of each bar, in **light blue**, measures revenue from tuition and fees, excluding state and institutional financial aid. In fiscal year 2023, state higher education appropriations per FTE student ranged from \$4,000 in New Hampshire to over \$22,000 in Illinois. Public institutions in 14 states had more than \$20,000 per FTE student in total combined revenue. Different levels of public investment across states translate into meaningful differences in total institutional resources and in the proportion financed by students versus taxpayers. Institutions in 20 states receive, on average, more revenue from students than the state.

Figure 4. Revenue per Public FTE Student by State, FY 2023



Notes: Data adjusted for inter-state cost of living, excludes medical schools. Appropriations are state/local support for higher education operating expenses and student aid. Net tuition fees is tuition and fees revenue (including federal student aid) less any state and institutional aid; Source: SHEEO State Higher Education Finance: FY 2023 Report, Figure 2.3

Partisanship and state appropriations



Research shows considerable between-state variation in higher education spending based on political control in the state legislature. Historically, Republican-dominated states have provided lower support than Democratic, independent, or divided governments.¹⁷ There is also evidence that states with Republican governors have provided less generous funding to colleges and universities that enroll a large share of racially minoritized communities.¹⁸ Another study, using a set of experimental conditions, finds that pessimism about the returns to state spending among constituents can lead to less engagement from their representatives on policy issues related to higher education.¹⁹

State appropriations changes and enrollments.

Broad changes in state appropriations can significantly impact college enrollment and degree outcomes. At public universities, a 10% drop in state appropriations is associated with a 2% decrease in in-state undergraduate enrollment and a 4% decrease in bachelor's degree completion.²⁰ The negative effects of recent declines in appropriations are greatest for Black and Hispanic enrollment at institutions more reliant on state funding.²¹ More selective public universities have an incentive to grow non-resident enrollment to increase net tuition revenues. About one-quarter of states do not formalize non-resident rates at the state level, with such tuition largely set at institutional discretion.²² One study, using a panel of all U.S. public bachelor's institutions between 2002–03 and 2012–13, finds a strong negative relationship between state appropriations and out-of-state and international student enrollment, particularly at research universities.²³ A related study finds that increases in the enrollment share of non-resident students correspond to a decline in the proportion of low-income students; this trend was stronger at more prestigious universities and universities in higher-poverty states.²⁴

State appropriations changes and tuition

When faced with state spending cuts, public institutions can respond by reducing spending or increasing revenue from other sources, often tuition. One study uses panel data from colleges in New England to examine how funding cuts are passed on to institutions and students.²⁵ All else equal, each \$1 reduction in state appropriations leads to a 17-cent increase in net tuition and fees and a 30% decrease in instructional expenditures at public doctoral institutions. At community colleges, the negative effect is stronger – each \$1 of lost appropriations leads to a 56-cent decrease in instructional expenditures. Another study examines the pass-through rate of public funding declines to tuition and fees at four-year public institutions between 1987 and 2014. The author estimates that a \$1,000 per-student decrease in state funding translates to an additional \$257 cost to students each year, and this pass-through rate increases over time following further state divestment.²⁶

Higher state appropriations are generally associated with lower published tuition rates, particularly in the four-year sector.²⁷ While public institutions have historically been mainly funded by state tax appropriations, the cuts and volatility in state funding over the last few decades have prompted greater reliance on tuition.²⁸ Tuition charges as a share of public higher education spending have increased steadily, from 21% in 1980 to 40% in 2023, peaking at 45% in 2011.²⁹ According to the College Board's annual report on college pricing, over the last 30 years, published tuition and fees have increased 150% at public two-year and 200% at four-year institutions. However, most of these increases occurred between 1994 and 2014; in-state tuition and fees

(inflation-adjusted) declined by 6% at two-year colleges and 4% at four-year institutions since then. The increase in appropriations spending on a per student basis during this time likely contributed to this decline. FY 2023 is the eleventh consecutive year of per FTE increases in state education appropriations, which can be attributed, in part, to a sharp decrease in FTE enrollment and to federal stimulus funding during the COVID-19 pandemic.³⁰ Although education appropriations have recovered from the Great Recession nationally, these aggregates mask considerable differences across states. In half of all states, higher education appropriations remain below pre-2008 levels (in real dollars).

