

Expanding College Access: An Overview

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It is critical that state officials not only understand how their finance policies and access outcomes compare to other states, but they also need information on the linkages between finances and outcomes. The report *Expanding College Access* provided a systematic analysis of the association between state finance strategies and two access outcomes.

- *High School Graduation Rates*: an indicator of whether a state's educational system graduates students who are prepared for college. This measure considers the high school diploma as the usual preparation for admission to at least a two-year college. Using this measure it was possible to assess how public finance strategies have an impact on college preparation.
- *College Enrollment Rates for High School Graduates*: an indicator of whether high school graduates can afford to attend college. This indicator is frequently used as a measure of college access. There is a strong foundation in the literature on higher education finance to consider the association between state financial strategies and college enrollment.

Framework for Assessing Financial Indicators

Substantial changes in state financial strategies occurred during the 1990s, but there were variations in the patterns of change across the states. Public college tuition charges increased in most states. However, some states actually placed limits on tuition increases, or even reduced tuition charges, while other states encouraged substantial tuition increases as a means of reducing taxpayer costs of providing adequate funding for

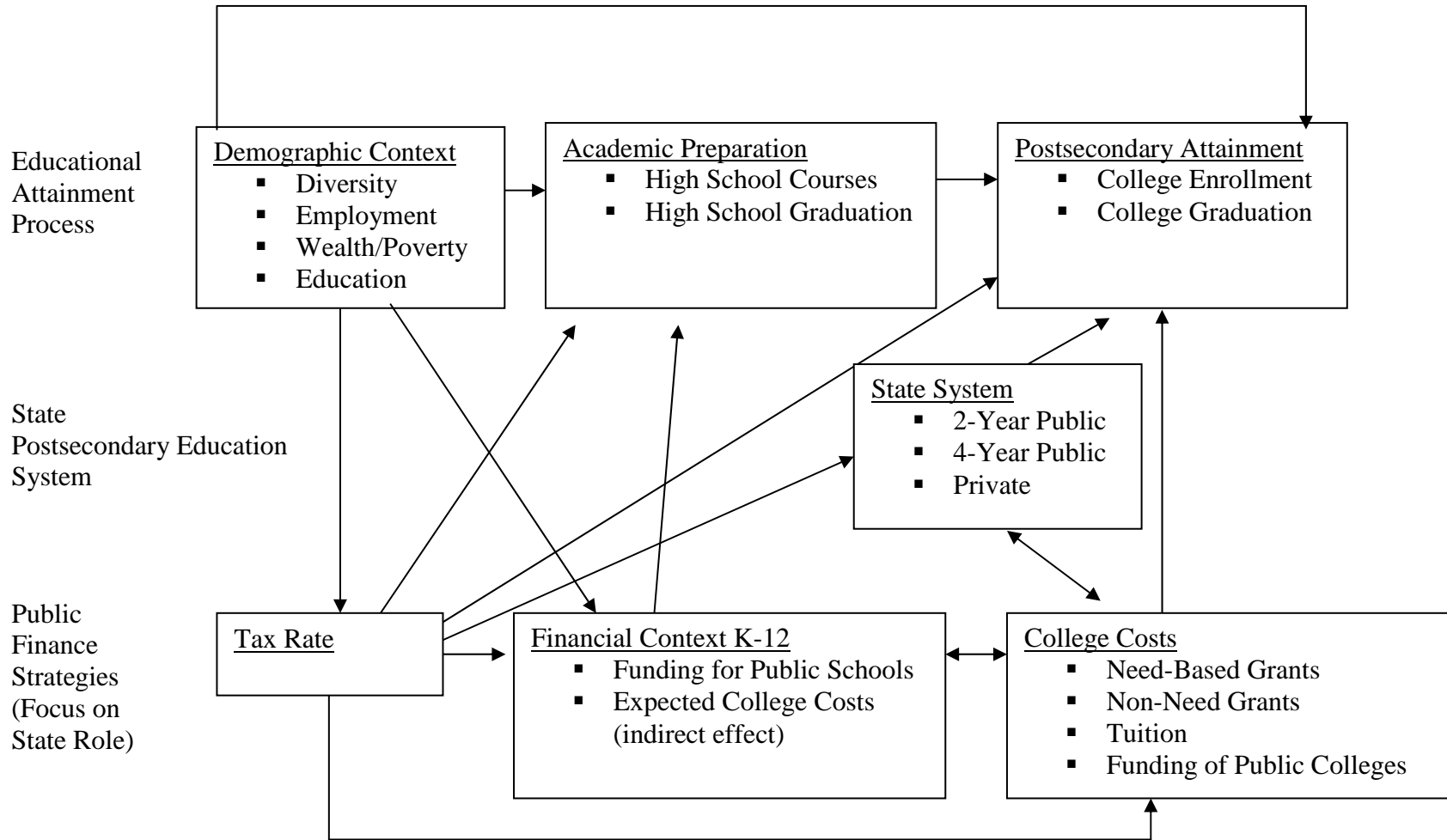
higher education. While only a few states made substantial new investments in need-based grants, several states created new merit-based grant programs. This diverse array of public finance strategies illustrates that there is not a consensus about the best ways to ensure college access.

