

The Impact of State Governance Structures on Management and Performance of Public Organizations: A Study of Higher Education Institutions

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Abstract

Legislative statutes are passed by political majorities which support structures that insulate the implementing agency from its political opponents over time. Political actors also respond to different constituencies. Depending on the broad or narrow base of these constituencies, actors favor different kinds of governance structures. We apply this theoretical framework to the question of whether the state governance structures of boards of higher education affect the way university managers allocate resources, develop sources of revenue, and promote research and undergraduate education. Over the past two decades state governments have given considerable attention to state governance issues, resulting in many universities operating in a more regulated setting today. This paper develops a classification of higher education structures and shows the effects of differences in these structures on university management and performance using a data set that covers the period from 1987 to 1998. The analysis suggests that, for most of the measures, productivity and resources are higher at universities with a statewide board that is more decentralized and has fewer regulatory powers. © 2004 by the Association for Public Policy Analysis and Management.

INTRODUCTION

The current downturn in the economy has produced sharp declines in budget revenues with continued spending pressures, including growth in Medicaid and corrections. Many states now face budget deficits larger than any deficits since the Great Depression. As a consequence, states like Virginia, Illinois, Arizona, Florida, California, and others are proposing substantial cuts in state appropriations for their public universities. In some of these states, boards of higher education are resisting tuition increases to offset this decline in appropriations. Such an unfavorable financial picture following upon years of declining state appropriations as a share of total revenues has caused some public universities to advocate for greater autonomy to compete for students and resources more like private institutions. One example is Miami University of Ohio, which has proposed to more than double its in-state tuition to equal its out-of-state tuition rate. In Colorado, the state government has considered introducing a voucher system for higher education that would eliminate state appropriations for public universities. Other universities are concerned about the effect of autonomy on access to students of different incomes, the goal of serving a diverse population, and a broader public mission.

Manuscript received November 2002; review completed January 2003; revisions completed May 2003; accepted July 2003.

Journal of Policy Analysis and Management, Vol. 23, No. 1, 13–30 (2004)

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Published by Wiley Periodicals, Inc. Published online in Wiley InterScience (www.interscience.wiley.com)

DOI: 10.1002/pam.10176

Is there empirical evidence that governance structures might make a difference for the choices that university administrators have for raising revenues and for encouraging research, teaching, and other activities within the university? While the governance structure is only one part of a much broader policy and political process that determines state budgets and policy priorities, governance may play an important role in the distribution of resources and in promoting different incentives among university managers.

A growing body of literature in economics and political science demonstrates that governance structures make a difference for the management and performance of public agencies (Heinrich and Lynn, 2000). Political actors in the legislature design public agencies, commissions, and boards in ways that reflect the political compromises of the enacting legislative coalition. Political actors also face uncertainty about who will hold the reins of power in the future. This uncertainty gives the enacting coalition an incentive to design organizations in ways that protect the activities of the agency from their political opponents (Horn and Shepsle, 1989; McCubbins, Noll, and Weingast, 1987, 1989). Different actors in the governance system also favor agency structures that respond to different constituencies (Moe 1989, 1990). These design features, while serving important governance needs, may not make much sense for efficient and effective management and implementation of agency goals and are likely to favor one set of interests and policy goals over others. In this article, we explain how this logic of governance (Heinrich and Lynn, 2002) affects the management and performance of public higher education institutions, using data for universities in the 48 states between 1987 and 1998. The analysis shows that, for most of the measures, resources and scholarly productivity are higher at universities with a statewide board that is more decentralized. This is particularly true with respect to measures of total revenue, tuition revenue, tuition rates, state appropriations, endowment, research funding, and academic publications. The time-invariant aspects of the universities, such as whether they are a Ph.D.-granting institution or have a medical school, also determine much of the variation in resources.

HIGHER EDUCATION AND GOVERNANCE SYSTEMS

The support for public universities by policymakers and citizens has been declining for the past few decades. This lack of support is best indicated by the secular decline in share of state budgets devoted to higher education, dropping from above 12 percent in 1987 to under 10 percent in 1995 (Hovey, 1999). This trend is expected to continue through 2010 (Rockefeller Institute of Government, 2000). Policymakers and the public also criticize public universities for the continued rise in tuition above the inflation rate, which reduces access to higher education for low-income and diverse populations. At the same time, they view universities as wasteful of taxpayers' money through excessive duplication and overlap of expensive degree programs and bloated central administration. Many policymakers believe faculties do not use their expertise to solve practical economic and social problems (McGuinness, 1999).

Many policymakers see a statewide governing board as one means to regulate and hold universities accountable to statewide priorities. Such a governance structure is viewed as providing greater control over institutional missions, policies, and budgets and an opportunity for review and assessment of performance (McGuinness, 1997). It also addresses the frustration by many policymakers with the intense lobbying by individual institutions. In economic downturns, therefore, some state officials have proposed to centralize governance in response to high university costs

and declining state revenues (McGuinness, 1999). Some universities might also favor a statewide board structure as a buffer against intrusion by politicians and interest groups into the higher education system (McGuinness, 1997) and as a statewide structure to limit competition (Richardson et al., 1998).

It is not surprising, then, that over the past two decades state governments have focused on centralizing statewide governing boards for higher education. Between 1985 and 1994, 33 states conducted special studies on higher education that examined possible changes in governance structures. Since 1985, 22 states have carried out structural changes, most resulting in greater centralization of governance. Most of these reforms consolidated separate governing boards into a statewide coordinating board or increased the regulatory and financial powers of an existing statewide coordinating board. As a consequence, 75 percent of students in American public higher education attend colleges and universities that are part of a multicampus or consolidated governance system under a single board (McGuinness, 1999).