Tuition control policies

One contributor to the large cross-state variation in the net tuition revenue shown in Figure 4 is that states rely on various tuition-setting authorities, including the state legislature, a state governing board, a system-level board, or individual institutions.³¹ Institutional autonomy to set tuition levels has been shown to increase price levels overall and lead to more differentiated prices and resources across and within institutions.³² In light of affordability concerns, tuition control policies are designed to place limits on how much a college or university can raise tuition annually. The most common control mechanisms are tuition freezes, which hold tuition prices at a prior-year level, and tuition caps, which limit annual increases to a fixed percentage or dollar amount. Some states have implemented a tuition guarantee, primarily in the four-year sector, which provides entering students with a fixed tuition rate for their undergraduate studies. Tuition freezes were particularly widespread during the COVID-19 pandemic.

With limited or no ability to increase tuition revenue from in-state students, tuition control policies incentivize institutions to generate revenues from alternative sources. Evidence shows that tuition freezes are associated with increases in the levels of required campus fees that are not subject to the control policy.³³ Institutions will take other actions to balance their budget and protect against future losses, including lowering institutionally funded financial aid.³⁴ Similarly, while greater price transparency has a clear student benefit, guaranteed tuition policies can limit colleges' ability to respond to financial challenges. Analyses of early state programs find that institutions factor in this uncertainty when estimating each cohort's four-year tuition price, leading to higher year-over-year increases than in the absence of a guaranteed tuition plan.³⁵

Key Finding #3: *Institutional spending improves student outcomes.*

The main argument for sustaining spending within postsecondary institutions is that it allows for resources (e.g., more faculty, better student support services, modernized classrooms) that lead to more students completing college credentials, improving skill development and labor force productivity. Similar to resources in elementary and secondary education, postsecondary education spending influences student choices and outcomes.

Categories of institutional spending



College and university expenditures go toward different purposes, and many types of spending could affect student outcomes. Table 1 defines the broad categories for which institutions must report annual spending to the Integrated Postsecondary Education Data System (IPEDS) and sector-specific shares across these categories in 2021-22. Instructional spending should most directly affect students, but even spending on research and public service may shape students' educational environment and experience, ultimately affecting outcomes.

Across all institutions, the share of total spending devoted to instruction has declined from 32% to 27% over the past decade, while the share in academic support and student services has remained constant.³⁶ Much of the growth in total spending has come in the form of non-core spending: auxiliary enterprises, hospitals, and independent operations. Research shows that institutions increase spending on the core activities of instruction, academic support, and student services (approximately proportionately) in response to greater resources available via state appropriations.³⁷ So, the decline in the instructional share does not necessarily mean that colleges are allocating resources away from students; rather, increased spending on hospitals and other services has mostly come from additional revenue generated by these activities.

Instructional and student services spending

Institutions have some flexibility in how instructional spending budgets are allocated and how they respond to spending cuts. Research shows that relying more on lower-paid adjunct instructors is associated with worse outcomes in the community college sector, but evidence on the same question in four-year colleges is unclear.³⁸ Institutions may also increase class size, although findings on the effects of larger classes have been mixed.³⁹ More spending may also enable better classroom practices, such as active learning practices like group projects and feedback on written work.⁴⁰ Understanding how greater resources alter instructional practices and how these affect outcomes requires further research.

Table 1. Categories of institutional spending and share of total spending by sector, FY 2022

Category	Description	All	Pub. 4-year	Pub. 2-year	Priv. 4-year	Priv. 2-year
Instruction*	Expenses for teaching and instruction, faculty salaries and instructional resources	27%	25%	36%	28%	25%
Research*	Costs of research activities funded by external agencies or within the institution	11%	12%	0.1%	11%	0.1%
Public service*	Activities related to non-instructional public services, e.g., outreach programs	3%	5%	1%	1%	0.2%

