

The Impact of State Governance Structures on Higher Education
Resources and Research Activity

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Jack H. Knott*
University of Illinois

and

A. Abigail Payne**
University of Illinois

Abstract: Universities in the United States reside in regions that have different political cultures and economic conditions. While these facts and the reputation of the university play an important role in determining the features of university performance, the role of state governance of public universities also is an important factor. 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. We explore whether the governance structure affects the resources allocated and the activities undertaken by universities. This paper develops a classification of higher education structures and shows the effects of these structures using a data set that covers the period 1987 to 1997. 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 with members that are not primarily appointed by the governor.

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*Mailing Address: Institute of Government and Public Affairs, University of Illinois, 1007 W. Nevada Street, Urbana, IL 61801; phone: (217)244-4813; email: jhknott@uillinois.edu.

**Mailing address: Institute for Government and Public Affairs, University of Illinois, 815 W. Van Buren Street, Suite 525, Chicago, IL 60607; phone: (312)413-3031; email: apayne@uic.edu

Over the past two decades state governments have given considerable attention to the governance system of higher education. Between 1985 and 1994, thirty-three states conducted special studies on higher education that examined possible changes in governance structures. Since 1985, 22 states have carried out structural changes with most resulting in greater centralization of governance. Most of these reforms consolidated separate governing boards into a statewide coordinating board and/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 multi-campus or consolidated governance system under a single board (*see* McGuinness (1999)). More recently, however, the trend has started to reverse with state governments initiating changes to bring more decentralization into the system.

A variety of motives explain the attention given to governance systems by public policymakers. A consolidated board structure holds universities accountable to statewide priorities through greater control over institutional missions, policies, and budgets and provides an opportunity for review and assessment of performance (*see* McGuinness, (1997)). Specifically, policymakers and the public have voiced concerns about the continued rise in tuition above the inflation rate and decisions by competing institutions to duplicate expensive graduate professional degree programs. Additionally, many policymakers would like to see universities apply expertise to practical needs of economic development and the solution of social problems. According to McGuinness (1999), policymakers centralize governance systems out of frustration with intense lobbying by individual institutions, administrative barriers to students transferring from one institution to another, and university-initiated proposals to close or reduce the size of small and rural campuses.

Some universities might also favor a statewide board structure. These universities may see these boards as a buffer against inappropriate external intrusion by politicians and interest groups into the higher education system (*see, e.g.,* McGuinness (1997)). They also may view them as a way to negotiate and provide a regulatory structure to limit competition and allocate “fair share” resources among the state’s higher education institutions (*see* Richardson et al. (1998)). Finally, depending on how boards are chosen, they can promote higher education in the state and support professional academic values and quality.

Does this widespread attention to governance structure make any difference for the performance of higher education? The purpose of this paper is to attempt to answer this question by examining the strengths and weaknesses of different governance structures. Previous research has been mostly descriptive of different governance arrangements. With a few exceptions, the previous research has not examined the effects of governance on how the higher education system functions. This paper takes a fresh approach and shows the effect of governance structures and regulatory authority over time in performance features of universities, including total revenue, tuition, total costs, state and local appropriations, donations, research funding, publications, and enrollments.

The paper develops a classification of higher education structures and shows the effects of these structures on university resources and research activities. We examine data for universities in the 50 states between 1987 and 1997, using simple statistics as well as a regression analysis that accounts for the heterogeneity across the institutions studied. The analysis shows that, for most of the measures, productivity and resources are higher at universities with a statewide board that is more decentralized. This is particularly true with respect to measures of tuition revenue, endowment, total donations, research funding, and

academic publications. The time-invariant aspects of the universities, such as their reputation and whether they are Ph.D. granting institutions, also determine much of the variation in resources. In addition, the statistical analysis reveals that the effect of statewide governance structure on university resources occurs for the most part only with the Ph.D. granting institutions and not with the institutions whose highest degree granted is at the master's level.

The paper proceeds as follows: section I provides a literature review, section II presents our research framework, section III presents the results, and section IV provides a brief conclusion.

I. Literature Review

Do governance structures make a difference for the resources and performance of universities? McGuinness (1999) suggests that despite the widespread interest and attention to changing governance structure, the evidence remains inconclusive on the costs and benefits of one structure over another. He observes,

“Examples can be found of both more centralized and less centralized systems working well in terms of providing direction for the system....At the same time, one can find examples of both coordinating and consolidated governing boards that are giving insufficient time to policy leadership” (McGuinness (1997)).

