Beneath the Surface:

A Statistical Analysis of the Major Variables Associated with State Grades in *Measuring Up 2000*

By Alisa F. Cunningham
and Jane V. Wellman
The Institute for Higher Education Policy

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Foreword

Since the release of *Measuring Up 2000: The State-by-State Report Card for Higher Education*, in November 2000, the National Center for Public Policy and Higher Education has commissioned a number of studies designed to test relationships among and between the performance categories in the report card. The first of these tests was conducted by Peter Ewell of the National Center for Higher Education Management Systems (NCHEMS), resulting in a Center publication, *A Review of Tests Performed on the Data in Measuring Up 2000*, published in June 2001.

This publication, *Beneath the Surface: A Statistical Analysis of the Major Variables Associated with State Grades in Measuring Up 2000*, builds upon that work. Jane Wellman, senior associate at The Institute for Higher Education Policy, and Alisa Cunningham, director of research at the Institute, completed tests to better understand the "drivers" of performance used in *Measuring Up 2000.* A related study, *Supplementary Analysis for Measuring Up 2000*, prepared by Mario Martinez and commissioned by the National Center, explores the relationships within and between performance categories.

The National Center is grateful for the contributions made in this paper and welcomes the responses of readers.

Joni Finney
Vice President
The National Center for Public Policy and Higher Education

INTRODUCTION

This paper presents the results of a statistical analysis of *Measuring Up 2000*,[1] the first report card on state postsecondary education performance in the United States. *Measuring Up 2000* represents an ambitious effort to synthesize data about postsecondary education performance for the 50 states. Despite the necessary limitations of measures of this sort, it provides an opportunity for analysts and policymakers to take the next steps: to continue to improve how we assess performance in higher education; to test the relationship between policy and performance; and to use these assessments to improve both policy and performance.

This paper explores one way to understand the bases for the grades in the report card. Using multivariate statistical analysis, this report tests the strength of the relationships between the grades and organizational, funding, and demographic/economic variables. The purpose is to learn what this kind of analysis reveals about the factors that predict overall performance and, in particular, to separate the degree to which policy and design—rather than environmental conditions—are associated with performance. By mapping these "predictor" variables, we hope to learn more about the types of interventions and policies that are most likely to influence performance for each measure. The results can be instructive about the nature of the measures, as well as helpful in suggesting directions for state-level policy research.

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This paper begins with a general discussion of the challenges presented by *Measuring Up 2000*, and of the need to probe state-level aggregate data to learn more about how policy decisions are related to performance. The discussion then turns to a review of the design of the statistical model, and how the data were organized for the research. The results of the statistical analysis are presented, and the paper concludes with a discussion of the possible meaning of the results, including suggestions for future research.

[1] National Center for Public Policy and Higher Education (San Jose: 2000).

THE CHALLENGES PRESENTED BY *MEASURING UP 2000*

What's in the Report Card?

Measuring Up 2000 grades each of the 50 states on an A to F scale (based on a numerical index) in five statewide performance categories: preparation, participation, affordability, completion, and benefits. Measures for several sub-components of performance are embedded within each grade, each weighted by the National Center to reflect its judgment about the importance of the measure in relation to performance. A brief summary of the performance categories, the variables within them, and how they are weighted, is shown in Table 1. The grades, based on benchmarks or standards achieved by the highest performers, were assigned according to states' performance in comparison to one another.

Table 1

Summary of Graded Measures in *Measuring Up 2000*

Measure	*Definition*	*Components (Weight within the Measure)*
Preparation	Adequacy of state preparation for education and training beyond high school	High school completion (20%) K–12 Course taking (40%) K–12 Student achievement (40%)
Participation	Opportunities for enrollment in education and training beyond high school	Young adults postsecondary enrollment—high-school-to-college rate and 18–24 years of age (60%) Working-age adults postsecondary enrollment—25–44 years of age (40%)
Affordability	Relative affordability for students and families	Family ability to pay (50%) Strategies for affordability (40%) Reliance on loans (10%)
Completion	Academic progress, degree, and certificate completion	Persistence (20%) Completion (80%)
Benefits	State benefits from an educated population	Educational achievement (30%) Economic benefits (25%) Civic benefits (25%) Adult skills (20%)

Moving from Critique to Analysis, Diagnosis, and Engagement

Measuring Up 2000 is designed as a diagnostic tool for state policymakers, but it is incomplete. Because the report card focuses on aggregate state performance (rather than on institutions or sectors), it reorients the policy discussion from the institutional to the state level. As a result, state decision makers—using more detailed data and informed by their own understanding of the state's approach to higher education—will need to look behind the grades in the report card.

The State as Unit of Analysis

Measuring Up 2000 is designed to focus on aggregate, systemic performance for the entire K–16 continuum, and does not differentiate between K–12 and postsecondary

education, or between sectors of postsecondary education.[2] Aggregate statewide data trouble many people because such data gloss over important differences—programs, student admissions criteria, faculty, mission, funding—that are presumed to determine performance at the institutional level. Higher education analysts understand higher education in institutional and sector terms, rather than in state terms. They also prefer more subjective assessments about quality to objective data-driven measures because of the widely held view that quality is best understood in the context of the individual institution and its mission. The state-level aggregation presents another challenge in the wide differences between the states in terms of size, location, and access to natural and other resources. Many of the influences on state performance emanate from geographic, economic, and human influences that come from other states (or countries). This is a particular challenge in the New England and other northeast and mid-Atlantic states, where the states are often very small geographically, and in the southern states, which share a strong regional history.

The Focus on State Policy

One of the most important challenges to come from *Measuring Up 2000* is that it forces the conversation about higher education performance to a state policy level. States continue to be the biggest decision makers about higher education in the United States. States make decisions about how to design and structure the "system" of higher education, including the relative role of community colleges, comprehensive institutions, public research universities, and private, not-for-profit institutions. Latent in these design formulations are decisions about policy priorities for higher education, as these are manifested in factors such as admissions selectivity and doctoral education. They also reflect decisions about governance. States decide who will sit on public institutional governing boards, and whether the boards should be system- or campus-based. They decide whether private, not-for-profit institutions will play an explicit role in meeting state policy goals. Yet despite the importance of state decision making, the relative role and effectiveness of state policy on higher education performance has not been the focus of higher education research for some time. Many states have reorganized their statewide governance structures in the past decade, moving away from regulated, centralized bureaus toward more market-based strategies. One of the consequences of the change in governance has been a

[2] The measures in the report card are limited for the most part to traditional, "collegiate" institutions of higher education. Some of the measures (e.g., participation, affordability, and completion) in *Measuring Up* do not include data from the proprietary sector of higher education, because state-level comparable data are not available. It is hard to know how these exclusions influence aggregate performance; presumably some states would "do better," and others worse.

weakening of state planning and policy capacity for higher education. As a result, state decision makers are not well positioned in many states to return to analytical, data-based conversations about aggregate postsecondary performance. This situation holds only in higher education, however; in K–12, the last decade has generally seen a strengthening of central state policy and planning capacities.