Declining public support combined with increased statewide oversight and regulation has caused some public universities to favor greater autonomy to compete for students and resources and to function more like private institutions. Other universities are concerned about the effect of autonomy on access to students of different incomes, the goal of serving a diverse population, and a broader public mission.

Is there empirical evidence that governance structures actually make a difference for higher education? The governance structure is only one part of a much broader policy and political process that determines state budgets and policy priorities. Nonetheless, some studies do see an effect of governance on higher education.

Studies have shown a relationship between board structures and tuition and costs. Evidence suggests that decentralized governing systems with no statewide coordinating board have higher tuition costs and a higher portion of tuition paid for by students and parents (Bowen et al., 1997). Public universities in states with substantial private enrollment tend to charge higher tuition than do states with little to offer in the private sector (Quigley and Rubinfeld, 1993). Centrally governed universities rely less on tuition than on state appropriations; and the more universities per board, the less the reliance on tuition. Lowry (2001) finds that the governance structure's degree of centralization and the external election of members of the board of trustees reduce tuition.

Governance also affects other features of universities. The more centralized the board structure, the more students per teacher and the more tenured versus untenured faculty (Toma, 1990). Payne and Roberts (2002) study how state governance affects the relationship between research funding and research activities. Wilson (2002) looks at the governance structure's effect on how universities cater to students who are mobile across academic units within a university.

The relationship between governance structure and institutional quality remains uncertain. Volkwein and Malik (1997) find no relationship between the degree of academic and financial autonomy and the quality of the institution. They find instead that quality is related to the size and wealth of the state and of the institution (see also Volkwein, 1986, 1989). In contrast, Eykamp (1995, p. 206) finds that "this regression indicated that constitutional autonomy provided a four and a half point increase in the quality of the campus compared to non-autonomous campuses. This was almost a one half of a standard deviation of quality as measured across all research universities." He especially notes that financial autonomy is the most important predictor of quality. In addition, institutional quality can be predicted by constitutional autonomy, speed of appointments made to the board by the governor, and campus size.

The following analysis addresses some of the limitations of earlier studies of higher education governance systems. Most studies of higher education governance are descriptive of different governance arrangements but they do not use quantitative data to examine the effects of governance on the performance or management of the higher education system. They also tend not to provide a theoretical explanation for the potential effects of different governance structures.

THEORETICAL FRAMEWORK AND HYPOTHESES

The structure and regulatory powers of state governance systems of higher education vary from one state to the next. We argue that this variation affects the constraints and opportunities university managers have for allocating resources between research and education and for developing alternative sources of revenue.

Elected political leaders hold different preferences about an agency's governance structure and management (Moe, 1990). Chief executives, such as the governor and the President, generally are concerned with the broad constituency of the state or nation and prefer an integrated governance structure. They want to be able to coordinate across functions to satisfy a broad constituency. Chief executives usually favor comprehensive, top-down structures and appointment of the top managers allowing the chief executives to hold the public managers accountable (Kaufman, 1960). In higher education, governors are expected to favor gubernatorial appointments for board members and a comprehensive statewide board structure.

Individual legislators and legislative committees, in contrast, generally depend on narrow constituencies of special interest groups and geographic districts. They prefer a more fragmented management structure that gives them control of the pieces of the public agency that help them with their specialized constituencies. Often they prefer to insulate the agency from the political power of the chief executive by creating independent commissions or governing boards that are not directly part of the broader state or federal administration (Knott and Miller, 1987). In the case of higher education, legislators and special interest groups are expected to support separate boards for community colleges, public and private universities, and research universities versus regional teaching institutions. They are also expected to favor statewide coordinating boards with weak regulatory powers and appointment or election of members by the electorate or by interest associations.

Experts and professionals prefer the greatest degree of decentralization, often arguing that they should have autonomy from state control. The most notorious examples of this kind of governance structure are state medical and legal societies, which have succeeded in obtaining self-regulation in semi-independence from the state. In higher education, professionals are expected to support constitutionally independent universities and single-campus boards with no statewide structure or regulatory powers. They prefer to see some of the board members appointed internally to academic institutions.

The hypothesized consequence of these different constituency preferences is a set of governance structures that reflect the political struggles among the chief executive, legislature, interest groups, and professional groups over control of higher education (Kaufman, 1960). The higher education governance structure of each state, therefore, is hypothesized to respond to some degree to the groups that hold more power in the political process and the kinds of compromises that were made to achieve a governing coalition. Through this broader political process, political actors shape the governance of higher education.

Our study concentrates on whether these differing governance structures make a difference for the constraints and opportunities for managers of universities to allocate resources, decide on tuition rates, and seek other sources of funds. Given that we argue that different constituencies support the different governance structures, the following hypotheses capture the notion that the structures will reflect the values and interests of these constituencies:

- H1. Centralized board structures with strong regulatory powers will reflect the statewide priorities of the state government, including low tuition, broad access, and undergraduate education. We expect to find a similar result for boards that are appointed by the governor.
- H2. On the other extreme, we hypothesize that decentralized structures will encourage university managers to emphasize the academic values of research, publication, and external grants more than undergraduate education and low tuition.
- H3. Hybrid or federal structures will reflect more of a compromise position with more emphasis on tuition and undergraduate education than the decentralized structure and more emphasis on research and grants than the centralized structure.

We hypothesize that governance structures affect tuition and state appropriations because these are the variables that state policymakers have direct control over. Other variables—such as endowment income, grants, and publications—are indirect performance outcomes. We hypothesize that the resource constraints and decisions on tuition imposed by the state governance process create incentives for university administrators to support more or less research and scholarship, including decisions about competitive salaries of faculty and a research versus teaching infrastructure.

