# A New Look at the Institutional Component of Higher Education Finance: A Guide for Evaluating Performance Relative to Financial Resources

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## Executive Summary

### Introduction

Although state and local governments are working their way out of fiscal crises precipitated by the national recession of 2001 and the stock market declines of 2000 through 2002, public higher education remains in steep competition with other public sectors for continued state support. These are not entirely unusual times for public higher education. It has on several occasions throughout history dealt with—and recovered from—economic downturns that have squeezed many sources of revenue. However, the most recent recovery is accompanied by rising costs in healthcare, corrections, and sustained efforts to maintain support for K-12 education, leaving higher education as the largest discretionary item in many state budgets. Because of these constraints, there is a general feeling among many state policymakers that higher education is not likely to recover its support as quickly as it has in past economic recessions.

Underneath these difficult fiscal times are beliefs among many higher education policymakers that it is important to maintain (or even improve) access to higher education—beliefs conceived largely from their understanding of the social and economic benefits of a better educated citizenry. Within an environment of constrained resources, the abilities of states and students to pay for higher education have become the focal points for debate about higher education finance policy. However, an important interrelated issue that receives less attention is the ability of higher education institutions to improve levels of performance with the resources they already have—or with even fewer resources (see **Figure 1**).

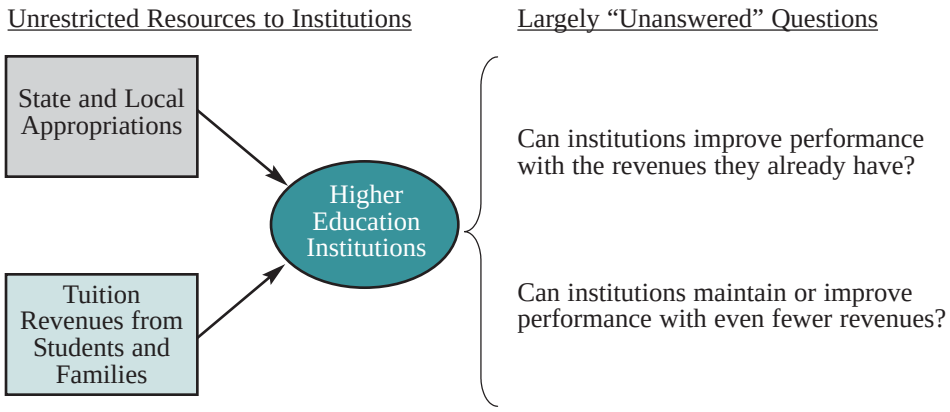
Discussions about higher education funding in most states usually leave evidence about the overall adequacy of public institution funding off the table. As a result, in times of decreasing state appropriations, institutions often attempt to offset revenue shortfalls by simply raising tuition and fees. In response to the question of "how much funding is needed?" the typical answer of "more" or "as much as our peers" leaves out all consideration of performance and affordability to students.

This project—funded by The Pew Charitable Trusts—is an effort to address the performance of state higher education systems, and the public sectors within them, relative to their levels of funding. Performance is measured using a variety of metrics for participation and completion rates, degree productivity, and research and development (where applicable). Funding is the combination of state and local appropriations and tuition and fees (the two largest sources of unrestricted funds to higher education institutions) per full-time equivalent student. The data used throughout this study were compiled and analyzed to answer the following questions:

1. Are there states and public sectors within states performing at high levels with relatively low levels of funding? (and vice-versa)

2. Are there distinguishing characteristics (e.g., mix of academic programs, characteristics of students, faculty and staff, etc.) between sectors of public institutions that perform very differently despite being similarly funded? Or between sectors that perform essentially the same with very different levels of funding?

**Figure 1**
**Concept of "Performance Relative to Funding"**




3. Are there external factors (largely outside the control of higher education) that influence performance relative to funding? (e.g., state personal income, preparation of students in high school, etc.)

## Analytical Framework

A variety of analyses were conducted to address the previous questions. The first involved constructing a series of ratios for all 50 states (and sectors within states) that gauge higher education performance on a number of measures relative to funding. The second is a more detailed analysis of public higher education sectors within a small number of states—comparing (1) sectors that perform very differently with the same levels of funding, and (2) sectors that have similar levels of performance but very different levels of funding. The final set of analyses utilizes simple correlation statistics to identify explanatory factors within states that influence performance relative to funding.