McGuinness argues that many state government proposals to change university governance systems have little to do with higher education policy or performance. In economic downturns, some state officials propose governance changes in response to high university costs and declining state revenues. He also points to the variation in political culture among the states, which produces regional and state-by-state differences that overshadow the specific strengths and weaknesses of governance systems.

State governments, however, continue to take actions and show interest in governance structures, and some studies reveal that governance structures have a significant impact on features of the higher education system. Most of these studies are descriptive and tend to focus on the plusses and minuses of different governance systems for statewide planning, policy, and decision making. A few studies do develop empirical models of the affect of governance on university performance. We consider the descriptive studies first because they provide a classification of governance structures and an overview of how governance systems function. We then turn our attention to the empirical studies, on which the analysis of this paper is based.

A. Policy Coordination and Statewide Planning

Waller et al. (2000) summarizes the advantages and disadvantages of different governance systems for statewide planning and coordination based on the degree of centralization. To define centralization she relies on the *State Postsecondary Education Structures Handbook*, which makes a distinction between consolidated governing boards, coordinating boards, and planning agencies:

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.

Waller et al. conclude that the greatest challenge to consolidated governing boards is the tension between broad statewide planning and the special and unique needs of individual institutions. Governing boards that focus only on statewide planning ignore the richness and diversity of the state's education system. Boards that bow to the pressures of individual institutions in budget allocations and personnel decisions risk jeopardizing statewide priorities and needs. Waller et al. agree with McGuinness that centralized boards can function effectively

or ineffectively depending upon the personalities, political relationships, information base, and selection process of the higher education system and state government leadership.

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

Waller et al. argues that with coordinating boards a complement of institutions can effectively address the postsecondary education needs of the state, from local to statewide priorities. Separate coordinating boards for classes of institutions are most advantageous in states with numerous institutions and a large number of students. Coordinating systems also separate the tasks of coordination and governance, thus allowing the broad-based coordinating board to focus on coordination issues and the institutional boards to focus on governance. The disadvantages of state coordinating systems include a potential for inefficiency and the challenge of two separate boards working together. The tendency, such as in California, is for segmented boards to focus too narrowly on their own area or type of institution with no cross-segment coordination.

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.

Only two states, Delaware and Michigan, currently operate a higher education system with state planning agencies and individual institutions' boards but with no other statewide coordinating or governing entities. In Delaware, the small number of higher education institutions might make a statewide coordinating or governing board unnecessary and wasteful.

In Michigan, the long historical tradition of institutional autonomy and educational excellence has made it politically infeasible to establish and operate a centralized coordinating or governing board. Despite the lack of a centralized board, both systems exhibit “fair share” budget and program allocations among the institutions, and individual institutions provide statistics on performance and other activities for statewide comparisons.

B. Higher Education Decision Making

The governance literature argues that different governance systems do affect higher education decision-making. Bowen, et al. (1997) maintains that consolidated systems with a single governing board depend more on individual leadership and changes in leadership than do decentralized systems. He asserts that in these kinds of unified systems tense relations often develop between state government and the board and invite management by strong governors and the legislature unless protected by constitutional autonomy. Because of these tensions and in order to limit the influence of external governmental actors, unified governance systems provide less information on institutions’ performance. In contrast, federal systems with coordinating boards prefer to build consensus among institutions rather than rely on central authority. Coordinating boards tend to strengthen the hand of university presidents in dealing with faculty resistance to change. It should also be noted that placing students and faculty on the board leads to a greater focus on internal issues (*see McGuinness (1999)*).

C. Tuition and Costs

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. Conversely, institutions’ operating costs are less in states with statewide coordinating and

governing boards (Bowen et al., 1997). Centrally governed universities rely less on tuition than on state appropriations; and the greater the number of universities per board, the less the reliance on tuition. The more centralized the board structure, the greater the number of students per teacher and the greater the number of tenured versus untenured faculty. Given these findings, it follows that public universities can be made to function more like private ones by placing them under separate boards (Toma 1990). 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).