METHODOLOGY AND MEASUREMENT

The data set consists of time-series, cross-sectional data that span the period from 1987 to 1998 for comprehensive and Ph.D.-granting public universities.¹ Following Waller (2000) and Lowry (2001), we utilize the classification scheme of higher education governance systems from the *State Postsecondary Education Structures Handbook* (1991, 1994, 1997). *The Structures Handbook* makes a distinction between consolidated governing boards, coordinating boards, and planning agencies as follows:

- *Consolidated governing boards*, which represent the most centralized governance structure, have the authority to govern institutions, establish salaries for chief executives, set faculty personnel policies, develop and implement policies, and allocate resources among the institutions under their jurisdiction.
- *Coordinating boards* do not govern institutions and usually do not have independent corporate status. Coordinating boards have either regulatory or advisory authority over academic programs and budgets. Some coordinating boards have regulatory authority over both academic programs and budgets, while other boards have regulatory authority over only one of these areas and

¹ The universities are classified under the Carnegie (1994) classification scheme. Excluded from the analysis are those universities whose highest degree offered is a bachelor's degree and those universities that are considered a specialty school (such as one that focuses entirely on engineering), as well as those institutions that offer only a two-year degree. We exclude these schools primarily because the data available for them are not as extensive as the data for the universities that are studied.

advisory authority over the other area. A few coordinating boards have only advisory authority over both areas.

- *State planning agencies*, which represent the least centralized structure, typically do not have regulatory or governance authority over the higher education institutions in their states.

In many states, governance boards operate at two levels. The first level is a statewide board that usually has oversight for all four-year public postsecondary institutions.² Although typically there is only one state-level board, a few states have more than one such board. In this case, one of the boards has more regulatory responsibilities than the other boards. The second type of governance structure is at the institutional level. In general, if a university has a state-level board that is classified as a consolidated governing board, there is no institutional-level governance structure. For the other classifications, institutional-level structures vary most dramatically with respect to the number of institutions governed. In some states, each institution has its own board. In other states, one board oversees several (but not necessarily all) of the public institutions in the state.

The methods used to select the members serving on the board can influence the role played by higher education boards in the governance of the university. The most popular method is for the state governor to appoint members. Members may also be appointed by the legislature, elected by the public, or selected internally from the university administration and student body. Lowry (2001) and Knott and Payne (2001) explore these appointment issues. In general, however, Knott and Payne (2001) did not find a significant effect of the methods used to select members of the board and have concentrated the analysis here on the regulatory structure of the governance boards.

In the analysis reported here, several measures of statewide and institutional board structures are employed. First, we identified whether the state-level board has a high, medium, or low level of regulation. State-consolidated governing boards always have regulatory authority over both program approval and budget, while state coordinating boards may or may not have this kind of regulatory authority. Planning agencies have no regulatory authority. To qualify as having a high level of regulation, the state-level board must be either a consolidated governing board or a coordinating board that has regulatory authority over both the budget and program approval. To qualify as having a medium level of regulation, the state-level board must be a coordinating board that has regulatory authority over the budget or program approval but not both. To qualify as having a low level of regulation, the state-level board must be a coordinating board with no regulatory authority or must be a planning agency. In the regression analysis, we omit the measure for a state-level board with a low level of regulation.

Second, we segregated the states and universities based on whether they have an institutional-level board and whether the board covers multiple campuses. In the regression analysis, we omit the measure of universities with an institutional-level board that covers only a single campus. Third, some states changed the structure of the state-level governance board over the sample period. For these states we measure changes that resulted in a more regulated or a less regulated structure.

Table 1 reports the distribution of states based on state-level governance structures as they existed in 1990. The bold print identifies those states that enacted a change in governance structure that affected the degree of state-level regulation. In 1990, 29

² In some instances the board also has oversight authority for two-year institutions. In other instances there is a separate board with oversight authority for two-year institutions. In some states, the state-level board also has some authority over private institutions.

Table 1. State governance structure.

State	# Universities	# Research	Changes Since 1990	By Year	Direction of Change
Highly Regulated—Governing Board or Coordinating Board with Strong Regulation Powers					
Alabama	15	4			
Arizona	3	3			
Arkansas	7	1			
Connecticut	5	1			
Florida	9	6			
Georgia	15	3			
Idaho	3	2			
Illinois	12	5	9 institutional boards	1997	
Iowa	3	2			
Kansas	7	3			
Maine	2	1			
Maryland	9	2			
Massachusetts	10	2	Moderately regulated	1990	Less regulation
			Highly regulated	1997	More regulation
Mississippi	6	3			
Montana	5	2			
Nevada	2	1			
New Hampshire	3	1			
New Jersey	10	3	Moderately regulated	1997	Less regulation
North Carolina	12	3			
North Dakota	3	2			
Ohio	11	10			
Oklahoma	8	2			
Oregon	5	3			
Rhode Island	2	1			
South Carolina	8	2			
South Dakota	3	1			
Utah	4	2			
Wisconsin	31	2			
Wyoming	1	1	1 institutional board	1997	
Moderately Regulated—Coordinating Board, Some Regulated					
Colorado	7	5	Highly regulated	1997	More regulation
Indiana	12	5	Highly regulated	1997	More regulation
Kentucky	8	2	Highly regulated	1997	More regulation
Louisiana	13	4	Highly regulated	1997	More regulation
Missouri	10	4	Highly regulated	1997	More regulation
New York	25	7			
Pennsylvania	19	4	Minimally regulated	1994	Less regulation
Tennessee	9	4	Highly regulated	1997	More regulation
Texas	31	10			
Virginia	12	6			
Washington	5	2			
Minimally Regulated—Coordinating Board, Advisory or Planning Agency					
California	29	10			
Delaware	2	1			
Michigan	15	5			
Minnesota	8	1	Highly regulated	1997	More regulation
Nebraska	5	1	Moderately regulated	1994	More regulation
New Mexico	4	1			
Vermont	3	1	Highly regulated	1994	More regulation
West Virginia	2	1	Highly regulated	1994	More regulation

states had a board that possessed a high degree of regulatory power. Only two of these states, Massachusetts and New Jersey, changed their structure during the sample period. In 1990, 11 states had a board that possessed a medium degree of regulatory power. Six of these states changed to a more highly regulated structure by 1997. Eight states in 1990 had a board that possessed a low degree of regulatory power. Four of these states changed to a more regulated board structure during the sample period.