For the purposes of this study, state systems of higher education and the public sectors within states were chosen as the units of analysis. These are:

- State Systems of Higher Education (All Title IV Degree-Granting Institutions)
- Public Four-Year Research Institutions (Research Intensive and Extensive Institutions)
- Public Four-Year Baccalaureate and Master's Institutions
- Public Two-Year Institutions

Private institutions are included in the state-level analyses because in many states they play an important role in meeting the education needs of state residents and they are sometimes the beneficiaries of state scholarship programs. However, they are excluded from the sector-level analyses because of the institutional variation across states (both in terms of type and presence), and because in most states they do not receive direct appropriations from the state. Although, if one wanted to do so, the analyses used throughout this study could just as easily be applied to private sectors and institutions.

## Measures Applied in the Analyses

For all units of analysis, the measure used for total funding is: (State and Local Appropriations + Tuition and Fees) per Full-Time Equivalent (FTE) Student. State financial aid is included in the funding measure used in the analyses of state higher education systems. While institutions receive revenues from other sources (e.g., endowment income and government grants and contracts), state and local appropriations and tuition and fees account for the majority of "unrestricted" revenues. The total funding per FTE student for each state (and sectors within states) is adjusted for cost of living and faculty salaries—two important

considerations when measuring the resources available to higher education institutions.

Performance measures vary by sector of institutions but include (where possible or applicable) measures for the following:

- Instructional Service Levels (Participation)
- Undergraduate Degree Productivity
- Doctoral Degree Productivity
- Graduation Rates
- Success in Acquiring Competitive Research Funds

## The Results

For each of the units of analysis (above), a series of scatter plots displays the ratios of performance to funding for each of the performance measures. These charts display the position of each state on the performance axis (Y axis) and the funding axis (X axis). **Figure 2** displays the results of one of the performance measures at the state system level relative to total funding per full-time student. It is a measure of how well states are serving the adult population aged 18 to 44 who are eligible to enter postsecondary education but have not done so (with a high school diploma but no college experience).

States in the top-left quadrant of the graph perform well with relatively low funding levels. Conversely, states that are in the bottom-right quadrant perform poorly with high levels of funding. The top line (colored green) is the ratio of performance to funding associated with the states performing at or above the 80th percentile. This ratio is calculated by dividing the measure for performance at the 80th percentile into the average total funding of the states that perform at or above the 80th percentile. States above and to the left of this line (the greatest distance from it) perform at high levels relative to their levels of funding. The line intersecting the U.S. is the ratio of performance to funding associated with the average of all states—dividing average state performance into average state funding.

Relative to their levels of funding per FTE student, Utah, North Dakota, California, Arizona, Colorado, and South Dakota are the best at serving their adult populations aged 18 to 44 with a high school diploma but no college. In contrast, Alaska, Maine, Hawaii, and Vermont perform poorly on this measure with high levels of funding per student.

When averaging the ratios of performance to funding across all measures for state higher education systems and the public research, baccalaureate and master's, and two-year sectors, the following conclusions can be drawn (**Figure 3**).

- The five most productive state systems of higher education relative to their resources are Utah, Massachusetts, Colorado, California, and North Dakota (in order).
- The most productive public research sectors are in Colorado, New Hampshire, California, Wisconsin, and Georgia.
- Washington, Iowa, New Jersey, Virginia, and Wisconsin have the most productive public baccalaureate and master's institutions relative to their resources.
- And South Dakota, Mississippi, California, Washington, and Iowa have the most productive public two-year institutions.