Academic support*	Support for academic operations, including libraries, deans, and academic departments	8%	8%	8%	8%	13%
Student Services*	Services contributing to students' emotional and physical well-being	6%	5%	11%	9%	30%
Institutional support*	General administrative costs, including legal services and fiscal operations	10%	8%	17%	12%	23%
Net Grant Aid*	Financial aid provided to students, net of discounts and allowances for tuition/fees	4%	5%	14%	0.6%	0.7%
Auxiliary Enterprises	Services for students, faculty, and staff, such as residence halls and food services	8%	8%	3%	7%	3%
Hospital Services	Expenses related to health services provided by university hospitals and facilities	16%	18%	-	16%	-
Independent Operations	Expenses unrelated to the institution's primary mission	2%	0.6%	-	4%	-
Other	Miscellaneous expenses not classified in other categories	6%	7%	10%	3%	6%

Notes:
Public and private nonprofit Title IV degree-granting institutions; excludes for-profit institutions. Asterisk* indicates "core"

spending category. Sources: NCES 2023 Digest of Education Statistics Tables 334.10 and 334.30.

Student services spending appears particularly important for students with less academic preparation at four-year colleges. One study quantifies the effects of spending by category on completion using administrative student-level data from Ohio, comparing students at the same institutions whose enrollment timing exposes them to different levels of spending. Student services had the largest impact on completion for students who had below-median ACT scores. For students at or above the ACT median, instructional expenditures are more predictive of completion. A third insight from the Ohio study is that instructional expenditures generally have a larger impact on students in STEM fields than those in non-STEM fields.⁴¹ Earlier work using institution-level data for nearly all four-year colleges finds that student services spending has the largest association with graduation for students at schools with lower average SAT and high financial need.⁴²

While these studies potentially suffer from the correlation between spending changes and other factors mentioned earlier, their conclusion is bolstered by the accumulating high-quality evidence on the benefits of intensive student support programs.⁴³ The most high-profile is the Accelerating Study in Associate Program (ASAP) at CUNY, which provides personalized advising, transportation, financial support, tutoring, and tuition/fee waivers. A randomized experiment showed that ASAP doubled associate degree graduation rates, and these results were also

replicated in Ohio.⁴⁴ In Fort Worth, Texas, a case-management intervention targeting community college students' academic and non-academic needs increased associate's degree receipt by 31.5 percentage points for women but had no precise effect on men.⁴⁵ Intensive and personalized one-on-one academic advising also substantially boosts degree completion.⁴⁶ Collectively, these experiments show that greater investment in wraparound student support services can improve student outcomes. Spending on non-instructional amenities such as dorms, food service, and sports affects students' institutional choices, but the consequences for student outcomes are unclear.⁴⁷

Total spending, persistence and completion

Research generally finds that higher total spending by institutions corresponds with higher rates of persistence and degree completion. Most studies compare the outcomes of students attending a college when spending was high to those attending the same college when spending was low. A major challenge to interpreting this evidence is that spending changes often coincide with other factors, such as changes in tuition or economic conditions, which can have independent effects on student outcomes. This makes it difficult to isolate the effect of spending per se. One recent study uses state budget shocks, institutional differences in reliance on state appropriations, and tuition freezes to separate these factors.⁴⁸ They find that a 10% increase in institutional spending is associated with a 3% increase in enrollment levels and a 6% to 9% increase in certificates and degrees, depending on the time horizon. They interpret the effect as primarily operating through increased persistence among students who would be enrolled anyway, rather than via new enrollments. This finding is consistent with earlier national-level evidence that students in larger cohorts of high school graduates experienced resource "crowding" and lower degree completion primarily because spending does not increase proportionately to enrollment.⁴⁹ Declines in average spending of the institutions attended by students were an important contributor to the reduction in graduation rates and increased time-to-degree between the 1970s and 1990s.⁵⁰ Continued declines in spending likely would have caused these aggregate patterns to continue if grade inflation had not reversed them.⁵¹

Importantly, the existing evidence does not provide a clear guide about how the effects of spending differ across different types of institutions. This is unfortunate, as funders (states, donors) and individuals would benefit from knowing whether spending an additional dollar in one sector or one institution would be more beneficial than in another. The paper described above finds larger enrollment and completion effects for public two-year schools than four-year schools, although these are not significantly different. Since the most credible evidence relies on shocks to state support to identify spending effects, there is almost no direct evidence on the return on or effectiveness of spending in private nonprofit and for-profit institutions.