We focus on two sets of dependent variables. The first set concerns university revenues under the direct influence of the state government and the board: tuition revenue, state appropriations, and in-state and out-of-state tuition rates. The second set concerns indirect measures of performance outcomes: market value of the university endowment, total research funding, publications, and citations per publication.³ We also look at the relationship between structure and total current revenue. We begin the analysis by exploring basic summary statistics for the relationships between governance structure and the dependent variables. Second, we examine the differences across universities in more detail by utilizing a regression technique that allows us to control for political, economic, and regional influences.

RESULTS

Comparison of Universities Based on State-Level Governance Structure

For our first level of analysis, we focus on resources and research activities based on the type of state governance structure under which universities operate. Table 2

Table 2. Summary statistics.

Resource or Productivity Measure—All Schools

	All	High Regulation	Medium Regulation	Low Regulation
Total revenue (millions)	147.942	136.840	127.659	221.455
(standard deviation)	(227.488)	(194.902)	(182.095)	(349.878)
Tuition revenue (millions)	27.122	25.007	25.574	36.162
(standard deviation)	(34.146)	(25.559)	(30.567)	(48.557)
State appropriations (millions)	54.056	52.480	46.386	75.025
(standard deviation)	(62.794)	(62.220)	(51.696)	(79.621)
In-state tuition rate (1000s)	1.067	2.132	2.110	2.365
(standard deviation)	(2.164)	(0.971)	(1.041)	(1.324)
Out-of-state tuition rate (1000s)	5.799	5.554	2.456	7.035
(standard deviation)	(2.684)	(2.543)	(5.522)	(3.121)
Endowment (millions)	32.746	18.576	44.498	48.884
(standard deviation)	(180.252)	(51.319)	(269.437)	(132.907)
Total research funding (millions)	38.195	37.022	28.473	60.708
(standard deviation)	(72.135)	(63.664)	(60.962)	(103.136)
Articles published	994.731	798.534	945.116	1,770.232
(standard deviation)	(1061.816)	(853.848)	(946.209)	(1499.745)
Citations per article published	10.923	9.438	11.568	14.642
(standard deviation)	(6.979)	(5.652)	(7.335)	(8.570)

³ Our data come from several sources. Most of the measures come from the National Science Foundation's CASPAR data set. The CASPAR data set represents a central depository for measures on universities that have been collected by several federal agencies. Measures on academic publications are from the Institute for Scientific Information. For those measures that are reported in dollars, we have normalized the data to reflect 1996 price indices

reports summary statistics for total revenue, tuition revenue, state appropriations, in- and out-of-state undergraduate tuition rates, endowment, total research funding, number of academic publications, and the citations per article across the universities during the sample period for the three types of state governance measures. Across all of the measures, the institutions in states with a low level of regulation have the highest values. The institutions in states with a high level of regulation have the lowest values for most of the measures. The institutions in states with a medium level of regulation have an average value that reflects the averages for the institutions in the highly regulated states for all of the measures except the endowment values. Although the average values differ strikingly between the high- and low-regulated states, the variance in the measures within each category of regulation is quite high, which is due in part to the differences between research and comprehensive universities.

Simple summary statistics may not truly reflect potential differences associated with the level of state regulatory power. To minimize the differences in the institutions based on size and mission, Table 3 reports the summary statistics for only the flagship institution of each state in the study. A flagship institution historically has been considered the premier institution within a state. It has been in existence for many decades and tends to be viewed as the institution that receives the most political favors. Similar to the statistics in Table 2, flagship universities in low-regulatory states consistently have greater resources and greater research productivity than their counterpart universities in the high-regulatory states.

Comprehensive Differences in State and Local Governing Structures

Although the analysis in the previous section illustrates differences among universities based on the state-level governance structure, a more extensive analysis is needed for several reasons. First, we do not control for whether the universities

Table 3. Summary statistics, flagship universities.

Resource or Productivity Measure	All	High Regulation	Medium Regulation	Low Regulation
Total revenue (millions)	468.791	384.609	518.678	751.152
(standard deviation)	(372.402)	(318.761)	(254.558)	(572.806)
Tuition revenue (millions)	73.577	59.657	87.179	110.481
(standard deviation)	(57.918)	(46.563)	(45.085)	(92.864)
State appropriations (millions)	142.129	130.698	143.887	189.282
(standard deviation)	(92.462)	(97.129)	(55.404)	(110.066)
In-state tuition rate (1000s)	2.533	2.417	2.605	2.983
(standard deviation)	(1.299)	(1.241)	(1.214)	(1.608)
Out-of-state tuition rate (1000s)	7.119	6.803	7.187	8.578
(standard deviation)	(3.382)	(3.204)	(3.083)	(4.308)
Endowment (millions)	160.599	89.009	401.534	197.166
(standard deviation)	(455.111)	(60.430)	(856.358)	(256.371)
Total research funding (millions)	118.752	98.376	136.483	190.725
(standard deviation)	(103.847)	(91.744)	(87.760)	(142.036)
Articles published	1,590.200	1,072.709	1,998.000	2,413.500
(standard deviation)	(1190.382)	(1280.003)	(909.752)	(1548.968)
Citations per article published	12.805	11.459	14.968	15.668
(standard deviation)	(6.626)	(6.175)	(6.648)	(6.919)