To understand the association between financial indicators and college access, it is critical to use a logical model that is based on an understanding of the research on K-12 and higher education (see attached appendix for data sources of the indicators). The framework developed, based on a review of prior research, is illustrated in Figure 1.

High School Graduation Rates: The research indicates that the demographic characteristics of a state and the state's education system can influence high school graduation rates and therefore need to be controlled for in order to assess the independent effects of financial strategies. The study used a set of demographic indicators and a measure of the size of the student cohort in 9th grade as an indicator of the size of the state system. And while state education policies were not considered as distinct variables, the fixed effect regression method used in this time series analysis generated state variables that controlled for variations in state-level education systems. The state financial policies that have an influence on high school graduation rates included:

- Tax rates
- Funding for K-12 education
- Expected future college costs

Figure 1:
 Framework for Assessing the Impact of Public Finance Strategies on Postsecondary Attainment



The public sector tuition charges and state funding per FTE for both need-based and non-need grant aid, both measured two years prior to the cohort's graduation, were used as measures of expected college costs. This is an appropriate way to measure the effects of expected college costs. Regardless of whether high school students and their families actually understand the differences between tuition charges and the costs of attending, their perceptions of costs, along with their decisions about high school graduation, are influenced by actual costs and student aid.

College Enrollment Rates for High School Graduates: Enrollment rates can be influenced by a state's demographics, education system, and tax rates. In addition, the structure of the state system (including the capacity of the two-year and private college systems) can influence college enrollment rates. Controlling for these factors, a state's college enrollment rate can be influenced by:

- Tuition charges by public colleges and universities
- State funding per student for need-based grants
- State funding per student for non-need grants, including merit grants

State funding for college is also important, but controlling for tax rates, tuition charges have a more substantial influence on enrollment rates than do public subsidies. At a given population size and tax rate, states can increase the capacity of public colleges by letting tuition rise and increasing student aid to ensure access for low-income students who graduate qualified for enrollment. In this sense, tuition charges by public colleges are a substitute for across-the-board subsidies to public colleges. However, adequate student grant aid is needed to make sure that the education marketplace works for all

qualified students and that finances are not a reason for denying access. There is a lingering question in some states about whether non-need grants or need-based grants have a more substantial influence on enrollment rates.

State Finances and High School Graduation

State demographic characteristics and the education system can influence high school graduation rates along with state finance. Variables related to all of the indicators with a logical relationship with access were tested in various versions of the statistical model. The variables included in the final model are presented in Figure 2.