Institutional spending and college "quality"

The importance of postsecondary spending on student outcomes is also reflected in consistent, credible research evidence that higher "college quality," broadly defined, leads to better student outcomes: persistence, completion, and labor market success. While "quality" encompasses many inputs, including high-achieving peers, effective faculty, and student-supporting practices, spending per student is a useful



summary measure that captures many of these inputs. For instance, colleges with higher levels of spending will be able to have smaller and more varied classes, higher-quality instructors, and greater support services and attract high-achieving students with targeted aid. The evidence is clear that attending an institution with greater resources is causally associated with better short- and long-run outcomes. This is true at the four- versus two-year margin,⁵² between flagship and less-selective four-year institutions,⁵³ and across the spectrum of postsecondary institutions.⁵⁴ The overall level of resources available at these different types of institutions is one of the main differences underlying these contrasts, although it is not the only one. One study finds that instructional spending strongly predicts which colleges have higher value-added, especially conditional on selectivity.⁵⁵ Many studies use credible methods comparing outcomes for students barely admitted to a better-resourced college to those barely not admitted. A few studies find minimal outcome differences by institutional quality, although these studies tend to feature limited variation in quality.⁵⁶

Key Finding #4: *Resource use also varies within institutions, across departments and programs due to institutional policies and the resources required.*

While variation in resources across institutions is salient to students and policymakers, large differences also exist across academic units within institutions. These differences are not as well documented, as systematic within-institution information about spending and resource use is not widely available.⁵⁷ Researchers primarily use data from individual institutions, systems, or states to study patterns of resource allocation and use.

Resource differences within institutions

The most recent large-scale study shows substantial differences in resources required by different fields; electrical engineering is about 90% more and math 25% less costly than English to teach.⁵⁸ There are also large differences by level. Analyses of cost data from four large state postsecondary systems (Florida, Illinois, New York-SUNY, and Ohio) show that upper-division instruction is about 40% more costly per credit hour than lower-division instruction and that upper-division engineering, physical science, and visual/performing art is approximately 40% more costly than the least costly majors.⁵⁹ An earlier cost study concluded that the majority of the variance in instructional cost across institutions (see Figure 2) can be explained by the disciplinary mix.⁶⁰ The consequence is that lower-division students subsidize upper-division students and students in costly majors are subsidized by those in less-expensive majors. The cost of producing graduates thus also differs by the course pathway taken to graduation.⁶¹

Production technology by field

The availability and use of resources within institutions can often be traced to differences in the fundamentals of teaching methods and modes across fields and to market prices for key inputs. For instance, differences in class size explain, statistically, much of the cost differences across fields in the same university, followed by faculty salary differences.⁶² Some fields with highly paid faculty can offset high wages with large classes, but others cannot. Differences in production technology, such as how instructional quality deteriorates with class size,



determine this tradeoff and thus influence spending by field. Rigidities that prevent institutions from reallocating faculty resources across departments in response to changes in student course-taking can magnify these differences.⁶³ There is, however, some evidence that departments respond to differences in research and teaching productivity across faculty by allowing larger class sizes and more non-faculty teaching in fields where faculty are expensive and research-productive faculty are allocated less undergraduate teaching.⁶⁴ The estimation of production functions for postsecondary departments represents a longstanding but elusive research goal for higher education scholars.⁶⁵

Institutional and state policies and resource availability

Some states set institutional appropriations to reflect differences in the cost of providing different types of instruction. For instance, North Carolina and Texas provide funding based partly on weighted enrollment, with weights determined by the relative instructional cost of different fields and levels. Among institutions, a growing number have adopted Responsibility Centered Management (RCM), whereby academic units (typically colleges) are responsible for their own bottom line. This practice was shown to increase overall institutional resources at several institutions and likely increases differentiation across units, which have different opportunities to raise revenue.⁶⁶ Many institutions also practice differential pricing, charging more tuition to students in higher-cost and higher-earning fields. The uniform pricing scheme used at most institutions effectively results in less expensive programs cross-subsidizing more expensive programs. Differential pricing is associated with fewer students majoring in the targeted field.⁶⁷ Last, institutional preferences for producing different types of majors may also influence how budgets are allocated to instruction across fields, which alters resources and demand across fields.⁶⁸