CRUNCHING THE NUMBERS: LOOKING BEHIND THE GRADES

The purpose of our statistical analysis of *Measuring Up 2000* is to determine if there are broad patterns across the states in the types of factors that predict aggregate state performance. We are particularly interested in separating the different influences on performance from broad environmental, demographic, and economic factors, in order to see how performance is associated with these measurable "mega-factors." To reach this aim, we gathered state-level data on 23 measures, organized them into three clusters of types of "drivers," and subjected them to a series of regression analyses to learn the relationships between them and the grades in *Measuring Up*. The three clusters are:

1. *Economic and demographic influences*, reflected in data on the labor force, income, race and ethnicity, and the age distribution of the population;
2. *Institutional design or structural influences*, as these are measured in data on the number and types of postsecondary institutions in the state; and
3. *Influences from funding levels*, reflected in total resource availability and sources of revenue for all of education, from K–12 through postsecondary education.

The overall analytical framework guiding the analysis is that these clusters differ from one another in the type of state policy needed to influence performance within them. Understanding how these influences affect performance can suggest directions for policy, as well as the most effective aim of policy—toward students, institutions, sectors, or the connections between higher education, K–12 schools, and the economy. For instance, performance problems attributable to economic and environmental factors require policy interventions that connect education with other aspects of social and economic policy. Performance that is more directly associated with funding or linked to system design requires different interventions.

The variables we identified and the way we clustered them are shown in Table 2. Some of these were drawn from the contextual data collected for *Measuring Up*, but we could not use the same measures that were incorporated into the grades in *Measuring Up*, since the point of the analysis was to test the relationships between the dependent and independent variables. Some of these are fairly standard measures

within higher education, but a few were constructed for this analysis. Appendix I describes the data sources that we used for the measures, and the complete listing of state scores on each of the different measures is provided in Appendix II.

Table 2

Preliminary Measures Organized by Clusters of Influence		
Economic/Demographic	***Design***	***Funding***
Per capita personal income (PCPI)	% of undergraduates enrolled at public 2-year institutions (PCPUB2C)	Education spending per $1,000 gross state product (EXPGSP)
State population (POPUL)	% of undergraduates enrolled at private 4-year institutions (PCPRIV4)	Elementary & secondary public education spending per student (EXPSTUD)
Projected % change in the number of high school graduates (CHGGRADS)	% of non-white students enrolled in higher education (PCMINHE)	Higher education appropriations per $1,000 of personal income (APPRINC)
% of state population with less than high school diploma (LESSHS)	State population per higher education institutions in the state (POPINST)	Higher education appropriations per capita (APPRCAP)
% of state population that is non-white (PCMINST)	% of students enrolled part-time (PCTPT)	Gross tuition revenue as % of total education & general revenue, weighted by FTE students (WTPCTUIT)
% of households in the state living in metropolitan areas (PCMETRO)		Average undergraduate in-state tuition and fees, weighted by FTE undergraduates (WTTFAV)
% of children living in poverty (PERPOV)		Average institutional and state aid per FTE student (AIDSTUD)
Gini ratio, a measure of income inequality (GINI)		Ratio of average subsidy per FTE student for public research/doctoral institutions to average subsidies for public 2-year institutions in the state (SUBSRAT)
		Average difference between average subsidy per FTE student for public research/doctoral students and average subsidy for public 2-year institutions in the state (SUBSDIFF)
		Index of resource equity, measure of equity of resources among K–12 school districts (RESEQUIT)

Note: See Appendix I for source information.

It is important to recall that these statistical tests will be an imperfect measure of the relative influences on performance, since the tests measure only the associations (relationships) between variables. It is always tempting to infer that associations mean influences, and that influences imply some degree of causation. From the tests alone, however, we cannot know the direction of influence or the degree of causation between these clusters and the performance measures in the report card. In addition, the data are so highly aggregated that it is best to think of the results as pointing to broad relationships that might be explored further in future research, in which variables may be representative of a cluster of characteristics rather than important in themselves.

Because of the limited number of observations (50), we could use only three to four independent variables in each equation. Therefore, an exploratory analysis using bivariate correlation matrices and scattergrams was used to help narrow down the variables that appeared to be most related to and relevant for each performance indicator. The analysis looked at which of the independent variables were highly correlated with each other—both within clusters and between clusters—to avoid entering two highly correlated variables into an equation together. These are reported in Table 3. In particular, note that: (1) most of the variables in the funding category are highly correlated with each other (some are nearly identical in a statistical sense);

(2) per capita income is correlated with several of the funding variables; and (3) the percentage attending private, not-for-profit four-year institutions is highly correlated with several of the funding variables, including aid per student, average tuition and fees, and tuition revenue as a percentage of total revenue.

Table 3

Bivariate Correlations Among Independent Variables

(Bold = .500 or higher)

Within Funding Cluster									
	EXPGSP	***EXPSTUD***	***APPRINC***	***APPRCAP***	***WTPCTUIT***	***WTTFAV***	***AIDSTUD***	***SUBSRAT***	***SUBSDIFF***
EXPGSP	–								
EXPSTUD	0.197	–							
APPRINC	0.036	–0.483	–						
APPRCAP	–0.041	–0.196	**0.890**	–					
WTPCTUIT	0.023	**0.518**	**–0.778**	**–0.722**	–				
WTTFAV	0.045	**0.577**	**–0.712**	**–0.620**	**0.926**	–			
AIDSTUD	0.135	0.483	–0.498	–0.411	**0.731**	**0.812**	–		
SUBSRAT	0.101	0.056	–0.012	0.019	0.000	0.062	0.145	–	
SUBSDIFF	0.049	0.095	0.195	0.323	–0.294	–0.129	–0.019	**0.832**	–
RESEQUIT	–0.092	–0.360	0.486	0.453	**–0.587**	**–0.605**	**–0.509**	0.100	0.260

Within Economic/Demographic Cluster								
	PCPI	***POPUL***	***CHGGRADS***	***LESSHS***	***PCMINST***	***PCMETRO***	***PERPOV***	***GINI***
PCPI	–							
POPUL	0.309	–						
CHGGRADS	–0.085	0.149	–					
LESSHS	–0.355	0.259	–0.069	–				
PCMINST	0.072	0.409	**0.509**	0.352	–			
PCMETRO	**0.648**	**0.552**	0.074	0.062	0.430	–		
PERPOV	–0.472	0.341	0.142	**0.752**	0.489	–0.004	–	
GINI	–0.209	0.415	–0.075	**0.720**	0.429	0.254	**0.815**	–

Within Design Cluster					
	PCPUB2C	***PCPRIV4***	***PCMINHE***	***POPINST***	***PCTPT***
PCPUB2C	–				
PCPRIV4	–0.431	–			
PCMINHE	**0.506**	–0.175	–		
POPINST	0.395	–0.245	0.313	–	
PCTPT	**0.542**	–0.270	0.297	**0.580**	–