have a board that covers multiple campuses. For example, in California, a state-level coordinating board has only advisory powers over the University of California, California state universities, and community colleges. Separate boards oversee each of the three types of institutions, which possess, to some extent, more authority over the operation of the public universities in California than the statewide board. Thus, it is important to control for the effect of both a decentralized state-level board and a multicampus structure. Second, we do not control for differences at the regional or university level that may affect the operations of the universities. If some universities have a longstanding reputation within the state or the nation, these universities might be expected to have more resources than recently established universities.

To explore these relationships in more detail, a regression analysis was employed that measures the state- and institutional-level factors that could affect the impact of governance structures on universities. Several characteristics of the university are controlled for, including dummy variables equal to 1 if the university has a medical school and if the university is classified as a research or doctoral university. Control measures were also included for the undergraduate enrollment and size of faculty at the institution. To control for the conditions of the state in which the university is located, state-level political, economic, and demographic measures were included.⁴ To control for macrolevel changes that affect all universities similarly, a year trend effect was included.⁵ In addition, the specification includes regional fixed effects, which are designed to capture non-time varying measures of regional differences among the universities. For example, public universities in the Northeast might be expected to operate differently from those in the Midwest or the West because they have different types of students, industries, and levels of competition from private universities. For this time-series cross-section data set, clustered standard errors, clustering on the individual institutions, were used. This method of standard errors helps to control for the multiple observations of a single institution.

Table 4 reports the results when total revenue is used as the dependent variable, which reflects potential substitution and complementary effects between various resources. Column 1 shows the results for all institutions, indicating that, after controlling for state- and institutional-level characteristics, there is no difference among the institutions based on the governance structure. The only governance measure that is statistically significant at a p -value of less than 0.05 is a change in state regulatory behavior toward more regulation. The average level of total revenue is \$41 million less at institutions in states that switch to a more regulated structure. This decline in revenue represents a significant change relative to the average total revenue across all institutions of \$148 million.

Also reported are the coefficients for the political measures used in the analysis. Interestingly, total revenues on average are lower in states with a Democratic governor (by \$13 million) and in states with a high degree of competition between the two key political parties in the upper and lower chambers of the legislature (by \$203 million).

⁴ These measures reflect the political affiliation of the governor and the state legislature, the real per capita income in the state, the unemployment rate, the state population, and the percentage of the population that is poor, old, or young.

⁵ In employing a reduced-form analysis, there are likely to be other measures that are not included in the analysis that may affect the resources and other measures of university activity. We believe, however, these omitted variables are not correlated with the measures concerning the role of state governance structures.

Table 4. Regression results for total revenue.

Dependent Variable: Total Revenue (millions)	All Schools (1)	Flagship Only (2)
Highly regulated board	-29.49 (24.02)	-291.98 (123.90)
Moderately regulated board	-30.51 (22.03)	-236.91 (114.36)
Change in board—more regulation	-40.96 (20.11)	-1.13 (66.10)
Change in board—less regulation	-15.58 (19.61)	-81.03 (115.65)
Multicampus institutional board	5.97 (10.42)	-179.11 (46.94)
F-statistic on governance measures	1.51 (0.19)	3.56 (0.01)
Doctorate-granting university	8.92 (17.84)	
Medical school	212.29 (33.12)	119.34 (44.27)
Undergraduate enrollment (/1000)	-5.12 (4.23)	-0.21 (7.96)
# of faculty (/100)	42.94 (8.90)	40.06 (14.28)
Coefficients on political measures		
democratic governor	-12.52 (6.16)	-92.82 (33.98)
% Democrats in state upper legislature	51.59 (30.53)	176.41 (133.88)
% Democrats in state lower legislature	-19.97 (27.20)	-50.43 (105.44)
Competition in state legislature	-202.66 (113.93)	-444.90 (532.38)
F-statistic on political measures	3.58 (0.01)	3.07 (0.03)
Year trend	13.07 (1.43)	39.54 (5.95)
Fixed effects	Regional	Regional
State level measures	Yes	Yes
R-squared	0.7442	0.8012
# of observations	4110	465

Note: Clustered (at school level) standard errors reported in parentheses except for F-statistics; coefficients in bold are significant at a p -value < 0.05 ; coefficients in bold and italicized are significant at a p -value < 0.10 . Additional regressors include the following state-level economic and demographic measures: real per capita income, unemployment rate, state population, percentage of population under 18, percentage of population over 65, percentage of population in poverty, and percentage of population that are black.

Column 2 gives the results when only the flagship institutions are analyzed. For these institutions, governance structures appear to matter significantly. For both high-regulatory and medium-regulatory states, total revenue is approximately \$234 million to \$292 million lower than in the low-regulatory states. Thus, although it appears that across all institutions, the average effect of regulation is minimal for total revenue, the flagship institutions may pay a price based on the level of state regulation of the institution.