Implications for public returns and institutional incentives

The large within-institution differences across units and fields mean that the public return on investment in different postsecondary fields does not neatly track the earnings returns across fields. Many observers assume that the fields with the highest earnings returns also have the greatest social benefit per dollar invested. However, analysis of the costs and outcomes associated with many postsecondary programs in Florida revealed that high-earning fields such as engineering and health sciences are also much more expensive.⁶⁹ Business and computer science programs offer the highest net returns to public investment, given their relatively high earnings and low costs. Resource differences across fields also influence how easily institutions can respond to their environment; it may be easier for institutions to add instruction in low-cost fields or courses in response to increased demand. However, these may not necessarily be what is best for students.

Key Finding #5: *Federal financial aid and research funding directly impact institutional behaviors and spending.*

The U.S. federal government is a major funder of postsecondary education, providing grant and loan aid directly to eligible students under Title IV and to select resource-limited or minority-serving institutions under Titles III and V of the Higher Education Act of 1965. In 2022–23, the federal government disbursed \$111 billion in student grants and loans.⁷⁰ The federal government also supports higher education research and development (R&D), funding 55% of the \$98 billion in university R&D expenditures in FY2022.⁷¹ The share of total institutional revenues from federal appropriations, grants, and contracts has increased across all types of public institutions since 2015, particularly at non-doctoral colleges.⁷²

Scholars have examined how federal funding streams influence institutional behaviors and expenditures, with an eye toward unintended consequences. Emerging evidence suggests that, following steady declines in state support, the federal role has grown from primarily supporting students to also aiding in stabilizing institutional budgets. While federal aid is channeled to students rather than given directly to institutions, it indirectly sustains institutional spending through tuition and fee revenue from students.

Federal student aid and college pricing

A longstanding theory in higher education finance, the *Bennett hypothesis*, posits that postsecondary institutions will respond to increases in federal financial aid by raising tuition prices to capture some of the aid as additional revenue.⁷³ This response could mean that policies intended to improve college access and affordability instead increase institutional spending and quality. A comprehensive review of the early empirical literature concluded that evidence for the Bennett hypothesis is ambiguous at best,⁷⁴ but later studies have identified scenarios where institutions appear to capture federal aid through higher tuition. One study exploits discontinuities in the Pell Grant eligibility formula and estimates that institutions capture a significant portion of federal grant aid, between 11% and 20%, through higher tuition or spending less on institutional grants.⁷⁵ Public institutions capture much less, around 5%, than private nonprofit institutions, which can capture over two-thirds of the aid received by students. The author also finds evidence of a Pell Grant "labeling" effect, such that institutions may be more inclined to adjust prices for students labeled as needy. A different study finds support for the Bennett hypothesis by comparing tuition charges between sub-baccalaureate institutions whose students are eligible for Title IV federal aid and institutions offering similar programs but without access to federal aid.⁷⁶ Authors show that Title IV-eligible institutions charge tuition that is about 78% higher than comparable programs in non-Title IV institutions. The general equilibrium response of institutions to financial aid expansions may reduce the effect of the aid on college enrollment.⁷⁷

To some extent, the influence of federal student aid on institutional behaviors will depend on the level of funding available to students. The maximum Pell Grant award for undergraduates for 2023–24 was \$7,395. While annual increases have roughly kept pace with inflation, tuition has risen faster—the maximum Pell corresponds to 66% of average in-state tuition and fees, a 21 percentage point decrease over 20 years.⁷⁸ The maximum that undergraduate students can borrow annually in federal loans varies based on their year in school (between \$5,500 and \$7,500 for dependent students), and these limits have been in place since 2008. Graduate students, conversely, do not have a federally imposed cap on how much they can borrow. Instead, graduate students can borrow up to the full

cost of attendance for the academic year through the PLUS Loan program, effectively allowing *institutions* to determine student borrowing limits.