Lowry (2000) examines two governance factors that might influence tuition: 1) the structure's degree of centralization and 2) the internal or external election of members of the board of trustees. He reasons that elected officials will generally prefer lower tuition and spending by state universities than will campus administrators and faculty, and governance features that increase elected officials influence will lead to lower costs. Trustees selected by public officials or the general public rather than by internal university constituencies define external election. Lowry uses the same measure of centralization as McGuinness and the state structures book: a consolidated governing board, a federal system with a single coordinating board overseeing several governing boards, and governing boards for individual institutions.

His findings show that two general profiles influence spending and tuition. One profile consists of a university with an average board (defined as the natural log of the percent of external trustees held constant at the sample mean) in a consolidated or federal state or a university in a state with an average degree of centralization of governance structure and 100 percent externally selected trustees. The other profile consists of a university with an average board in a decentralized state, or a university in an average state with only 50 percent externally

elected trustees. The difference between these two profiles results in a net price increase of \$1050-1150 per student in tuition and a spending increase of \$525-650 per student for instruction and \$100-285 per student for student services. In addition, academic support spending increases by \$200-300 per student in states without a coordinating board.

Lowry (2000) concludes that, “These results imply that governmental structure and process are more important than statutory directives that seek to regulate the substance of tuition decisions.” He adds that, “Public universities in systems that enhance the ability of elected officials to enforce their own preferences tend to charge lower tuition than public universities that have more autonomy. The difference in revenue is reflected in spending on functions that most directly benefit faculty and administrators.” The findings also show that “different combinations of structure and process can lead to very similar outcomes.” Structure alone does not determine tuition outcomes but only in combination with the electoral process (Lowry, 2000).

D. Institutional Quality

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. In contrast, the study by Eykamp (1995) finds that “Decision making autonomy explains between one-third and one-half of a standard deviation in university quality.” He especially notes that financial autonomy is the most important predictor of quality, including the presence of external grant funding. In addition, institutional quality can be predicted by constitutional autonomy, speed of appointments made to the board by the governor, and campus size.

II. Research Framework

In this paper we focus on the effects of governance structure on revenues and research activity rather than on decision making or policy coordination. We address some of the limitations of earlier studies of higher education governance systems using an extensive data set. 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 how the higher education system functions. Our study utilizes a time-series cross-sectional data set that spans the period 1987 to 1997 for comprehensive and Ph.D.-granting public universities.¹ Following Waller et al (2000) and Lowry (2000), we utilize the classification scheme of higher education governance systems from the *State Postsecondary Education Structures Handbook* (1991, 1994, 1997).

In many states, governance boards operate at two levels. The first level is statewide. This board usually has oversight for all four-year public postsecondary institutions.² In most cases there is only one state-level board responsible for four-year public universities. A few states, however, have more than one board at the state level. In this case, one board has more regulatory responsibilities than the other boards. We use the *State Postsecondary Education Structures Handbook* to classify higher education governance systems. As described above, the scheme

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 2 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. A list of the institutions studied is provided in Appendix I.

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.

classifies higher education systems as 1) consolidated governing boards, 2) coordinating boards, and 3) state planning agencies.

Using this scheme, we classify the board based on the degree of regulatory authority, how its members were chosen, and the composition of the members. State consolidated governing boards have regulatory authority over both program approval and budget. State coordinating boards may or may not have regulatory authority over the budget and/or program approval. We divided this classification into three sub-classifications: those with regulatory authority over the budget and program approval; those with regulatory authority over the budget or program approval; and those with only advisory authority over the budget and program approval.

With respect to the composition of the state-level board, we focused on the method by which members are appointed. We identified whether a majority (60 percent) of the voting members are appointed by the governor. If a member is not appointed by the governor, he or she may be appointed by the legislature, may serve automatically because of a position held in state government or in a university, may be elected by members affiliated with the university (e.g. by the students), or may be elected by the general public. Because the majority of states today allow the governor to appoint a large portion of the members to the state-level board, we created two other measures that could affect the boards' decisions. First, we identify whether there is at least one member that is elected by the general public. Second, we identify the number of members serving on the board that must be affiliated with one or more of the universities over which the board has oversight power. These members could be students, faculty, or administrators of the universities.

Table 1 shows the distribution of the state-level governance structures. We have classified the states in Table 1 by type of classification scheme as they existed in 1990, and noted

the changes that occurred by 1994 and 1997. In addition, we have identified the number of institutional boards per state, the number of universities and the number of research/doctoral universities per state included in our sample. Across all states, the average number of institutional boards per state is three, the average number of universities is nine, and the average number of research/doctoral universities is three.