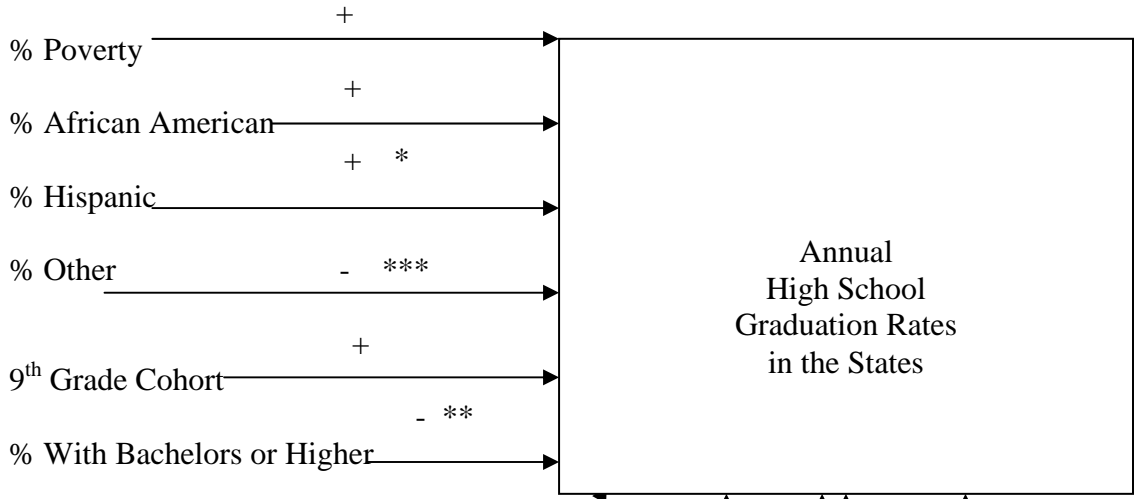
Demographic characteristics of states had differential effects on high school graduation rates, controlling for state finance strategies. Poverty rates, percentages of African Americans, and the size of the cohort were positively associated with high school graduation rates but were not statistically significant. The percentage of Hispanics had a modest and significant positive association with high school graduation rates. In contrast, the percentage of other minorities (Asian Americans, American Indians, and other groups),¹ was negatively associated with graduation rates, a finding that merits further study. In addition, the percentage of the population with bachelor's degrees was significant and negatively associated with high school graduation rates, controlling for other variables in the model. This finding is probably an artifact of migration patterns of college graduates,² an issue that merits further exploration.

¹ It was apparent in the analyses that the percentage of American Indians in particular had a negative association with high school graduation rates. However, due to the small number of cases (50 states for 5 years), it was not possible to consider each group separately.

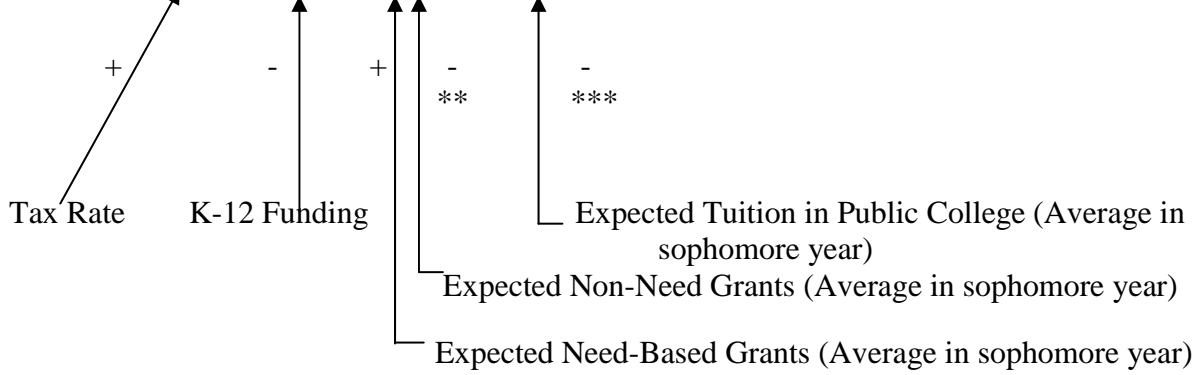
² If states import educated labor, it would take a half generation for this migration to influence high school graduation rates because the children of the immigrants would need to reach high school graduation ages. Thus, the high school graduation rate is probably more directly related to the resident population than to the immigrant population.