Federal aid and incentives for graduate program expansion

Concerns about declines in undergraduate enrollment have prompted many four-year institutions to launch or expand graduate and professional programs to stabilize institutional budgets and diversify revenue streams.⁷⁹ There is an incentive for institutions to adjust their enrollment strategies to attract graduate students whose access to federal aid allows them to more easily pay full price for their education. In 2021–22, the average graduate tuition and required fees at public institutions was \$12,596, 31% higher than the average in-state charge for a bachelor's degree.⁸⁰ (At private institutions, average graduate tuition and fees is 21% lower, perhaps because graduate programming is more common at less expensive private colleges.) Emerging evidence shows that not all master's degree programs pay off for students or taxpayers—some newer programs leave students with high debt burdens relative to their post-graduate earnings.⁸¹ These high debt-to-earnings programs are largely concentrated in lower-earning fields such as social work and counseling at private nonprofit universities. In 2021–22, graduate students represented 21% of all students enrolled in higher education and 47% of all federal student loans disbursed.⁸²

Federal research funding and institutional expenditures

Compared to student aid, federally funded R&D serves as a source of revenue for institutions with a more direct link to changes in administrative expenditures. One study examines this relationship using public universities that shifted to research university status between 2004 and 2012.⁸³ Institutions aiming to gain or improve their research status show larger increases in their administrative spending, particularly academic support services, as they compete for federal research grants. This spending is part of the broader efforts to build research capacity—hiring faculty, improving infrastructure (e.g., research offices and labs), and enhancing research support services. As universities receive more research funding, investment in research-related management and personnel (e.g., grant and compliance managers) also contributes to higher costs. A related study finds the institutions with the highest research output, as measured by research expenditures, face significant cost pressures related to faculty salaries and the maintenance of research facilities, which federal research revenue helps offset but also inflates due to the competitive nature of research funding.⁸⁴

Federal support during economic downturns

In recent decades, state appropriations funding for higher education has decreased during poor economic times and steadily increased as the economy and tax revenues improve—a phenomenon referred to as the "balance wheel" hypothesis.⁸⁵ Using a national dataset, earlier research finds robust evidence for this cyclical relationship between 1985 and 2004, with states disproportionately cutting funding to public colleges and universities during recessions to protect other sectors such as K-12 education and healthcare.⁸⁶ State support often does not return to pre-recession levels,

and education appropriations reached a record low in 2012 following the cumulative effects of the 2001 and 2008 recessions.⁸⁷ In response to the COVID-19 pandemic and the 2020 recession, the federal government provided stimulus funding⁸⁸ to help stabilize state and local sources of revenue for higher education, mitigating some of the worst cuts.⁸⁹ While this injection of federal funds reversed the trend of a substantial decline in education appropriations in the years following a recession, it did not fully offset state budget shortfalls in many states. With the end of federal stimulus funding near, the full impact of the COVID-19 economic shock on higher education funding remains to be seen.

Key Finding #6: *Efforts to substantially rein in institutional spending have been unsuccessful because costs are an ingredient of educational quality.*

As shown in Figure 1 (pg. 1), inflation-adjusted college expenditures continue to rise, and policymakers and researchers debate how the sector can promote sustainability, efficiency, and greater value for students and taxpayers. Estimates suggest that degrees granted per dollar invested in public colleges have declined over the long term.⁹⁰ Critics argue that the sector is rife with wasteful spending, while advocates contend that the sector needs even greater resources. At the same time, higher education must contend with its changing role amidst technological and demographic shifts and the implications for financing public goods such as education. The question is how to provide the same quality and quantity of education at a lower cost or, conversely, how to provide a greater quality or quantity at the same cost. This tension is longstanding—the U.S. Congress established the National Commission on the Cost of Higher Education nearly thirty years ago, and the question persists. Critical to progress on this issue is an understanding of why spending is increasing despite stagnant enrollment. There are two primary theories:

- Cost disease: This concept refers to the disproportionate tendency of costs to rise in labor-intensive service industries over time.⁹¹ Postsecondary institutions raise employee wages in line with the broader economy, leading to higher costs without proportional increases in productivity or output.⁹²
- Revenue theory of costs: This theory suggests that colleges and universities spend as much as they can raise in revenues.⁹³ Institutions will adjust their spending based on available funding streams (tuition, appropriations, donations), so spending decisions are driven more by resource availability than cost efficiency.