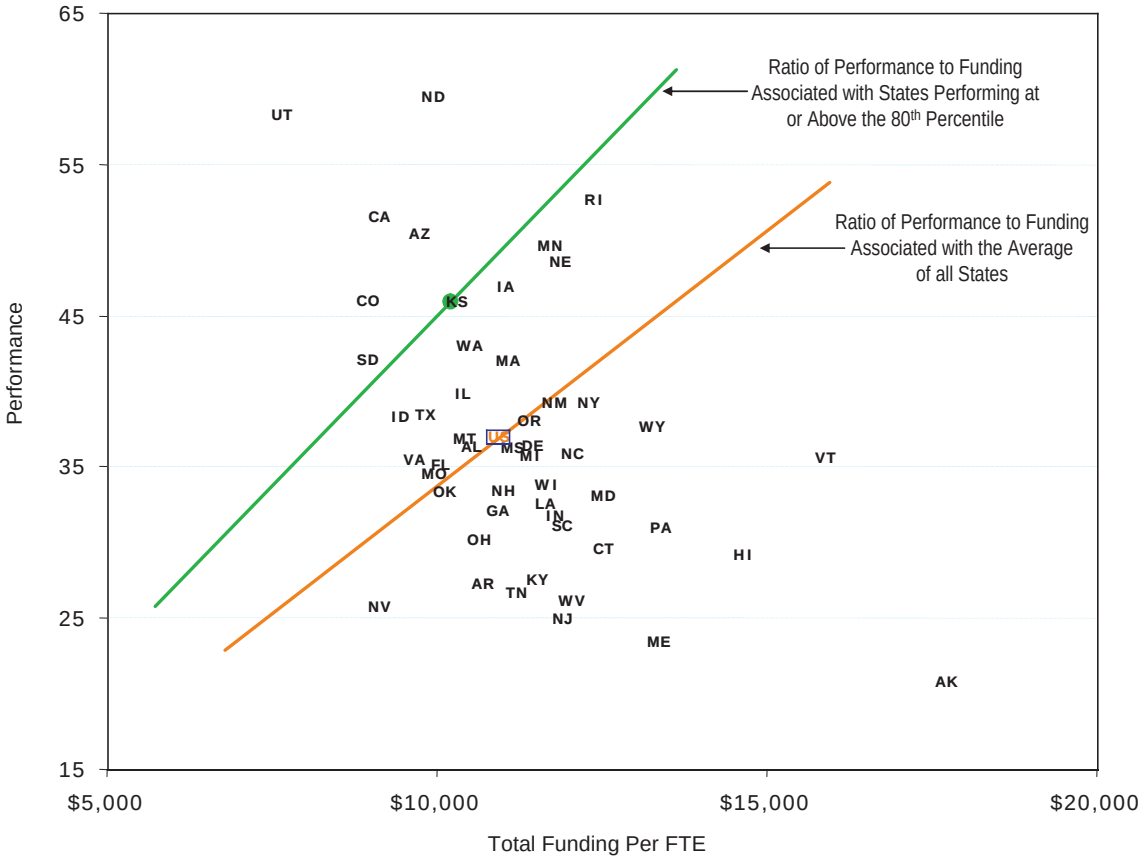
All of the analyses of performance relative to resources are available in the full report located at **www.higheredinfo.org/analyses**. In summary, there is no evidence that higher levels of resources lead to greater performance—states and the public sectors within them perform very differently with very different levels of funding. It is likely that certain sectors within states could improve their performance given the resources they already have (and some could do so with even fewer resources than they have)—because other states are already doing so. This notion deserves attention in difficult fiscal times, or when institutions automatically replace a lost dollar in state appropriations with a new dollar in tuition, thus risking affordability for students and families.