Figure 2:
High School Graduation Rate

Demographic Factors:



State Finance Strategies:



Key:
 → Direct Effect
 (+) Pos (-) Neg
 * p < .1
 ** p < .05
 *** p < .01

Both tuition charges and per-FTE funds for non-need grants, as measured two years before graduation, were significant and negatively associated with high school graduation rates. The decline in high school graduation rates was in part an unintended consequence of the increases in college tuition charges during the 1990s. There is a strong, logical basis for the finding. Low-income students who had low or moderate GPAs in 9th or 10th grades may be discouraged if they think it is not possible to raise their grades to the level needed to receive merit grants. Many states' merit grant programs have high minimum criterion (e.g., 3.0 GPA). To make matters worse, in some states merit aid is tied to scores on standardized tests. If students in 9th or 10th grades receive low scores on standardized tests, they get an unintended negative message.

Three of the state finance variables were not significantly associated with high school graduation rates. Tax rates had a positive association, K-12 funding per student had a negative association, and need-based grants had a positive association. While these variables were not statistically significant, it is possible that variations in these funding strategies will influence graduation rates, holding other variables constant. In particular, it is important to note that need-based grants have a positive association with graduation rates. Since the impact of need-based grants is linked to grant adequacy for low-income students, it is reasonable that increases in the amount of need-based grants to a more adequate level could be associated with improved graduation rates, especially given the findings on tuition and non-need grants.

State Finances and College Enrollment

States' college enrollment rates for high school graduates can be influenced by college tuition and grants, demographic characteristics, the K-12 education system, and the capacity of state higher education systems. The analyses of college enrollment rates are summarized in Figure 3.