As higher education relies heavily on personnel and infrastructure, rising operating costs for maintaining aging facilities, providing health insurance, and supporting historically underfunded pension systems have also contributed to costs increasing faster than the rate of inflation.⁹⁴ Additionally, in-depth case studies focusing on highly selective institutions (Chicago, Duke, Harvard, Carleton, and Cornell) concluded that spending by institutions continues to rise due to an increase in the cost of purchased inputs as well as a desire to maximize excellence in all the dimensions in which colleges operate: educational experiences of students, research contributions of faculty, and the technology and facilities in use.⁹⁵ Researchers observed a similar pattern as institutions strive to improve their position in national rankings and become more research-intensive.⁹⁶ Higher education institutions appear committed to excellence and will continue to expand in ways that enhance quality, prestige, and influence. Each of these actions increases spending, but in potentially helpful ways.

The notion of "administrative bloat" is frequently linked with the rapid rise in institutional spending. Critics cite an ever-expanding bureaucracy as an unnecessary

cost driver. In contrast, others argue that personnel growth allows institutions to attend to the range of student needs, advance institutional priorities, and meet regulatory expectations. Since the early 1990s, colleges have steadily expanded non-faculty positions to provide additional services to students outside the classroom. New positions, particularly in student services—e.g., athletics, admissions, psychological counseling, career counseling—drove a nearly one-third expansion of the higher education workforce from 2000 to 2012.⁹⁷ All sectors increased administrative positions and shifted toward greater use of part-time faculty, and over this period, faculty salaries were essentially flat.⁹⁸ While other industries have found ways to outsource services distal from the core business, higher education has done the opposite by bundling a suite of services with the instructional side. Interpreting these trends is not straightforward: it is impossible to distinguish quality-enhancing versus efficiency-decreasing growth in employees and expenditures from available data.

Looking ahead, a policy goal that both critics and advocates of higher education share is not necessarily to lower costs but to improve efficiency and productivity. A comprehensive recent study computed the productivity of all U.S. higher education institutions as the discounted lifetime earnings impact relative to social investment (in dollars).⁹⁹ The author finds large differences in the efficiency with which institutions use their resources to create student outcomes. More selective institutions are more productive than non-selective institutions, and importantly, large differences exist even within selectivity categories. Non-selective institutions exhibit particularly wide dispersion in the extent to which they use their resources to enhance the labor market outcomes of their students. Similar, although noisier, patterns emerge when incorporating other important outcomes of postsecondary education, e.g., public service and research. One interpretation is that this part of the sector faces less competitive pressure to maximize quality relative to its resource costs.

Student progress toward degree or program completion contributes to institutional efficiency, and this is one area where colleges and universities have a fair amount of control. Students who drop out, "stop out," or enroll for longer than the typical time-to-degree increase the resources expended on each program completion. Given that expenditure is a key input of educational quality, there is an inherent tension between efforts to improve completion rates and substantially increasing costs. Evidence-based approaches to economize student progress toward college completion include:

- *Promoting efficient pathways to and through college.* A number of state policies and institutional initiatives can support students' "academic momentum."¹⁰⁰ These policy tools include dual enrollment¹⁰¹ and summer bridge programs¹⁰² to support access and credit accumulation, developmental education reform¹⁰³ to improve college readiness, and articulation and transfer agreements¹⁰⁴ that ease credit transfers so that students do not need to repeat coursework.
- *Targeting aid for specific programs and populations.* These include targeting populations with some college coursework but no credentials through "reconnect" programs,¹⁰⁵ short-term credentials in priority workforce areas,¹⁰⁶ and building on-ramps to high-demand (sometimes high-return) sub-baccalaureate options. These programs may reduce costs by providing shorter credentials tailored to specific labor market needs.
- *Online instruction.* Some proponents hope that the growth of online postsecondary education, whether individual courses or entire degrees, will lower costs. The evidence is mixed, with some positive¹⁰⁷ and some negative findings.¹⁰⁸ Online

degrees may, however, help meet the demand for mid-career training for certain populations and fields,¹⁰⁹ but so far, they have not disrupted the cost structure of much of the higher education sector.

The efficacy of these interventions, much less their cost-saving efficiency, is not well known. Future research should harness a more complete understanding of the postsecondary education production process to identify and assess strategies designed to reduce costs while maintaining or enhancing educational output and quality.

Endnotes and references

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