Table 3 (continued)

Bivariate Correlations Among Independent Variables

(Bold = .500 or higher)

Between Clusters (Selected Variables)									
		Economic/Demographic Cluster				*Design Cluster*			
		PCPI	***CHGGRADS***	***PCMINST***	***PCMETRO***	***PCPUB2C***	***PCPRIV4***	***PCMINHE***	***POPINST***
Funding Cluster	**EXPSTUD**	**0.685**	–0.376	–0.123	0.255	–0.211	0.400	–0.100	0.113
	APPRINC	**–0.636**	0.258	0.181	–0.453	0.279	**–0.599**	0.108	–0.163
	APPRCAP	–0.259	0.268	0.269	–0.223	0.419	**–0.541**	0.198	–0.038
	WTPCTUIT	0.475	**–0.578**	–0.374	0.220	–0.438	**0.833**	–0.283	–0.229
	WTTFAV	**0.514**	**–0.546**	–0.373	0.201	–0.432	**0.902**	–0.287	–0.235
	AIDSTUD	0.362	**–0.631**	–0.428	0.121	–0.332	**0.750**	–0.315	–0.233
	RESEQUIT	–0.311	**0.501**	0.349	–0.029	0.261	–0.397	0.335	0.247
Design Cluster	**PCPUB2C**	0.143	0.463	**0.501**	0.391	–	–	–	–
	PCPRIV4	0.400	–0.474	–0.281	0.220	–	–	–	–
	PCMINHE	0.107	0.436	**0.963**	0.448	–	–	–	–
	POPINST	0.322	0.319	0.362	**0.603**	–	–	–	–

The exploratory analysis also identified the variables that made sense as predictor variables in theoretical terms and had the strongest bivariate correlations with each performance measure. Table 4 (following page) shows the variables in each cluster that have the highest bivariate correlations with each performance measure.

The results of the exploratory analysis were used to choose the independent variables included in the equations for each performance measure. In most cases, two or more variables for a particular performance measure were highly correlated with each other; therefore, several equations were chosen using different combinations of the variables. Backward elimination regressions[3] were run on various combinations of three to four of these variables (given the correlations among the independent variables), for each performance measure. Combinations of variables were selected such that the variable(s) represented at least two of the clusters for each combination.

[3] The regression models were reduced in order to eliminate variables that did not add to each model's ability to explain the variation in the dependent variable. In the backward elimination method, all of the independent variables are entered, then at each step the variable that changes R-squared the least is removed. The procedure continues until the removal of any variable in the model results in a meaningful change in R-squared. "Stepped out" variables are those that were removed from the equation through this process.

Table 4

Variables with Relatively High Bivariate Correlations with the Performance Measures			
Performance Measure (Dependent Variable)	***Economic/Demographic Independent Variables***	***Design Independent Variables***	***Funding Independent Variables***
Preparation	PERPOV (–.634) PCPI (.605) GINI (–.478) PCMINST (–.304)	PCPRIV4 (.404)	EXPSTUD (.487) RESEQUIT (–.340)
Participation	PCPI (.548) PERPOV (–.433) LESSHS (–.397) GINI (–.336) PCMETRO (.318)	PCTPT (.265) PCPUB2C (.179)	EXPSTUD (.441) WTTFAV (.304)
Affordability		PCPRIV4 (–.448) PCPUB2C (.434) POPINST (.261)	APPRCAP (.650) WTPCTUIT (–.576) APPRINC (.515) WTTFAV (–.495) SUBSDIFF (.342)
Completion	PCPI (.357)	PCPRIV4 (.715) PCTPT (–.394) POPINST (–.323) PCMINHE (–.263)	WTTFAV (.748) WTPCTUIT (.740) AIDSTUD (.689) APPRINC (–.457)
Benefits	PCPI (.688) LESSHS (–.462) PCMETRO (.465) GINI (–.321)		EXPSTUD (.448) APPRINC (–.373) WTPCTUIT (.366)

Note: Correlation coefficients are in parentheses.

PRESENTATION OF THE "BEST" MODELS FOR EACH PERFORMANCE MEASURE

Below, we discuss the "best" predictive models—i.e., those using the combination of variables that gave the highest R-squared, which can be interpreted as "explaining" the most variance in the performance measure. The "best" models are shown in Tables 5 through 9.[4] It is important to keep in mind, however, that models using other

[4] The tables include the following statistics: (1) R-squared, which measures the percentage of the variation in the dependent variable (the grades) accounted for by the independent variables; (2) the regression coefficients, which indicate the estimate of the average amount the dependent variable changes (increasing or decreasing) with a unit change in each independent variable, after controlling for the other independent variables; (3) the probability

combinations of variables may have been quite close to the "best" model in terms of their predictive ability; these cases are discussed in the text where they are relevant to a complete understanding of the results.

According to the results for the preparation model (Table 5), 54 percent of the variation in the preparation grades (the dependent variable) is accounted for by the combination of three economic/demographic variables: per capita personal income, the percentage of minority students, and the index of income inequality in the state. Both the percentage of minority students and the GINI ratio have negative correlations with performance, meaning that higher levels of either are associated with lower grades. While it had a high bivariate correlation with preparation, the measure of total public elementary and secondary expenditures per student was "stepped out" in the regression as not significant. Again, these tests do not measure the relative influence of variables like academic preparation for college, since such measures are already embedded in the grade. The statistical test measures only the association of these external factors with the performance measured in the grades.

Table 5

Model for Preparation

Independent Variables	*Regression Coefficient*	*Portion of variation accounted for after controlling for other factors*	*Probability*
(Constant)	96.093	—	0.001
PCPI	0.001	14.2%	0.000
PCMINST	–17.362	3.9%	0.044
GINI	–125.863	5.2%	0.029
EXPSTUD	X	0.1%	—

R-squared = 0.539
Adjusted R-squared = 0.509
Model Significance = 0.000
N = 50

X = variable stepped out of equation
— = not applicable

The participation results (Table 6, following page) show that the model explains only 37 percent of the variation in the grades, the weakest "predictor" model for any graded area. Unlike the preparation grade, a combination of economic/demographic, design, and funding variables are associated with the dependent variable. It should be noted that, while this participation model had the highest predictive power of all combinations of variables tried, another model that used only the "per capita personal income" and "less than high school" variables also led to strong positive associations,

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for each independent variable, which indicates the probability that the relationship with the dependent variable is due to random factors; and (4) the portion of the variation in the dependent variable accounted for by an independent variable, controlling for the other factors (calculated by measuring the extent to which R-squared declines with the deletion of the variable from the model).

but with slightly lower predictive power. This suggests that the economic/ demographic variables tend to predict the most about variations in participation grades.