In 1991, there were 22 states with a state-level governing board; this number increased to 24 by 1997. There were 9 states with a coordinating board with regulatory powers over the budget and program approval; this number increased to 15 by 1997. There were 11 states with a coordinating board with some regulatory powers; this number decreased to six by 1997. There were three states with a coordinating board with advisory powers; this number stayed the same in 1997 but the states with this type of board changed. There were five states with only a planning agency in 1991; this number decreased to two by 1997. Thus, between 1991 and 1997, there was an increase in the number of states with a governing board with more regulatory power. Across the regions, there is no consistent pattern of statewide board authority.

Table 2 shows the method of appointment on the state-level governing boards for the period under study. The first column shows whether a majority of the voting board members are appointed by the governor (more than 60 percent). The second column reports the number of members that are elected by the general public. The third column reports the number of internal voting members serving on the board. An internal member is usually a student, faculty member, or university administrator. The category we do not depict are those members that are appointed through other means; typically this would be appointment by the legislature. The table reveals that the majority of the members serving on statewide boards are appointed by the governor.

Only a few states deviate from this. Twenty-six states have at least one internal member serving on the statewide board.

To examine the differences that may be attributable to governing structure, we focus, in detail, on three measures: total current revenue, tuition revenue, and state and local appropriations. We summarize the results for other measures such as: enrollment, the number of graduate students, in-state and out of state tuition rates, endowment, alumni donations, research funding, and academic publications.³ Our analysis focuses on two relationships. First, we explore basic relationships among universities that have a similar state level governing board, differentiating among Ph.D. granting universities that have a medical school, Ph.D. granting universities that do not have a medical school, and non-Ph.D. granting institutions. Second, we examine the differences across universities utilizing a regression technique that will allow us to explore in more detail the differences in the state and local governing structures under which the universities operate.

III. Results

A. Comparison of Universities Based on State Level Governance Structure

For our first level of analysis, we concentrate on one dimension of state governance of universities and focus on differences in various resource measures based on whether a university is in a state with a governing board, coordinating board, or planning agency as the primary structure for state level oversight of these institutions. Thus, our focus is on the average level of

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 private donations are from the Council for Aid to Education. 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.

resources available to universities based on the type of state governance structure under which they operate. Given, however, that universities that offer Ph.D. degrees may differ slightly in their missions relative to non-Ph.D. granting universities, we examine the measures separately for these two types of institutions. Furthermore, because resources at Ph.D. granting universities may be affected differently if the university has a medical school affiliated with it, we also distinguish between those Ph.D. universities with a medical school and those without a medical school. Thus, a university will fit into one of nine categories of classification based on the three types of governance structures and the three types of institutions.

Table 3 reports the average enrollment, total revenue, state appropriations, tuition revenue, endowment, alumni donations, total research funding, and academic publications across the nine types of institutions. Because the institutions vary dramatically with respect to size, the revenue, appropriations, tuition, and endowment measures are divided by the number of full time undergraduate students at the institutions. The research funding and articles measures are divided by the number of faculty at the institutions. The alumni donations measures, however, are not adjusted.

With respect to enrollment, on average, there are more students at the research universities with an affiliated medical school than at the other types of universities. Across all three types of universities, the average enrollment is highest for those in states with a more decentralized governing board. This phenomenon may reflect, in part, that universities in more decentralized states have greater flexibility in setting tuition rates and, thus, rely more on tuition revenue than on state appropriations. As such, if a university relies on tuition revenue, there is an incentive to maintain a higher enrollment by this university than at a university that does not rely as much on tuition revenue. Across the other measures, the biggest differences are at the

research universities that have a medical school. For this group of universities, most of the revenues and other resources are greatest at those universities in states with a coordinating board or a planning agency. The universities in states with a planning agency have the highest level of tuition revenue, endowment per student, and alumni donations. The universities in states with a coordinating board have the highest level of total funding per student, state appropriations per student, and research funding and articles published per faculty.

For the group of research universities with a medical school, the differences in the average level of resources across the universities based on governance type is more dramatic than for universities without a medical school. With the exception of the average endowment per student and the total research funding per student, there is very little difference in the average values of the resources at the research universities without a medical school in states with a consolidated governing board and those in states with a coordinating board. Given there are very few flagship institutions without a medical school, this potentially suggests that the role played by a governing board and a coordinating board are very similar at non-flagship institutions.