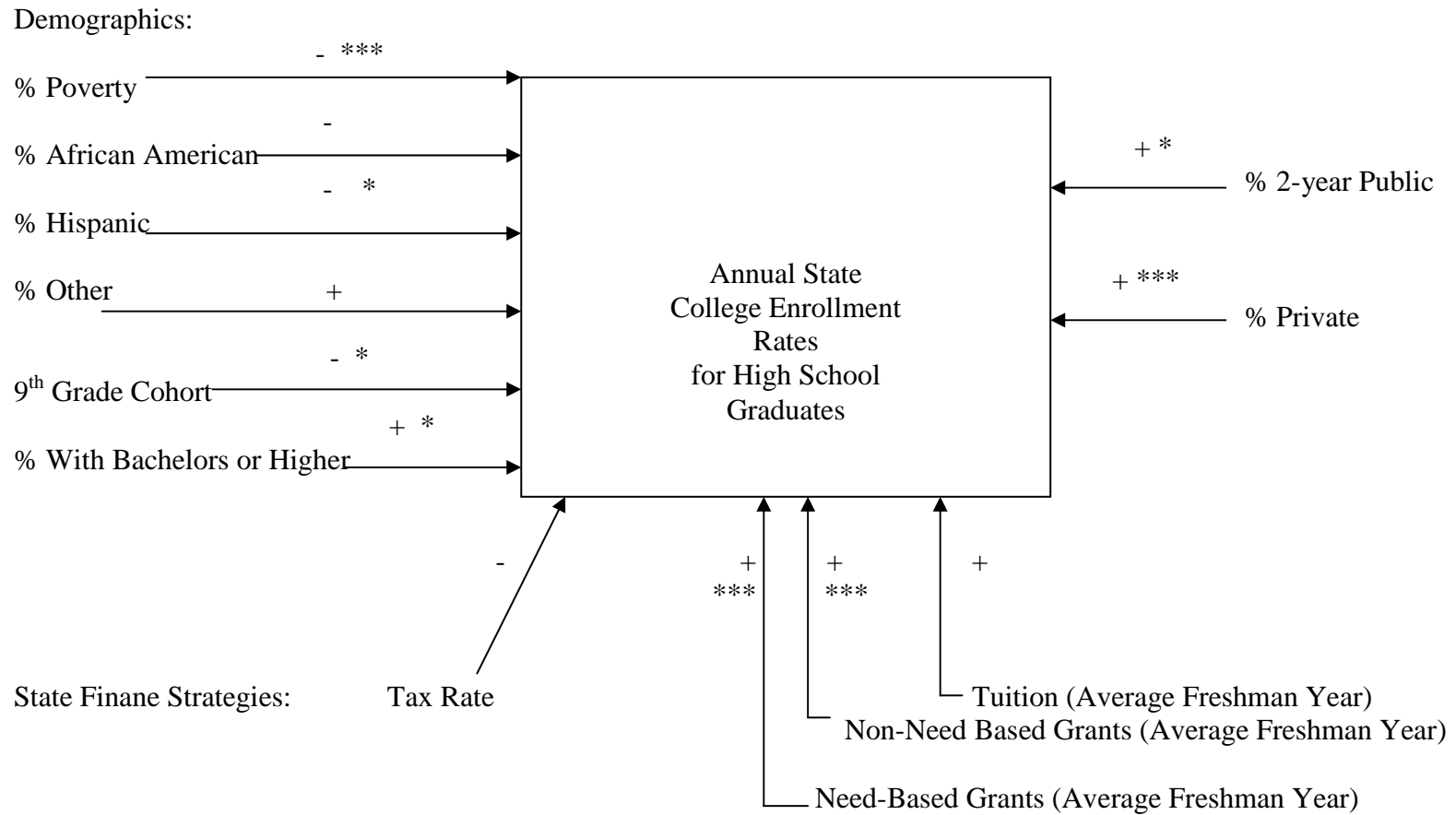
The demographic characteristics of states were associated with college enrollments in different ways than was evident in the analysis of high school graduation. Poverty rates and the size of the cohort were significant and negatively associated with college enrollment. The percentage of African Americans was negatively associated with enrollment, but was not significant. The percentage of other minorities was positive, but not significant. These differences across the two analyses in the direction of association provide an interesting contrast,³ an issue that merits more exploration. The percent of the population with college degrees was positively associated with college enrollment rates.

Tax rates were not significant and were negatively related with college enrollment rates. It is possible that the effects of tax rates are mitigated through public finance strategies—institutional subsidies, tuition, and grants—and the structure of the state system. These findings indicate states can achieve economy in the use of tax dollars by coordinating tuition and state grants.

The structure of state systems had an influence on enrollment rates. The relative sizes of two-year college systems (as measured by the percentage of FTE enrollment) and

³ Assuming a constant quality of education in states, it is logical to expect lower college enrollment rates when high school graduation rates are high, and vice versa. In one scenario there are more high school educated students who do not go to college, while in the other there are more dropouts who do not go to college. The reason why this pattern was evident for different ethnic groups across the states is not entirely clear, but merits further exploration.

Figure 3:
College Enrollment Rate



Key:
 → Direct Effect
 (+) Pos (-) Neg
 * p = < .1
 ** p = < .05
 *** p = < .01

private colleges (again, as measured by the percentage of FTE enrollment) were positively associated with enrollment rates. Two-year college systems have lower costs for taxpayers than four-year colleges while private colleges are largely funded by students and need-based student grants, a low-cost method for taxpayers to fund access to four-year colleges.

Both need-based and non-need (merit and other specially directed) grants were significant and positively associated with college enrollment rates. The size of the coefficients for need-based grants was larger, indicating a more substantial effect, but it is important to note that both strategies have a positive statistical association. Increased funding for non-need grants did enable states to expand college access in the 1990s, even though this strategy had an unintended negative effect on high school graduation rates.