Table 6

Model for Participation

R-squared = 0.369
Adjusted R-squared = 0.327
Model Significance = 0.000
N = 50

Independent Variables	*Regression Coefficient*	*Portion of variation accounted for after controlling for other factors*	*Probability*
(Constant)	113.252	—	0.000
GINI	–166.757	12.1%	0.011
EXPSTUD	0.004	10.1%	0.001
PCPUB2C	24.700	4.6%	0.007
PCMETRO	X	3.3%	—

X = variable stepped out of equation
— = not applicable

The results from the affordability model (Table 7) show that both funding and design variables (per capita appropriations and the number of institutions per population) account for about half of the variation in state grades. The other design measure, enrollments in private not-for-profit four-year institutions, was stepped out of the equation despite its high bivariate positive correlation with affordability. Although the tuition and financial aid variables were not significant in the "best" model, relatively high bivariate correlations among the funding variables suggest that per capita appropriations may be representative of a pattern of characteristics.

Table 7

Model for Affordability

R-squared = 0.504
Adjusted R-squared = 0.483
Model Significance = 0.000
N = 50

Independent Variables	*Regression Coefficient*	*Portion of variation accounted for after controlling for other factors*	*Probability*
(Constant)	34.041	—	0.000
APPRCAP	0.146	28.0%	0.000
POPINST	0.000	6.9%	0.008
PCPRIV4	X	0.1%	—

X = variable stepped out of equation
— = not applicable

The completion model (Table 8) shows that a combination of funding, design and economic/demographic factors explain close to 64 percent of the variation in grades—the highest value for any of the models. Higher average tuition levels are positively associated with higher completions and have the strongest relationship in the model, whereas the percentage of part-time students is negatively associated with completions. Although the tuition variable led to the "best" predictive model, the use

of other funding variables—as well as the percentage of students enrolled in private, not-for-profit four-year institutions—led to models almost as powerful.

Table 8

Model for Completion			
Independent Variables	*Regression Coefficient*	*Portion of variation accounted for after controlling for other factors*	*Probability*
(Constant)	70.551	—	0.000
WTTFAV	0.002	15.0%	0.000
PCTPT	–43.210	8.4%	0.002
PCPI	0.001	2.6%	0.076

R-squared = 0.644
Adjusted R-squared = 0.621
Model Significance = 0.000
N = 50

X = variable stepped out of equation
— = not applicable

The results of the benefits model (Table 9) indicate that slightly over half of the variation between states is attributable to two economic/demographic variables—per capita personal income and the percentage of the population without a high school certificate. None of the design or funding variables associated specifically with postsecondary education were found to be significant in the model for benefits.

Table 9

Model for Benefits			
Independent Variables	*Regression Coefficient*	*Portion of variation accounted for after controlling for other factors*	*Probability*
(Constant)	49.893	—	0.000
PCPI	0.001	20.4%	0.000
LESSHS	–60.661	5.8%	0.024
WTPCTUIT	X	0.6%	—

R-squared = 0.527
Adjusted R-squared = 0.507
Model Significance = 0.000
N = 50

X = variable stepped out of equation
— = not applicable

DISCUSSION OF MODEL RESULTS

These findings support the notion that there are different kinds of "drivers" for the different report card performance areas. Economic/demographic variables have the greatest associations with the measures of preparation and benefits, which are also highly correlated with each other. To a lesser extent, economic/demographic variables also are associated with performance in participation and completion. System design and funding variables play a more important role for participation, completion, and affordability. Surprisingly, economic/demographic variables do not

account for the state-level variations in the affordability measure.

Unraveling the relative influences among the design and funding measures is difficult because there is so much inter-correlation between them, suggesting that many of these factors tend to occur together. For the purposes of this analysis, we could only choose one or two from this set of variables for each equation, so it is important to keep in mind that a variable may be symbolic of a whole "system" of characteristics rather than important in itself. It is interesting that the different funding measures—including measures of subsidy patterns, pricing, and state aid—are all close to one another in a statistical sense. This may indicate that the total availability of resources is more important than the means of delivering subsidies (whether through students or institutions). It is a preliminary result worth greater exploration.

The statistical tests may reveal as much for what they do *not* show as for the "positive" results. For all of the models except completion, close to half of the variation between states appears to be driven by factors other than economic/demographic characteristics, funding, or design. This means that something not captured by these simple measures is responsible for one-half of the measured performance differences between the states. Intangibles such as leadership, history, and governance seem to play important roles, but are difficult to measure. The percentage of minorities in the population is another "non-result," as that measure is weakly negatively correlated with preparation and completion, but is not a major predictor of performance for any measure. In addition, although average tuition and fees (a measure that includes both public and private institutions) and financial aid (a measure that includes institutional aid) are positively correlated with participation, both were "stepped out" in the regression equations—when all other factors are taken into account, these are no longer predictors of performance. This suggests that while tuition and aid levels may be important at individual institutions, they are not as important in influencing college participation at the aggregate statewide level as other economic/demographic, funding, and design variables.

The regression results for the completion variables are a good example of another problem with statistical data, which is that the interrelationship of variables does not show the direction of causality for any measure. The regression shows that the three factors associated with completion are average tuition and fees (positively associated with completion), percentage of part-time students (negatively related to completion), and per capita personal income. This probably doesn't tell us much more than what is already commonly known in higher education, i.e., the students who attend higher-priced institutions on a full-time basis are more likely to complete their college degrees. Whether this is due to higher tuition, or because they are more academically prepared and motivated to finish college, cannot be determined with these data.

Predicted versus Expected Values

One other type of statistical test was administered using these data, which was to look at the variation between the measures of performance that might be predicted by the "best" models, and to compare these to the actual values calculated by the National Center (see Table 10). When reading this table, it is necessary to recall that the indexed score was used in the models, not the grades, which is why a state with an F or A grade can still show up as receiving a higher/lower grade than would have been predicted. When the actual values are higher than the predicted values, it suggests that the state may be using policy levers not captured in these models, but which affect its performance. Future research may want to look at these "better-than-expected" states in more detail to see if there is evidence of such policy interventions.

Table 10

Predicted Values Vs. Actual Performance Measures

States that received a higher grade than predicted (top five)	
Preparation	Alabama, Indiana, Nevada, Oregon, Wyoming
Participation	Arkansas, Georgia, Nevada, Oregon, South Carolina
Affordability	Alabama, Arkansas, Hawaii, Oregon, Rhode Island
Completion	Arkansas, Kentucky, Massachusetts, Montana, Nevada
Benefits	Florida, Nevada, North Carolina, West Virginia, Wyoming

States that received a lower grade than predicted (top five)	
Preparation	Illinois, Montana, Nebraska, New Jersey, Utah
Participation	Delaware, Illinois, Kansas, Massachusetts, Nebraska
Affordability	California, Colorado, Illinois, Minnesota, Utah
Completion	Florida, Iowa, Kansas, North Carolina, Wyoming
Benefits	Colorado, Maryland, Montana, Rhode Island, South Carolina

Note: Predicted values are those predicted by the final models for each performance measure. State grades are based on index scores.