Next to be examined were the dependent variables under the direct control of the state government and the governing board, namely tuition and state appropriations. Table 5 reports the results for tuition revenue, state appropriations, in-state tuition rates, and out-of-state tuition rates. For all institutions, including flagship institutions, tuition revenues are lower in those states with a board that has high regulatory powers. Overall, the average level of tuition revenue across all institutions is \$27 million. In states with high regulation, tuition revenue is \$9 million lower, or a third of the average. Similarly, the average level of tuition revenue for the flagship institutions is \$74 million. In states with high regulation, tuition revenue is \$38 million lower, which is more than 50 percent of the average. Columns 6 through 9 report the results for the in-state and out-of-state tuition rates. Across all specifications, including for the flagship institutions, average tuition rates are lower (between 12 and 40 percent lower) at institutions in high-regulation states. These results are consistent with the anecdotal evidence that more regulation usually results in lower tuition rates.

The results are more surprising for state appropriations. One might expect that the highly regulated states favor lower tuition to increase access, but these states make up the difference in lost tuition revenue for universities by higher state appropriations. The regression results, however, do not support this argument. For all institutions there is relatively little difference in state appropriations between the high- and low-regulated states after controlling for institutional- and state-level characteristics. In high-regulatory states, appropriations for flagship institutions are \$29 million lower on average (20 percent across all flagship institutions) than the state appropriations for the flagship institutions in states with a low level of regulation. Moreover, state appropriations, \$51 million, are at a dramatically lower level at the flagship institutions in a state with a medium level of regulation. Thus, the results suggest that state governments do not use state appropriations to subsidize institutions that have lower tuition rates.

Interestingly, the political measures play an important role in the regressions for all of the measures reported in Table 5 except for state appropriations. Tuition revenues are lower in states with a Democratic governor and in states with a high degree of competition between the political parties in the legislature. State appropriations, however, do not benefit from the political composition of the legislature or from the political party of the governor's office.

Finally, Table 6, illustrates the relationship between governance structures and other types of resources and activities undertaken by the institutions. These measures are examined primarily to ascertain whether governance structures play a role in creating incentives to perform in one way or another. Governance choices on tuition and state appropriations may influence university administrators' decisions about fund-raising, research, teaching, and faculty salaries. Table 6 shows only flagship institutions.

Column 1 gives the results for the market level of the institutions' endowment. After controlling for institutional- and state-level characteristics, the results suggest little difference in endowment based on regulatory structure. The one governance

Table 5. Regression results for tuition and state appropriations

Dependent Variable	Tuition Revenue (millions) All (1) Flagship (2)	State Appropriations (millions) All (3) Flagship (4)	In-State Tuition (1000s) All (5) Flagship (6)	Out-of-State Tuition (1000s) All (7) Flagship (8)	
Highly regulated board	-8.63 (4.02)	0.29 (4.34)	-0.43 (0.08)	-0.71 (0.23)	-1.97 (0.72)
Moderately regulated board	-4.26 (3.46)	-7.18 (4.01)	-0.20 (0.07)	-0.16 (0.21)	-1.18 (0.69)
Change in board—more regulation	1.07 (5.64)	-0.57 (7.24)	0.11 (0.14)	-0.16 (0.31)	1.00 (0.96)
Change in board—less regulation	1.21 (4.57)	20.46 (10.98)	0.39 (0.10)	0.45 (0.26)	-0.04 (0.45)
Multicampus institutional board	1.21 (1.71)	0.55 (9.25)	-1.77 (2.35)	0.21 (0.14)	0.24 (0.49)
F-statistic on governance measures	2.22 (0.05)	4.09 (0.00)	18.33 (0.00)	7.73 (0.00)	3.25 (0.01)
Doctorate-granting university	4.60 (2.47)	4.15 (2.85)	0.54 (0.07)	1.22 (0.17)	1.31 (0.39)
Medical school	14.82 (3.59)	24.76 (6.87)	0.20 (0.09)	0.44 (0.22)	1.31 (0.39)
Undergraduate enrollment (/1000)	0.72 (0.61)	-0.40 (0.66)	-0.02 (0.01)	-0.01 (0.02)	-0.04 (0.05)
# of faculty (/100)	4.54 (1.48)	3.01 (2.20)	0.02 (0.02)	0.14 (0.05)	0.05 (0.09)
Coefficients on political measures	-2.43 (0.94)	-0.44 (1.45)	-0.17 (0.04)	-0.06 (0.13)	-0.07 (0.30)
Democratic governor	-0.20 (4.50)	9.67 (6.30)	0.10 (0.14)	0.10 (0.33)	-0.25 (1.08)
% Democrats in state Upper legislature	-18.28 (5.75)	5.70 (7.27)	-0.44 (0.18)	-0.32 (0.43)	-1.38 (1.00)
% Democrats in state Lower legislature	-97.77 (22.42)	6.49 (22.65)	-2.67 (0.67)	-1.41 (1.70)	-7.33 (4.07)
Competition in state legislature	7.44 (0.00)	1.49 (0.21)	9.75 (0.00)	3.16 (0.01)	1.03 (0.40)
F-statistic on political measures	3.29 (0.24)	9.11 (0.97)	0.20 (0.01)	0.24 (0.02)	0.74 (0.05)
Year trend	Regional	Regional	Regional	Regional	Regional
Fixed effects	Yes	Yes	Yes	Yes	Yes
State-level measures	0.7492	0.8566	0.7660	0.7872	0.8184
R-squared	4110	4084	4521	4518	515
# of observations	465	463	514	514	515

Note: See notes to Table 4.

Table 6. Regression results for non-state related measures.