### *In-Depth Comparisons*

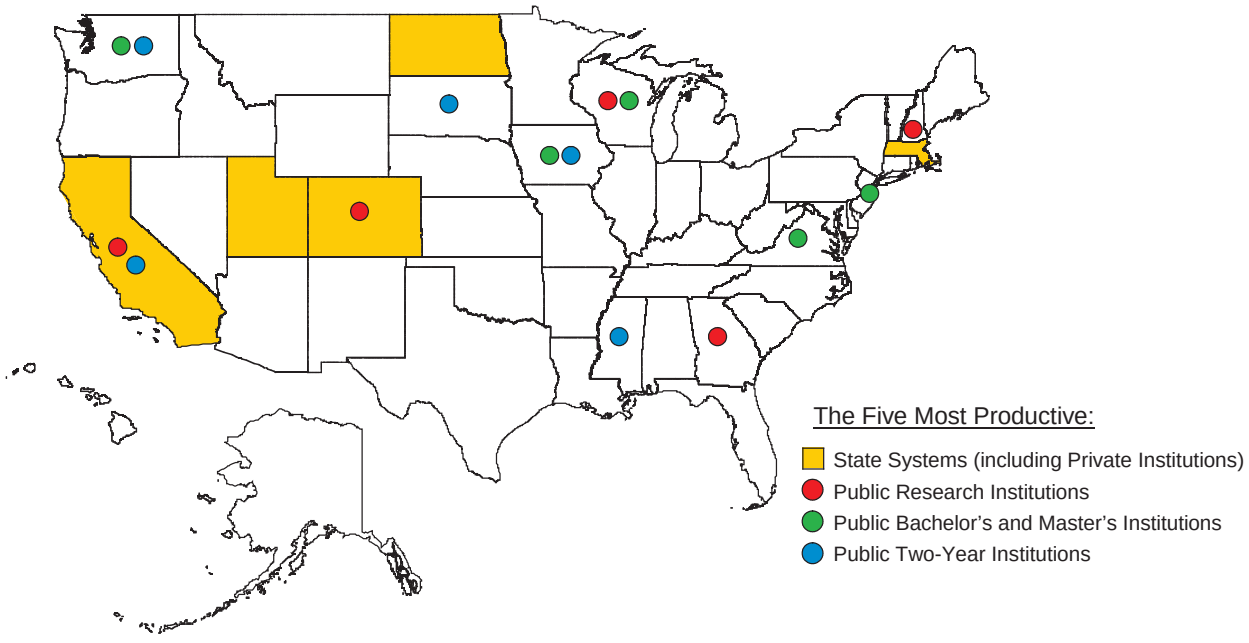
What characteristics distinguish the sectors in different states that are funded similarly but perform differently? Or perform differently but are funded similarly? More in-depth studies were conducted to determine differences in:

- Institutional Finance Strategies
- Student Characteristics
- Academic Degree-Levels
- Academic Program Mix
- Faculty Salaries
- Faculty and Staffing Patterns

## Figure 2
## FTE Undergraduates per 100 Adults Aged 18-44 with a High School Diploma, 2000




## Figure 3
## Most Productive State Systems and Public Sectors of Higher Education Relative to Their Resources



Colorado and North Carolina were the comparison states for the public research sector—state sectors that perform similarly but are funded differently. Georgia and Wisconsin were the comparison states for the public baccalaureate and master's sector (state sectors that perform differently but are funded similarly) and Pennsylvania and Washington were the comparison states for the public two-year sector (state sectors that perform differently and are funded differently).

Given similar levels of performance, Colorado's and North Carolina's public research institutions operate very differently. The total revenues and expenditures in Colorado's public research sector are roughly 60 percent of those in North Carolina's. Colorado graduates fewer students from more expensive programs (e.g., engineering and health sciences), relies much more on part-time faculty and much less on administration and technical support. In the case of Colorado, lower levels of funding appear to have resulted in a diminished capacity to provide many of the services that students and faculty have come to expect at research institutions—e.g., instructional and academic support, access to certain degree programs, the number of faculty and administrators per student, and technical support. These data also raise several important questions:

- Can North Carolina's public research institutions perform better given their relatively high level of resources?
- With such lean levels of funding, how do Colorado's public research institutions sustain above average performance? Will their performance start to decline as a result of these low funding levels?
- What levels of resources available to students, faculty, and staff are necessary to sustain or improve institutional performance?

The comparisons of the public bachelor's and master's sectors (in Georgia and Wisconsin) and two-year sectors (in Pennsylvania and Washington) were not quite as revealing but still proved useful. In general, in both sector comparisons, the largest differences are in the mixes of academic programs—which are not too helpful in explaining such large differences in performance. However, they do help point to the important notion that some sectors can improve performance with the resources they already have. In addition, they raise questions about potential external factors that may influence performance (discussed below).