For example, for the performance measures most associated with economic/demographic factors (preparation, participation, benefits)—which may be postulated as largely outside the state's control, at least in the short term—several states (in particular, Nevada, Oregon, and Wyoming) have higher values than were predicted, suggesting that policy decisions may be being used to counteract or improve upon economic/demographic circumstances. In the cases of affordability and completion, states—such as Arkansas—that do better than predicted by the funding and/or design variables may be using interventions not captured in these models.

Policy Conclusions and Suggestions for Future Research

Statistical analysis is just one of the many avenues of inquiry that can yield insights into the utility and meaning of *Measuring Up 2000*. These limited results must be supplemented with different kinds of inquiries to guide state and institutional policymakers to more fundamental conclusions about the basis for their different grades. Nonetheless, the results presented here do suggest several conclusions about the nature of *Measuring Up 2000*, and the face and content values of the grades.

1. Demography is not destiny. While demographic and environmental factors are among the strongest predictors of state-level higher education performance, they only explain around half of the variation between the states in the preparation and benefits measures, and even less in the other areas. This is a potentially important finding about the extent to which state-level performance is susceptible to change at the hands of policymakers. It suggests that demographic influences are powerful, but that a good half of performance is associated with individual and institutional influences that are susceptible to change through decisions about system design and finance. The "expected-predicted" analysis shows that several of the poorer states (Arkansas, Alabama, South Carolina) do better on several of the measures than would be predicted based on their state characteristics. Understanding what policies are in place in these states to influence their grades is a good starting place for further research into the factors that influence performance.

2. Aiming policy to improve performance. Analyses suggest that there are major differences between the graded areas in *Measuring Up 2000,* whether they are driven by environmental/demographic, funding, or system design. The performance measures that were selected for the report card point to economic and demographic characteristics as most strongly related to performance in the graded areas of preparation and benefits. If this result is "correct," it suggests that policies designed to improve performance in these areas will succeed if they connect education with other aspects of social and economic policy. Affordability similarly requires attention to both structure and funding. The results for participation and completion show that all three mega-drivers (economic, design, and funding) combine to influence performance, which suggests that a combination of policy strategies—for example, attention to academic preparation, diverse institutional funding options, tuition and financial aid—must be used to influence statewide performance in increasing college participation and completion. Addressing these solely through changes in any one variable (by changing institutional missions or structures, or through funding) will fail to highlight the connections between the influences.

3. No state is an island. The inherent difficulty of the state as the unit of analysis is particularly evident in the "benefits" measure, where there is a weak accountability relation between the measure and the institutional performance of higher education within the state. The data suggest that economic and demographic variables are the most important influences on "benefits" from higher education. Yet the geographic location of the state, and its proximity to other states and to regional centers of commerce, can be responsible for drawing educated citizens to the state. State higher education policy is only tangentially related to these kinds of broad-brush benefits. This is an area the National Center should continue to invest in to find better

measures of the direct relationship between higher education performance and civic, social, and economic benefits.

4. The problem of statewide measures in relation to policy interventions. Statistical techniques can only point to gross performance indicators, and do not reveal much about deeper influences on performance. The fact that *Measuring Up 2000* has only 50 observations further severely limits the number of variables that can be included in any equation. The data presented in this analysis suggest that characteristics not measurable in statewide data account for about one-half of the variation in most of the performance measures. To get a better understanding of the details behind the data would require delving into aggregate data for individual institutional measures of performance. Institutional and sector data, and more detailed regional data, could show more potential influences on performance, such as staffing ratios within the institutions, student admissions policies, or institutional governance structures. However, comparable institutional data that allow this kind of disaggregation do not exist, and although the research would be interesting, it would be very time consuming and would distract attention from a focus on state policy.

Future Directions

The results also suggest possible directions for future policy research. Using the statistical models presented in this paper is only one way to begin to understand the basis for the state performance in *Measuring Up 2000,* and it is probably not the best way to present information digestible to policymakers. Nonetheless, this type of analysis can suggest avenues for further research that are more relevant to state decision-makers. For instance, the statistical technique described in this paper could be applied to the sub-components of the five graded areas with results that are more likely to have traction for state policy audiences. As an example, measures of public college pricing and need-based financial aid are buried within the "affordability" measure. It would be instructive to see if performance in these areas are linked to the drivers used in this analysis. The statistical analysis could also be used as a point of departure for qualitative research on the reasons for differences between states. This type of inquiry could reveal individual, organizational and political reasons that underlie some of the performance differences. The goal of such analyses would be to peel back the layers of the core questions behind *Measuring Up 2000*: how best to measure and improve state performance in higher education.

Appendix I

Preliminary Measures Organized into Clusters of Influence

Economic/demographic Cluster

PCPI: Per capita personal income, 2000 (Bureau of Economic Affairs).

POPUL: State population, 1998–99 (National Center for Public Policy and Higher Education, *Measuring Up 2000*).

CHGGRADS: Projected percentage change in the number of all high school graduates, 1999–2010 (National Center for Public Policy and Higher Education, *Measuring Up 2000*).

LESSHS: Percentage of the state population with less than a high school diploma or its equivalent (generated by the National Center for Public Policy and Higher Education based on U.S. Census Bureau, *Current Population Surveys*, 1998 supplements).

PCMINST: Percentage of the state population that is non-white, 1998–99 (National Center for Public Policy and Higher Education, *Measuring Up 2000*).

PCMETRO: Percentage of households in the state living in metropolitan areas, 1998 (U.S. Census Bureau, *Statistical Abstract*).

PERPOV: Percentage of children living in poverty, 1997 (Annie E. Casey Foundation, *Kids Count,* 2001).

GINI: Gini Ratio, 1998 (U.S. Census Bureau). This statistic summarizes the dispersion of income shares across the whole income distribution, where 0 = perfect equity.

Design Cluster

PCPUB2C: Percentage of undergraduates in the state enrolled at public two-year institutions, fall 1998 (U.S. Department of Education, *Digest of Education Statistics, 2000*).

PCPRIV4: Percentage of undergraduates in the state enrolled at private four-year institutions, fall 1998 (U.S. Department of Education, *Digest of Education Statistics, 2000*).

PCMINHE: Percentage of non-white students enrolled in higher education, 1998–99 (National Center for Public Policy and Higher Education, *Measuring Up 2000)*.

POPINST: State population per higher education institutions in the state, 1998–99 (National Center for Public Policy and Higher Education, *Measuring Up 2000*).

PCTPT: Percentage of part-time students enrolled in postsecondary education, 1996 (National Center for Public Policy and Higher Education, *Measuring Up 2000)*.

Funding Cluster

EXPGSP: Education spending in 1998 per $1,000 in state wealth (gross state product) (*Education Week,* "Quality Counts 2001").