Finally, it should be noted that tuition and fees were positively, but not significantly, associated with college enrollment rates. A couple of reasons support the positive association. First, tuition charges in public colleges are positively associated with total educational revenue per FTE (the combination of tuition and state subsidies). At a given percentage of state subsidy (say, if state funding were set at 70% of education revenue), high tuition charges would mean higher education revenues. Holding education revenues per FTE and total tax subsidies constant, as state subsidies per student go down (say dropping from 70% to 60% of education revenue) the capacity in the public system (i.e., the number of seats, or supply of opportunity) goes up. So at a given tax rate and revenue level, states can expand capacity by letting tuition rise, a pattern evident in the 1990s.

However, if tuition rises and need-based grants do not increase at a sufficient rate, then inequalities develop in college affordability. As tuition goes up, more need-based grant aid is necessary to ensure financial access for low-income students. Federal loans and grants do not provide sufficient funding for low-income students in most states. If states have merit grant programs, then low-income students who qualify gain financial access as a result of high achievement. However, merit grants are an inefficient use of tax dollars, at least if they are considered a means of promoting access, because most of this aid goes to middle- and upper-income students who could afford to pay the direct costs of attending college and often would attend without merit aid.

Therefore the coordination of finance strategies represents a critical challenge for states that are committed to expanding access and making efficient use of tax dollars. These findings verify what economists have known for a long time: high need-based grants coupled with high-tuition charges is an efficient means of funding access to college. And while high tuition and low levels of grant aid may cost less, this strategy is not effective because it leaves a large number of students behind (as high school dropouts or graduates), unable to pay for college.

Meeting the Access Challenge

Most states are faced with the challenge of improving college access. The most straightforward approach for providing an equitable access strategy is to coordinate tuition and grant aid strategies (see *Expanding College Access: State Trends and Simulations*). *Expanding College Access* proposed an equity standard, based on a review of financial trends in public colleges and universities and demonstrated the impact on

enrollment of these two strategies (see Table 1). Making the assumption that tuition and fees substitute for tax dollars, we can use *the equity standard: states should invest an amount in need-based grants that equals one quarter of tuition charges.*

Table 1: Simulated Effects of Alternative Approaches to Coordination of Public Tuition and State Grants in the 1990s

Alternative	Effects for Average Year in 1990s			
	High School Graduation		College Enrollment	
	Rate Increase	New Graduates	Rate Increase	New Students
Raise Current Grants to Equity Standard	1.0% point	38,000	3.8% point	121,000
A New Second-Tier Grant Equaling Equity Standard	2.1% point	77,000	7.9% point	255,000

Had states invested in need-based grants in the 1990s at a rate equaling the equity standard, it is estimated that an additional 380,000 students would have graduated from high schools and an additional 1,210,000 students would have had the opportunity to enroll in college. The state reports identify how well individual states did relative to this standard. Most fell short. Three met the equity standard (New York, New Jersey and California). One of these states (California) had limited access because of limits on the supply of college opportunities and therefore could have benefited from higher tuition and higher aid, using the combination of tuition and state subsidies to fund expansion of the state system.

The state reports also estimate the benefits of a state and federal government need-based grant partnership. Had states and the federal government shared the costs of a second tier grant equaling one-quarter of tuition charges on top of current grant programs in the 1990s, it was estimated that an additional 770,000 students would have

graduated from high school and 2,550,000 additional students would have enrolled in college. The state reports provide state-by-state simulations of the proposed partnership.

The state-federal partnership was proposed to stimulate collaboration between the federal government and states on a coordinated approach to meeting the access challenge. Expanding college access over the next two decades is vital to economic development and the quality in life in the U.S. Further federal costs of the partnership would probably be less than providing loan subsidies to the same students, a strategy that would not have had the same positive effects on enrollment.