### *Explanatory Factors for Performance Relative to Funding*

Without drawing conclusions about causality, correlation analyses were conducted to determine the statistical relationships between several factors (largely external to higher education) and the performance relative to funding for each unit of analysis. Potential correlates utilized in the analyses include:

- State Wealth (personal income and state tax capacity)
- Preparation for College (high school graduation rates and test scores)
- College Participation Rates
- Structure of the Higher Education System (percentage enrollment by sector)
- Minority Enrollment
- Student Cost of Attendance (difference in cost across sectors)
- Individual Rate of Return (the cost of attending college in each state and the resulting increase in lifetime earnings residents experience with college degrees)

What effect might these external factors have on performance outcomes relative to resources? A series of correlations were calculated to assess the statistical relationships between many of these external factors and the ratio of performance to funding. The following observations can be drawn.

- Overall performance relative to funding at the state system level is associated with state wealth and student preparation in high school. States with higher per capita personal income and tax capacities perform better with the resources they receive. This correlation is also true for states with higher test scores and graduation rates at the high school level.
- For the public research sectors, higher overall performance relative to resources is associated with higher state personal income, higher average scores on college entrance exams, and a higher individual rate of return. The

latter is a measure of the cost of attending public research institutions in each state and the resulting increase in earnings residents experience with bachelor's degrees (above what they would earn with just a high school diploma). In other words, states that have more vibrant economies (those that have higher paying jobs for college graduates) have more productive public research institutions.

- Performance relative to funding at the public baccalaureate and master's institutions is less associated with state wealth (although there is a weak correlation) and more associated with student performance on college entrance exams, the percentage of minority enrollments, and the rate of return on investment experienced by graduates. These institutions are typically more productive if students enter with high ACT and SAT scores and if smaller percentages of the student body are minority—populations in many states that (for a variety of reasons) are less prepared for higher education. The likelihood of earning substantially more with a bachelor's degree in some states than in others also makes a difference in institutional productivity.

- The external factors associated with overall performance relative to funding for the public two-year sectors are individual rate of return; the difference in tuition between the two- and four-year sectors within each state; and, to a lesser degree, state wealth. As in the other state public sectors, there is a positive relationship between the productivity of the two-year sector and the increase in earnings of residents with associate degrees relative to the cost of attendance. Finally, public two-year sectors are somewhat more productive in states that have greater differences in tuition between the public two- and four-year sectors—that is, where attending a four-year institution is much more expensive than attending a two-year institution.

These factors are useful considerations when benchmarking the productivity of certain sectors against the same sectors in other states. However, they do not "explain away" performance relative to funding. The strengths (statistically) of most correlations are moderate at best. There are higher education sectors in some states that perform well with the resources available—regardless of certain underlying conditions. Thus, there is still room for state policies to affect higher education performance relative to resources. The detailed data and information on each of the above analyses are available in the full report.

## Conclusion

This work is not the definitive approach to understanding which states (and sectors within states) are productive relative to their resources, but rather provides a tool to guide higher education policymakers and analysts to ask important questions about higher education finance and to provide a better analytical framework for answering them. This study is a first step in better understanding financial adequacy of institutional funding. A collective push in this direction might lead to the development of better data sources for institutional comparisons and therefore improvements in our ability to address the adequacy of institutional funding.

Admittedly, these analyses could be improved in several ways. First, more (and in some cases, better) performance measures are needed—a problem due to the lack of comparable institution-level data. Second, they fall short of providing all the information needed to fully determine situations where sectors (and institutions) may be under- or over-funded, though doing so will always be difficult given different institutional missions and goals. Finally, trend data would strengthen the analyses by providing a better sense of the direction in which states, sectors within states, and institutions are moving. Despite current levels of performance relative to their resources, some might be improving—or vice-versa. Similarly, current patterns of resource availability may have occurred relatively recently without allowing much time to affect performance.

However, what these analyses do provide are important steps in gaining a better understanding of institutional performance relative to resources and the adequacy of institutional funding. Not all institutions need more resources, some can perform better with what they have, and some can perform better with fewer resources. These considerations are rarely addressed in the complex and politically charged environment of higher education finance; when they are, they are usually statements of opinion without supporting data. This project is an initial attempt to provide supporting evidence for these discussions.

Visit **www.higheredinfo.org/analyses** for a copy of the full report.