EXPSTUD: Unadjusted education spending in 1999, per public elementary and secondary student (*Education Week,* "Quality Counts 2001").

APPRINC: State and local appropriations for higher education per $1,000 of personal income, FY 1999 (National Center for Public Policy and Higher Education, *Measuring Up 2000)*.

APPRCAP: State and local appropriations for higher education, per capita, FY 1999 (National Center for Public Policy and Higher Education, *Measuring Up 2000)*.

WTPCTUIT: Gross tuition revenues as a percentage of total education and general revenues, weighted by FTE students, 1995–96, for public two- and four-year institutions and private, not-for-profit four-year institutions in the state (Integrated Postsecondary Education Data System, analysis by the Institute for Higher Education Policy).

WTTFAV: Average undergraduate in-state tuition and fees, weighted by FTE undergraduates, 1995–96, for public two and four-year institutions and private, not-for-profit four-year institutions in the state (Integrated Postsecondary Education Data System, analysis by the Institute for Higher Education Policy).

AIDSTUD: Average institutional and state aid per FTE student, 1995–96, for public two- and four-year institutions and private, not-for-profit four-year institutions in the state (Integrated Postsecondary Education Data System, analysis by the Institute for Higher Education Policy). This hypothetical average is for all students, using state and all other forms of institutional aid, excluding federal aid.

SUBSRAT: Ratio of the average subsidy (education and general revenue less tuition revenue) per FTE student for public research/doctoral institutions in the state, to average subsidies for public two-year institutions in the state, 1995–96 (Integrated Postsecondary Education Data System, analysis conducted by the Institute for Higher Education Policy).

SUBSDIFF: Average difference between the subsidies described above (Integrated Postsecondary Education Data System, analysis by the Institute for Higher Education Policy).

RESEQUIT: Index of resource equity among K–12 school districts (*Education Week*, "Quality Counts 2001").

Appendix II

Final Variables Used in Analysis

	Economic/Demographic Cluster								Design Cluster				
State	*PCPI*	*POPUL*	*CHGGRADS*	*LESSHS*	*PCMINST*	*PCMETRO*	*PERPOV*	*GINI*	*PCPUB2C*	*PCPRIV4*	*PCMINHE*	*POPINST*	*PCTPT*
AL	$23,471	4,369,862	11%	21%	28%	70%	24%	0.458	35%	11%	28%	55,315	30%
AK	$30,064	619,500	21%	9%	28%	42%	16%	0.397	3%	3%	12%	77,438	58%
AZ	$25,578	4,778,332	21%	18%	32%	88%	23%	0.439	61%	7%	17%	71,318	52%
AR	$22,257	2,551,373	11%	23%	19%	49%	25%	0.450	33%	10%	19%	54,285	35%
CA	$32,275	33,145,121	27%	20%	49%	97%	25%	0.441	66%	9%	49%	83,700	52%
CO	$32,949	4,056,133	16%	10%	21%	84%	15%	0.426	37%	11%	19%	57,945	45%
CT	$40,640	3,282,031	7%	16%	19%	96%	15%	0.434	33%	33%	18%	78,144	46%
DE	$31,255	753,538	8%	15%	25%	82%	15%	0.411	32%	15%	20%	75,354	42%
FL	$28,145	15,111,244	21%	18%	31%	93%	22%	0.450	53%	14%	34%	107,937	51%
GA	$27,940	7,788,240	17%	20%	33%	69%	23%	0.446	27%	20%	32%	74,887	32%
HI	$28,221	1,185,497	24%	15%	71%	73%	16%	0.408	46%	23%	73%	59,275	42%
ID	$24,180	1,251,700	20%	17%	10%	38%	17%	0.421	16%	4%	7%	83,447	32%
IL	$32,259	12,128,370	6%	16%	28%	85%	18%	0.440	55%	20%	29%	70,514	48%
IN	$27,011	5,942,901	6%	17%	12%	72%	15%	0.411	16%	21%	12%	61,905	33%
IA	$26,723	2,869,413	3%	12%	5%	45%	14%	0.412	39%	28%	7%	44,835	31%
KS	$27,816	2,654,052	10%	11%	13%	56%	15%	0.428	46%	9%	14%	44,984	45%
KY	$24,294	3,960,825	6%	22%	9%	48%	23%	0.456	26%	16%	10%	62,870	33%
LA	$23,334	4,372,035	9%	21%	36%	75%	26%	0.476	22%	11%	33%	51,436	29%
MN	$25,623	1,253,040	8%	13%	2%	36%	15%	0.414	16%	27%	5%	35,801	43%
MD	$33,872	5,171,634	11%	15%	35%	93%	15%	0.410	48%	11%	33%	89,166	50%
MA	$37,992	6,175,169	6%	14%	15%	96%	17%	0.428	24%	49%	19%	47,870	36%
MI	$29,612	9,863,775	3%	15%	19%	83%	18%	0.429	41%	16%	18%	89,671	48%
MN	$32,101	4,775,508	9%	11%	8%	70%	13%	0.418	36%	17%	9%	41,526	37%
MS	$20,993	2,768,619	8%	23%	38%	36%	25%	0.475	49%	7%	33%	60,187	26%
MO	$27,445	5,468,338	8%	17%	14%	68%	18%	0.438	29%	30%	14%	48,824	42%
MT	$22,569	882,779	13%	11%	9%	33%	21%	0.421	17%	10%	11%	31,528	23%
NE	$27,829	1,666,028	9%	12%	10%	52%	13%	0.414	37%	18%	9%	45,028	38%
NV	$30,529	1,809,253	17%	11%	29%	86%	15%	0.42	62%	2%	25%	129,232	65%
NH	$33,332	1,201,134	12%	16%	3%	60%	10%	0.387	14%	42%	6%	46,197	38%
NJ	$36,983	8,143,412	9%	14%	31%	100%	15%	0.431	44%	15%	31%	138,024	45%
NM	$22,203	1,739,844	24%	20%	52%	57%	28%	0.448	55%	5%	46%	39,542	49%
NY	$34,547	18,196,601	4%	19%	35%	92%	25%	0.467	29%	36%	32%	57,043	35%
NC	$27,194	7,650,789	14%	19%	27%	67%	19%	0.430	45%	17%	26%	63,230	37%
ND	$25,068	633,666	6%	16%	7%	43%	17%	0.409	24%	10%	8%	30,175	19%
OH	$28,400	11,256,654	2%	14%	14%	81%	16%	0.427	31%	21%	14%	63,597	37%
OK	$23,517	3,358,044	12%	15%	20%	61%	24%	0.445	39%	10%	22%	73,001	39%
OR	$28,350	3,316,154	18%	15%	12%	73%	16%	0.421	52%	13%	13%	61,410	45%
PA	$29,539	11,994,016	2%	16%	14%	85%	17%	0.435	20%	34%	15%	47,407	31%
RI	$29,685	990,819	7%	19%	13%	94%	17%	0.420	24%	49%	14%	82,568	35%
SC	$24,321	3,885,736	13%	21%	32%	70%	23%	0.428	41%	16%	27%	63,701	35%
SD	$26,115	733,133	8%	14%	10%	34%	19%	0.394	15%	18%	9%	29,325	26%
TN	$26,239	5,483,535	13%	23%	19%	68%	19%	0.451	35%	19%	19%	66,067	33%
TX	$27,871	20,044,141	21%	22%	44%	85%	24%	0.457	51%	10%	38%	108,936	45%
UT	$23,907	2,129,836	21%	11%	11%	77%	13%	0.395	21%	24%	7%	101,421	38%
VT	$26,901	593,740	7%	13%	2%	28%	13%	0.385	14%	40%	5%	23,750	30%
VA	$31,162	6,872,912	13%	17%	27%	78%	17%	0.425	42%	15%	26%	74,706	43%
WA	$31,528	5,756,361	21%	8%	17%	83%	15%	0.414	61%	10%	19%	79,949	41%
WV	$21,915	1,806,928	1%	24%	4%	42%	25%	0.448	9%	13%	7%	53,145	30%
WI	$28,232	5,250,446	7%	12%	10%	68%	14%	0.402	40%	16%	10%	79,552	38%
WY	$27,230	479,602	22%	10%	9%	30%	15%	0.395	65%	0%	8%	53,289	44%