Appendix State Financial Indicators

Annual reports by NCES in the Integrated Postsecondary Education Data System (IPEDS), as well as supplemental analyses provided by Tom Mortenson at Postsecondary Education Opportunity, provided educational attainment data. The indicators were:

- High school graduation rate, used as an outcome measure (calculated from NCES high school graduation data and the enrollment when the cohorts were in 9th grade).
- College enrollment rate, used as an outcome measure (fall enrollment reports were used to calculate the percentage of high school graduates enrolled in higher education in the following fallⁱ).
- Size of the 9th grade cohort, used as an independent variable to control for population size (from NCES's Common Core of Data).

IPEDS was the primary data source for the financial indicators. Analysis of IPEDS represented a major part of the work required to complete this project, given the complexity of this information system.ⁱⁱ IPEDS was used for information on:

- College finances (College tuition weighted per FTE).ⁱⁱⁱ
- State system and college enrollment (Fall enrollment data were used to develop weights^{iv} for financial indicators and to calculate the percentage of FTE students enrolled in the various sectors of higher education, public four-year, public two-year, and private colleges in the state. These analyses used total FTE rather than college freshmen enrollment because this provided a better indicator of capacity.

The other indicators related to public finance included:

- Tax rate (state tax collection in a given year divided by personal income, an indicator from U.S. Census Bureau, State Government Tax Collections).
- Need-based grants adjusted per FTE (Total need-based grants were derived from NASSGAP, Annual Survey Reports and divided by undergraduate FTE in the state).
- Non-need grants adjusted per FTE (The sum of total merit and other grants were calculated from NASSGAP, Annual Survey Reports and divided by undergraduate FTE).
- K-12 expenditures per FTE (NCES, National Public Education Financial Survey).

In addition, this report uses the following state indicators, developed from other data sources:^v

- Percent poverty in the population^{vi} (U.S. Census Bureau, Current Population Survey).
- Percent African American (U.S. Census Bureau, Population Estimates).
- Percent Hispanic (U.S. Census Bureau, Population Estimates).
- Percent other minority (calculated by adding the percentages of Native Americans and Asians, U.S. Census Bureau, Population Estimates).
- Percent of the population with bachelor's degrees or higher^{vii} (U.S. Census Bureau, Current Population Survey).

Using this method, a set of financial indicators was developed for each state which was used in the analyses of academic preparation and college graduation. In the near future, the Lumina Foundation for Education will disseminate state reports using the indicators.

ⁱ The study team used IPEDS, along with data reported annually by Tom Mortenson in Postsecondary Education Opportunity newsletter and available from postsecondary.org. Using NCES data, Mortenson calculated college continuation rates by state based on the number of high school graduates from the Current Population Survey of the Census Bureau and college freshmen from the IPEDS Fall Enrollment.

ⁱⁱ It was frequently necessary to sum information for campuses and states across different data files in order to develop appropriate indicators.

ⁱⁱⁱ Education revenues and expenditures as well as state appropriations were considered in preliminary analyses but not included in the final model.

^{iv} College tuition charges in public colleges were weighted for each state to reflect the actual pattern of enrollment in the state. The number of undergraduates enrolling in each public college was multiplied by the undergraduate in-state tuition charge for the college, then these numbers were summed and divided by the total number of undergraduates enrolling in the state. This weighted tuition charge reflects the composition of enrollment in the state.

^v These indicators were generally available as state averages. We generated these indicators by extracting information from generally available sources, which did not require the extensive reanalysis necessary to work with the cumbersome IPEDS databases.

^{vi} We also examined other possible indicators related to state economic conditions, including unemployment rates and income per capita.

^{vii} This variable provides a logical control for the influence of parents' education. There is a high correlation between the percentage of high school students in a state whose parents attended college and the percentage of the population with a four-year degree or higher. We also tested the inclusions of a variable for the percent of the population with at least a high school diploma and/or some college. Including this variable had no discernable effect on the results, so it was left out of the final model.