Dependent Variable	Endowment— Market Value (millions)	Total Research Funding (millions)	Publications	Cite/ Publication
	Flagship Only (1)	Flagship Only (2)	Flagship Only (3)	Flagship Only (4)
Highly regulated board	-164.69 (107.04)	-73.20 (19.77)	-773.68 (204.81)	-1.32 (1.24)
Moderately regulated board	-112.69 (74.85)	-63.79 (19.16)	-357.47 (200.06)	0.19 (1.05)
Change in board—more regulation	180.89 (101.22)	18.74 (12.32)	320.19 (130.06)	-0.79 (0.77)
Change in board—less regulation	-173.80 (174.22)	-14.19 (20.77)	-38.98 (159.03)	1.59 (1.99)
Multicampus institutional board	-103.49 (71.99)	-55.84 (16.31)	-613.34 (200.45)	-1.10 (0.97)
F-statistic on governance measures	0.88 (0.50)	3.78 (0.01)	4.15 (0.00)	2.59 (0.04)
Medical school	-87.99 (88.77)	19.53 (9.77)	280.45 (107.79)	2.68 (0.75)
Undergraduate enrollment (/1000)	1.28 (6.09)	1.08 (1.73)	20.37 (14.36)	-0.04 (0.07)
# of faculty (/100)	4.87 (17.93)	10.43 (3.50)	117.48 (26.83)	0.23 (0.13)
Coefficients on political measures				
Democratic governor	-106.21 (44.73)	-12.65 (8.86)	-155.51 (88.42)	-0.72 (0.50)
% Democrats in state upper legislature	198.42 (182.31)	65.19 (33.28)	713.12 (322.16)	2.58 (2.99)
% Democrats in state lower legislature	-312.78 (220.60)	-59.85 (28.87)	-520.61 (313.00)	1.28 (3.55)
Competition in state legislature	559.89 (769.37)	-121.79 (132.34)	-1042.39 (1431.67)	2.20 (7.07)
F-statistic on political measures	2.18 (0.09)	1.95 (0.12)	2.29 (0.07)	1.13 (0.36)
Year trend	22.73 (9.79)	9.56 (1.54)	36.72 (12.73)	-0.88 (0.09)
Fixed effects	Regional	Regional	Regional	Regional
State-level measures	Yes	Yes	Yes	Yes
R2	0.7118	0.8219	0.8808	0.7759
# of observations	387	501	517	517

Notes: See notes to Table 4.

measure that is statistically significant at p -value of < 0.10 is a change in governance structure toward more regulatory power. This positive coefficient suggests that institutions with greater regulation have higher endowments than the other institutions.

Column 2 reports the results for total research funding. Flagship institutions in a state with a high level of regulatory authority obtain fewer research dollars. On

average there is a difference of \$73 million dollars, or more than 60 percent, between the high- and low-regulated states. Column 3 gives the number of articles published. Once again, on average there are fewer publications at flagship institutions in high-regulated states, compared with the low-regulated states. The difference is approximately 774 publications, or 49 percent of the average for all flagship institutions. Column 4 gives the number of citations per article published; no evidence suggests that this measure varies based on the regulatory structure under which the institution operates.

The regression results support the notion that resources are more abundant at universities in states with a more decentralized state-governance structure. Governance structures have a significant effect on flagship universities, and the impact of changing the regulatory powers of a board affects some but not all resources. In addition, there is a limited impact of having a multicampus structure on the distribution of resources across universities.

The institutions in states with a medium level of regulatory oversight lie in between those with high and low levels of regulatory oversight. This is particularly true with respect to the direct measures of tuition revenue and state appropriations. Overall the coefficients for the medium-governance measure are negative, but they are less precisely measured and often lower than the coefficients for the high-governance measure. The one exception is state appropriations for the flagship institutions. For this specification, institutions with a medium level of regulation receive on average the lowest amount of state appropriations.

In conjunction with the hypotheses laid out above, the institutions in states with a moderate regulation receive less in research funding and have fewer publications than those institutions in states with low regulation. These institutions also receive more in research funding and have more publications than the institutions with a highly regulated board. In both specifications, however, the coefficients for the moderately regulated institutions are less precisely measured than the coefficients for the highly regulated institutions. As such, the coefficients for the highly and moderately regulated measures are not statistically different from each other when total research funding is the dependent variable.

SUMMARY

The strengths and weaknesses of different higher education governance structures are mediated by historical and geographical factors. States and regions of the country have different political cultures and economic conditions. These differences can play a more important role in determining the features of university performance than governance structures. In the East, for example, public universities face stiff competition from a well-developed private system of higher education. In the West, public education dominates the higher education landscape. Performance features of universities also depend on whether the university has a medical school. Advantages of a medical school include political support, high salaries, alumni gifts, practice income, and large federal grants.

The literature on higher education governance also argues that the personalities and quality of the board leadership play an important role in mediating the influence of governance systems on performance. Some centralized systems show little ability to plan and coordinate the allocation of resources, while other decentralized systems accomplish these statewide goals well. Similarly, the relationships that the board develops with the state legislature and the governor depend on the historical peculiarities of individual states and the people involved.

The analysis reported here is compatible with the political economy literature insofar as it demonstrates that governance structures do matter. The structure of state and substate boards influence several important managerial choices of resource allocation and sources of revenue. The structure may also have an indirect effect on how university administrators make decisions about supporting research and other activities. Of particular importance is the centralized or decentralized structure of the boards, which tend to reflect different political actors and hence different political constituencies. The degree of centralization plays a role in how well a system responds to statewide political priorities, which often favor lower tuition and a greater focus on students rather than on research and faculty support. Decentralized systems, which represent more the professional and institutional interests of universities, tend to push the behavior of public university senior administrators toward a private university model that relies more on tuition revenue and research dollars rather than state appropriations. These effects are stronger for flagship research universities. The regression results show that the distribution of resources across flagship universities differ based on governance structures, after controlling for institutional and state-level characteristics.