Sources: For a description of the measures and of the data sources used for the measures, please see Appendix I.

Appendix II (continued)

Final Variables Used in Analysis										
	Funding Cluster									
State	*EXPGSP*	*EXPSTUD*	*APPRINC*	*APPRCAP*	*WTPCTUIT*	*WTTFAV*	*AIDSTUD*	*SUBSRAT*	*SUBSDIFF*	*RESEQUIT*
AL	$36	$5,022	$12	$239	27%	$2,448	$804	4.22	$17,485	74
AK	$44	$8,543	$11	$278	19%	$2,522	$341	2.23	$18,464	75
AZ	$35	$4,643	$11	$236	25%	$2,261	$363	2.15	$7,354	68
AR	$40	$4,876	$11	$219	25%	$2,305	$991	2.02	$7,918	80
CA	$34	$5,845	$10	$268	22%	$2,440	$1,280	3.20	$14,997	78
CO	$33	$5,749	$7	$177	37%	$2,801	$710	1.41	$2,687	77
CT	$37	$9,321	$5	$192	47%	$7,075	$1,709	1.90	$7,494	63
DE	$27	$7,684	$8	$227	43%	$3,730	$582	1.20	$1,634	80
FL	$36	$5,750	$7	$168	25%	$2,351	$923	2.31	$7,268	78
GA	$37	$5,848	$8	$194	27%	$3,843	$1,355	3.14	$15,433	75
HI	$31	$6,003	$11	$268	29%	$2,197	$176	3.53	$14,176	100
ID	$42	$4,889	$11	$224	22%	$2,205	$1,084	1.29	$2,700	78
IL	$34	$5,968	$9	$240	31%	$5,309	$1,500	2.24	$7,662	55
IN	$44	$6,689	$8	$195	39%	$5,225	$1,968	2.19	$6,983	69
IA	$39	$6,286	$12	$284	35%	$4,728	$2,745	2.77	$13,131	77
KS	$41	$5,938	$12	$278	27%	$2,480	$956	1.77	$4,780	80
KY	$36	$5,970	$11	$226	30%	$3,230	$2,073			78
LA	$32	$5,408	$8	$171	34%	$3,284	$917	1.76	$3,661	73
MN	$49	$6,881	$7	$161	40%	$6,297	$1,455	2.01	$8,325	68
MD	$40	$6,935	$6	$183	37%	$4,546	$1,325	2.06	$7,067	55
MA	$34	$7,910	$5	$163	55%	$10,342	$2,679	1.51	$3,743	73
MI	$49	$7,106	$9	$223	36%	$4,118	$1,241	2.61	$10,135	72
MN	$42	$7,240	$10	$262	35%	$4,875	$1,898	3.68	$19,045	76
MS	$35	$4,570	$16	$286	24%	$2,199	$828	1.92	$6,426	71
MO	$37	$5,387	$8	$184	40%	$4,865	$1,579	2.09	$6,062	60
MT	$48	$5,953	$9	$167	32%	$3,135	$741	1.28	$2,007	57
NE	$38	$6,170	$13	$296	31%	$3,651	$1,263	1.93	$7,020	67
NV	$32	$5,447	$7	$166	21%	$1,425	$304	3.58	$15,630	86
NH	$34	$6,746	$3	$78	65%	$9,359	$2,009			52
NJ	$43	$9,986	$6	$198	39%	$5,249	$1,650	3.05	$11,348	62
NM	$37	$5,450	$17	$324	12%	$1,543	$603	2.54	$12,158	84
NY	$40	$9,167	$6	$183	43%	$6,299	$2,447	2.66	$10,513	55
NC	$30	$5,444	$13	$301	22%	$2,872	$1,231	2.63	$12,962	74
ND	$38	$5,531	$13	$269	31%	$2,874	$812	2.95	$8,454	63
OH	$40	$6,221	$8	$180	44%	$5,319	$1,740	1.80	$4,104	58
OK	$41	$5,518	$11	$223	23%	$1,729	$489	1.78	$5,433	83
OR	$37	$6,361	$8	$195	35%	$4,015	$1,367	1.19	$1,768	72
PA	$12	$7,599	$6	$155	52%	$8,356	$2,275	2.67	$9,413	60
RI	$43	$7,929	$6	$151	56%	$9,551	$2,193	2.27	$6,123	69
SC	$40	$5,594	$10	$206	36%	$3,536	$1,262	1.98	$6,104	75
SD	$35	$5,271	$8	$171	31%	$3,996	$939			70
TN	$30	$5,026	$8	$174	31%	$3,421	$1,379	1.80	$4,353	68
TX	$37	$5,688	$9	$198	29%	$2,515	$729	1.66	$4,427	81
UT	$39	$3,866	$12	$234	21%	$2,057	$508	2.68	$11,843	89
VT	$54	$7,326	$4	$100	63%	$9,757	$2,714	4.67	$11,062	56
VA	$35	$6,850	$7	$191	40%	$4,369	$1,661	2.26	$6,184	66
WA	$37	$6,049	$8	$201	30%	$3,084	$1,328	4.04	$16,630	79
WV	$53	$7,456	$11	$200	32%	$3,135	$1,646	2.95	$9,379	79
WI	$46	$7,505	$11	$262	33%	$4,103	$1,676	1.82	$8,627	75
WY	$37	$7,192	$14	$321	15%	$1,392	$280	2.35	$9,506	74

Sources: For a description of the measures and of the data sources used for the measures, please see Appendix I.