For the comprehensive universities, there are very few dramatic differences in the average values of the resources based on the state governance types. Thus, based on the averages reported in Table 3, the most dramatic differences in resources based on state governance structure is seen at those research universities that have an affiliated medical school. With the exception of a few states, these universities are typically the flagship university. Thus, these initial results suggest that state governance may have the greatest effect on flagship universities and less of an effect on the other public universities located in the state.

To explore the statistics reported in Table 3 further, figures 1 through 8 reflect the average level of resources over time. Thus, the figures allow us to depict how the various

resources have grown over time, based on the institution and governance classifications. Figure 1 depicts the average total revenue at the institutions. Across all years, the average revenue per student is highest for those universities that grant a Ph.D. and have a medical school. Within these institutions, the lowest level of revenue is at those universities with a governing board; the highest is at those universities with a coordinating board. The growth in total revenue at these institutions is fairly steady at those institutions with a state level coordinating board or planning agency. In contrast, total revenue is fairly flat at those institutions with a state level consolidated governing board. With respect to the institutions with a planning agency, there is a small spike in total revenue around 1992. This reflects the change from a planning agency to a more centralized board in Vermont, Nebraska, and West Virginia. With respect to the two other types of institutions (Ph.D. granting but no medical school and non-Ph.D. granting), there is very little difference in the average total revenue based on governance structure. In addition, the average growth in total revenue is fairly flat.

Figure 2 depicts the average level of tuition revenue per student. Across all years, tuition revenue is highest for universities with a medical school in states with a planning agency. Universities without a medical school in states with a planning agency and universities with a medical school in states with a coordinating board are also quite high. The average tuition revenue per student for these three groups of universities steadily increases over the sample period. The average tuition revenue curves for the other types of institutions are indistinguishable for most of the period. The exception is for universities with a medical school in a state with a consolidated governing board and universities without a medical school in a state with a coordinating board. During the latter half of the sample period, the average tuition revenue increases faster for these institutions than for the remaining groups of institutions.

Figure 3 depicts the average state appropriations per undergraduate enrollment during the sample period. Across all types of institutions, the state appropriations are fairly flat across all years and somewhat declining, suggesting that state appropriations followed a growth slightly less than inflation. The highest level of state appropriations is for those universities with a medical school in a state with a coordinating board. Comparing across the three types of institutions, state appropriations are highest, overall, for universities with a medical school and lowest for institutions that do not offer a doctoral program.

Figure 4 combines the average state appropriations and tuition revenue per undergraduate enrollment to reflect total revenue associated with tuition and state appropriations. Given there is some evidence that state appropriations and tuition revenue may be viewed as tradeoffs by state legislatures, it is important to examine the net effect of both of these sources of revenues. Across the groups of institutions, the highest revenue from these two sources is for those universities with a medical school and the lowest revenue is for those institutions that do not offer a Ph.D. There is a difference in these revenues based on governance type, however, only for those universities with a medical school. Figure 4 reveals that the highest level of revenue from these two sources is for those universities in a state with a coordinating board in the first half of the sample period and for those universities in a state with a planning agency in the second half of the sample period. The change in these averages is, most likely, associated with the movement from a planning agency to a more centralized structure by Nebraska, Vermont, and West Virginia.

Figure 5 depicts the differences in endowment per student during the sample period. The highest levels across the sample period and the most growth in endowment is seen at those

universities with a medical school in a state with a planning agency or coordinating board and at those research universities without a medical school in a state with a planning agency.

Figure 6 depicts the differences in alumni donations during the sample period. On average, alumni donations play a significant role for the Ph.D. granting universities with a medical school and a lesser role for the other types of institutions. Within the Ph.D. granting universities with a medical school, average donations are larger at those institutions in states with a planning agency, especially in the latter half of the sample period. The average alumni donations for those universities in states with a consolidated governing board are slightly higher than the donations for those universities in states with a coordinating board.

Figure 7 depicts the differences in total research funding per faculty during the sample period. Not surprisingly, the highest level of research funding is at those universities with a medical school. Interestingly, however, within the two types of Ph.D. universities, the highest level of total research funding based on the governance structure is different. For the universities with a medical school, the highest level of research funding is at those universities in a state with a coordinating board. The highest level of research funding for those universities without a medical school is at those in a state with a consolidated governing board. Figure 7, thus, suggests that governance structure may have a different effect on research funding based on whether an institution has a medical school.