Universities are facing difficult choices as state appropriations continue to erode in times of large state budget deficits. Some universities are responding to this deteriorating financial situation with proposals for large tuition increases and pleas for greater autonomy from state control. In this analysis, tuition increases were positively correlated with state appropriations in decentralized governance systems. Greater autonomy, however, may sever this positive relationship, pushing flagship universities in these states in particular toward becoming semiprivate institutions with high tuition and research funding. Flagship universities in states with a medium or high level of centralized governance, however, may be unable politically to raise tuition. Such a scenario threatens the continued quality in research and fund-raising of the flagship universities in these states more than the other institutions.

While governance is a factor in determining resources and other activities, it is important to note that it is only one component of the states' regulatory and budget structure. It also is not the only factor that varies in importance from one setting to another. Developing causal models and regional quantitative studies should help us better understand these relationships in the future.

This research is supported by a grant from the Andrew W. Mellon Foundation and the Social Science and Humanities Research Council. We are extremely grateful for the diligent work of our research assistants Rebecca Hanson and John VerKuilen.

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REFERENCES

- Bowen, F. M., Bracco, K. R., Callan, P. M., Finney, J. E., Richardson, R. C., Jr., & Trombley, W. (1997). State structures for the governance of higher education: A comparative study. The California Higher Education Policy Center.

- Carnegie Foundation (1994). *Classification of the higher educational institutions*. Washington, DC: Carnegie.
- Eykamp, P. W. (1995). *Political control of state research universities: The effect of the structure of political control on university quality and budget*. Unpublished Ph.D. dissertation AAT 9544136, University of California-San Diego. Available at: <<http://www.lib.umi.com/dissertations>>.
- Heinrich, C. J., & Lynn, L. E. (Eds.) (2002). *Governance and performance: New perspectives*. Washington, DC: Georgetown University Press.
- Horn, M. J., & Shepsle, K. (1989). Commentary on "Administrative arrangements and the political control of agencies." *Virginia Law Review*, 75, 499–508.
- Hovey, H. A. (1999). *State spending for higher education in the next decade: The battle to sustain current support*. San Jose, CA: The National Center for Public Policy and Higher Education.
- Kaufman, H. (1960). Emerging conflicts in the doctrines of public administration. *American Political Science Review*, 50(4), 1057–1073.
- Knott, J. H., & Miller, G. J. (1987). *Reforming bureaucracy: The politics of institutional choice*. Englewood Cliffs, NJ: Prentice Hall.
- Knott J. H., & Payne, A. A. (2001). *The impact of state governance structures on higher education resources and research activity*. Working Paper #93, Institute of Government and Public Affairs, University of Illinois, Urbana-Champaign, Illinois
- Lowry, R. C. (2001). Governmental structure trustee selection, and public university prices and spending: Multiple means to similar ends. *American Journal of Political Science*, 45, 845–861.
- McCubbins, M., Noll, R., & Weingast, B. (1987). Administrative procedures as instruments of political control. *Journal of Law, Economics and Organization*, 2, 243–277.
- McCubbins, M., Noll, R., & Weingast, B. (1989). Structure and process, politics and policy: Administrative arrangements and the political control of agencies. *Virginia Law Review*, 75, 431–483.
- McGuinness, A. C., Jr. (1997). The changing structure of state higher education leadership. In E. Holmes (Ed.), *Public policy and higher education* (pp. 125–159). Boston: Pearson.
- McGuinness, A. C., Jr. (1999). The states and higher education. In P. Altbach (Ed.), *American higher education in the twenty-first century: Social, political, and economic challenges* (pp. 191). Baltimore: Johns Hopkins University Press.
- Moe, T. M. (1989). The politics of bureaucratic structure. In J. Chubb & P. Peterson (Eds.), *Can the government govern?* (pp. 267–329). Washington, DC: Brookings Institution.
- Moe, T. M. (1990). The politics of structural choice: Toward a theory of public bureaucracy. In O. Williamson (Ed.), *Organization theory: From Chester Barnard to the present and beyond* (pp. 116–153). Oxford: Oxford University Press.
- Payne, A. A., & Roberts, J. (2002). *Government oversight of organizations engaged in multiple activities: Does centralized governance encourage quantity or quality?* McMaster University. Available at <<http://socserv.socsci.mcmaster.ca/payne>>.
- Quigley, J. M., & Rubinfeld, D. L. (1993). Public choices in public higher education. In C. T. Clotfelter & M. Rothschild (Eds.), *Studies of supply and demand in higher education* (pp. 243–273). Chicago: University of Chicago Press.
- Richardson, R. C., Jr., Bracco, K. R., Callan, P. M., & Finney, J. E. (1998). *Higher education governance: Balancing institutional and market influences*. San Jose, CA: The National Center for Public Policy and Higher Education.
- Rockefeller Institute of Government (2000). *The National Information Center for Higher Education Policymaking and Analysis*. Available at: <www.higheredinfo.org>.

- State Postsecondary Education Structures Sourcebook. (1991, 1994, 1997). Denver: Education Commission of the States.
- Toma, E. F. (1990). Boards of trustees, agency problems, and university output. *Public Choice*, 67, 1–9.
- Volkwein, J. F. (1986). Campus autonomy and its relationship to measures of university quality. *Journal of Higher Education*, 57(5), 510–524.
- Volkwein, J. F. (1989). Changes in quality among public universities. *Journal of Higher Education*, 60(2), 136–151.
- Volkwein, J. F., & Malik, S. M. (1997). State regulation and administrative flexibility at public universities. *Research in Higher Education*, 38(1), 17–42.
- Waller, C. (2000). *Governance and coordination of public higher education in all 50 states*. Raleigh, NC: North Carolina Center for Public Policy Research.