ABOUT THE AUTHORS

Alisa F. Cunningham is director of research at The Institute for Higher Education Policy, a nonprofit, non-partisan research and policy group located in Washington, D.C. She has served as project director for several research projects on higher education finance, student financial aid, and minority-serving institutions. Before joining the Institute she worked for the American Enterprise Institute in Washington, D.C., and the Bonn International Center for Conversion in Germany. She has authored or co-authored several studies on higher education, including most recently *Study of College Costs and Prices,* and *Building Strong Communities: Tribal Colleges as Engaged Institutions*. She has a bachelor's degree from Villanova University and a master's degree from George Washington University.

Jane V. Wellman is a senior associate with The Institute for Higher Education Policy. She is a director of several of The Institute's research and policy efforts, including The New Millennium Project, a national study of higher education renewal strategies; the "Seat-Time" study of uses and alternatives to the student credit hour unit of measurement; and a national study of trends in costs and prices. She is the author or co-author of several recent publications by the Institute on higher education costs, finance, and public policy. In addition to research and writing, she consults with state systems and national associations on major projects, and is a consulting editor for several publications. Wellman has worked for over 20 years in higher education and government relations at the federal and state levels and with public and private institutions. She has a bachelor's and master's degree from the University of California at Berkeley.

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152 North Third Street, Suite 705, San Jose, California 95112
Telephone: 408-271-2699 • FAX: 408-271-2697
E-mail: center@highereducation.org • Web site: **www.highereducation.org**

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Measuring Up 2000: The State-by-State Report Card for Higher Education (November 2000, #00-3). This first-of-its-kind report card grades each state on its performance in higher education. The report card also provides comprehensive profiles of each state and brief states-at-a-glance comparisons. Visit **www.highereducation.org** to download *Measuring Up 2000* or to make your own comparisons of state performance in higher education. Printed copies are available for $25.00 by calling 888-269-3652 (discounts available for large orders).

Beneath the Surface: A Statistical Analysis of the Major Variables Associated with State Grades in Measuring Up 2000, by Alisa F. Cunningham and Jane V. Wellman (November 2001, #01-04). Using statistical analysis, this report explores the "drivers" that predict overall performance in *Measuring Up 2000*.

Supplementary Analysis for Measuring Up 2000: An Exploratory Report, by Mario Martinez (November 2001, #01-03). Explores the relationships within and between the performance categories in *Measuring Up 2000*.

Some Next Steps for States: A Follow-up to Measuring Up 2000, by Dennis Jones and Karen Paulson (June 2001, #01-2). What are the next steps states can take to improve performance in higher education? This report provides an introduction to the kinds of actions states can take to bridge the gap between the performance areas identified in *Measuring Up 2000* and the formulation of effective policy.

A Review of Tests Performed on the Data in Measuring Up 2000, by Peter Ewell (June 2001, #01-1). Describes the statistical testing performed on the data in *Measuring Up 2000* by the National Center for Higher Education Management Systems.

Recent State Policy Initiatives in Education: A Supplement to Measuring Up 2000, by Aims McGuinness, Jr. (December 2000, #00-6). Highlights education initiatives that states have adopted since 1997–98.

Assessing Student Learning Outcomes: A Supplement to Measuring Up 2000, by Peter Ewell and Paula Ries (December 2000, #00-5). National survey of state efforts to assess student learning outcomes in higher education.

Technical Guide Documenting Methodology, Indicators and Data Sources for Measuring Up 2000 (November 2000, #00-4).

A State-by-State Report Card on Higher Education: Prospectus (March 2000, #00-1). Summarizes the goals of the National Center's report card project.

Great Expectations: How the Public and Parents—White, African American and Hispanic—View Higher Education, by John Immerwahr with Tony Foleno (May 2000, #00-2). This report by Public Agenda finds that Americans overwhelmingly see higher education as essential for success. Survey results are also available for the following states:

Great Expectations: How Pennsylvanians View Higher Education (May 2000, #00-2b)
Great Expectations: How Floridians View Higher Education (August 2000, #00-2c)
Great Expectations: How Coloradans View Higher Education (August 2000, #00-2d)
Great Expectations: How Californians View Higher Education (August 2000, #00-2e)
Great Expectations: How New Yorkers View Higher Education (October 2000, #00-2f)
Great Expectations: How Illinois Residents View Higher Education (October 2000, #00-2h)

State Spending for Higher Education in the Next Decade: The Battle to Sustain Current Support, by Harold A. Hovey (July 1999, #99-3). This fiscal forecast of state and local spending patterns finds that the vast majority of states will face significant fiscal deficits over the next eight years, which will in turn lead to increased scrutiny of higher education in almost all states, and to curtailed spending for public higher education in many states.

South Dakota: Developing Policy-Driven Change in Higher Education, by Mario Martinez (June 1999, #99-2). Describes the processes for change in higher education that government, business and higher education leaders are creating and implementing in South Dakota.

Taking Responsibility: Leaders' Expectations of Higher Education, by John Immerwahr (January 1999, #99-1). Reports the views of those most involved with decision-making about higher education, based on a survey and focus groups conducted by Public Agenda.

The Challenges and Opportunities Facing Higher Education: An Agenda for Policy Research, by Dennis Jones, Peter Ewell, and Aims McGuinness (December 1998, #98-8). Argues that due to substantial changes in the landscape of postsecondary education, new state-level policy frameworks must be developed and implemented.

Higher Education Governance: Balancing Institutional and Market Influences, by Richard C. Richardson, Jr., Kathy Reeves Bracco, Patrick M. Callan, and Joni E. Finney (November 1998, #98-7). Describes the structural relationships that affect institutional effectiveness in higher education, and argues that state policy should strive for a balance between institutional and market forces.

Federal Tuition Tax Credits and State Higher Education Policy: A Guide for State Policy Makers, by Kristin D. Conklin (December 1998, #98-6). Examines the implications of the federal income tax provisions for students and their families, and makes recommendations for state higher education policy.

The Challenges Facing California Higher Education: A Memorandum to the Next Governor of California, by David W. Breneman (September 1998, #98-5). Argues that California should develop a new Master Plan for Higher Education.

Tidal Wave II Revisited: A Review of Earlier Enrollment Projections for California Higher Education, by Gerald C. Hayward, David W. Breneman and Leobardo F. Estrada (September 1998, #98-4). Finds that earlier forecasts of a surge in higher education enrollments were accurate.

Organizing for Learning: The View from the Governor's Office, by James B. Hunt Jr., chair of the National Center for Public Policy and Higher Education, and former governor of North Carolina (June 1998, #98-3). An address to the American Association for Higher Education concerning opportunity in higher education.

The Price of Admission: The Growing Importance of Higher Education, by John Immerwahr (Spring 1998, #98-2). A national survey of Americans' views on higher education, conducted and reported by Public Agenda.

Concept Paper: A National Center to Address Higher Education Policy, by Patrick M. Callan (March 1998, #98-1). Describes the purposes of the National Center for Public Policy and Higher Education.