Figure 8 depicts the differences in articles published per faculty during the sample period for the Ph.D. universities. There are more articles published per faculty at the universities with a medical school than at the universities without a medical school. Within each type of universities, there are more articles published at universities in states with a coordinating board.

There is little difference in the average number of articles published at universities in states with a consolidated governing board and at universities in states with a planning agency.

Table 3 and the figures suggest, in general, that more resources are available at universities with a medical school than universities without a medical school and the comprehensive universities. With respect to governance structure, the data suggest that more resources are available to universities in states that do not have a consolidated governing board if these universities have a medical school.

B. Comprehensive Differences in State and Local Governing Structures

Although the analysis in the previous section illustrates difference among universities based on the state level governance structure, a more extensive analysis is needed. First, the above analysis does not take into account details of the state level governance structure such as how the members on the state level boards are appointed as well as the oversight responsibilities of the state level board. Second, we do not control for lower level governance structures for the universities. For example, in California, although there is a state level coordinating board that has only advisory powers over the University of California institutions, California State institutions, and community colleges, there are also separate boards that oversee each of the three types of institutions. These separate boards 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 that both a decentralized state level board and the effect of the multi-campus structure of the University of California system to capture the impact of the governance on each of the University of California campuses.

Third, we do not control for differences at the regional or university level that may affect the operations of the universities. If some universities have longstanding reputations within the

state or the nation, we might expect these universities to have more resources than universities that have been recently established.

To explore in more detail the effect of different aspects of the governance structures, we employ a regression analysis. The regression analysis uses a set of measures to reflect the state level and institutional level factors that could affect the impact of governance structures on universities. We control for the size and other characteristics of the university by including a dummy variable equal to one if the university has a medical school on campus, a dummy variable equal to one if the university is classified as a research or doctoral university, and measures for the undergraduate enrollment of the institution. To control for the conditions of the state in which the university is located, we include state level political, economic, and demographic measures.⁴ To control for macro level changes that affect all universities similarly we include a year trend effect.

We estimate the effect of the governance structures on universities using two specifications. The first specification uses regional fixed effects. The regional fixed effects are designed to capture non-time varying measures that all universities within the region share that makes those institutions different from institutions located in other regions. For example, we might expect that public universities in the Northeast operate differently from those in the Midwest or the West because they cater to different types of students, different industries, and/or different levels of competition from private universities. The second specification uses university fixed effects. The university fixed effects capture non-time varying aspects of the university that could affect the incentives and/or operations at the university. For example, we may expect that

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 percent of the population that is poor, old and young.

the characteristics of the revenues, costs, and demographics of the University of Illinois at Urbana to be different from those of Ohio State University given the history and location of the two universities. Because many of the governance measures do not vary over time we interact these measures with a year trend. Thus, in this specification, the coefficients on these measures reflect the impact of the governance structures on the growth of the measure used as the dependent variable. In addition, because universities with medical schools may have grown differently from universities without medical schools, we interact the dummy variable that indicates whether the institution under study has a medical school with a year trend effect. We also created a set of dummy variables to reflect different sizes of the institutions and interact these dummy variables with a year trend effect.

It is important to note that the regression analysis reflects a reduced form analysis. This means that the governance measures may have a direct or indirect effect on the measure we are interested in. Thus, we are not specifically exploring causality issues. For example, the number of articles published is likely to be a function of the level of research funding. Governance structure may, thus, have a direct effect on the level of research funding but only an indirect effect on the number of articles published.

Columns 1 and 2 of Table 4 reports the regression results when total revenue is used as the dependent variable. We report only those coefficients related to the governance structure of the state and institutional level boards, the dummy variables for research/doctoral institution and medical school, and the time trend. The other measures (enrollment levels, state level measures, and region or university effects) were included in the regression but are not reported. The coefficients in bold are statistically significant at less than 5 percent; the coefficients in italics are statistically significant at less than 10 percent.

Column 1 reports the results for which the regional fixed effects are used in the regression. The coefficients suggest that having a state level governing board and having a majority of the members of the state and institutional level board appointed by the governor negatively affects total revenues. The coefficient on the dummy variable that is equal to one if the state level board is a governing board is -28.59 , suggesting that, on average, a governing board decreases total revenues by \$29 million. Given the average total revenue across all institutions is \$185 million, this suggests an average decrease of 15 percent. The coefficient on the measure for those state level governing boards that have a majority of the members appointed by a governor is small and imprecisely measured, meaning the coefficient is not statistically different from zero and that we can draw no conclusions about its impact. With respect to those universities with a state level coordinating board, on average, total revenue is lower by \$26 million if the majority of the members are appointed by the governor. The average revenue is higher by \$61 million for coordinating boards with only advisory powers, representing an average increase of 33 percent. The other coefficients suggests that having members on the institutional board that are publicly elected increase revenues, as does being a research/doctoral university with a medical school. Across all universities, the average increase in revenues is \$2.8 million.

Column 2 reports the results for which the university fixed effects are used in the regression. These results help to control for time-invariant heterogeneity across the universities. The coefficients represent a trend effect on the governance measures. The results suggest a negative trend in revenue growth for those universities with a state level governance board with more regulatory powers. For example, on average, total revenue has declined \$2.1 million per year (or 1 percent) for universities in states with a governing board; total revenue has declined an

average of \$3.3 million per year (or 2 percent) for universities with a coordinating board with regulatory powers over the budget and programs. On average, total revenues have grown in universities with a multi-campus institutional board, but by not as much if the majority of the members on the institutional board are appointed by the governor. Surprisingly, having more than one internal member on the institutional level board resulted in a decline of total revenues. The most growth in revenue is seen in research/doctoral universities and those universities with a medical school. The average growth across all universities (via the year trend measure) was \$4.4 million per year.

Columns 3 and 4 report the results when tuition revenue is used as the dependent variable. Being a research or doctoral university and having a medical school results in the highest level of tuition revenue. The results suggest that greater regulation at the state level decreases tuition revenue. In addition, the results suggest tuition revenue is higher if the majority of the governing board members are appointed by a governor. The trend for this measure after controlling for heterogeneity across universities, however, is negative. The results also suggest that universities located in a state with multiple institutional level boards have higher tuition revenues as do universities governed by institutional level boards with elected members on the board. Using the specification that includes institutional fixed effects, on average, tuition revenue has declined \$2.76 million (or 9 percent) at the universities in a state with a consolidated governing board for which the majority of the members are appointed by the governor. In contrast, tuition revenue has declined \$2.23 million (or 7 percent) at the universities in a state with a coordinating board with regulatory powers over the budget and program approval and whose members are primarily appointed by the governor.

Columns 5 and 6 report the results when the state appropriations measure is the dependent variable. The governing structure does not have a significant impact on appropriations when only the regional fixed effects are used in the regression. When the university fixed-effects are included in the regression and the measures reflect the role of the governing structure on the growth of appropriations, however, the results suggest a positive trend in appropriations for those universities with a highly regulated governing board. The average growth in appropriations (\$2.6 million) is similar to the average decline in tuition revenue (\$2.4 million). As confirmed when the sum of appropriations and tuition revenue is used as the dependent variable, the effect from having a highly regulated governing board on the revenue collected from these two sources is not statistically different from zero. Thus, the results suggest that there are differences in the distribution of appropriations and tuition revenue based on the type of state level governing board.

We summarize the key findings from our regression analysis for all of the university resources we studied in Table 5. Each row in Table 5 represents a resource that was used as a dependent variable in the regression analysis. Each column identifies one of the controls we used to identify the state and institutional level governance structures in the regression analysis. A “+” sign indicates that the control increases the resources to the university, a “-“ sign indicates the control decreases the resources to the university, a “0” indicates the coefficient on the control is not significantly different from zero, and a “?” indicates the relationship is unclear. The first sign is the effect from the regression that uses regional fixed effects; the second sign is the effect from the regression that uses the university fixed effects as explained above.

In Part A of Table 5, columns (1a) to (1d) reflect the indicators that identify the type of state level board in the regressions. Column (1a) reports the effect of having a more

decentralized state level board. We consider a more decentralized board as one that is a planning agency or a coordinating board with only advisory powers. Across the various university resources, on average, the resources are higher and grow faster at universities in states with a more decentralized governance structure. Column (1b) reports the effect of having the majority of the state level board members appointed by the governor, column (1c) reports the effect of having at least one member that is elected, and column (1d) reports the effect from having internal members on the state level board. For the majority of the university measures, the effect of having the majority of the members appointed by the governor is negative, suggesting that having a more centralized board with governor appointed members decreases the various university resources. There are very few measures that are statistically significantly affected by having a member on the state level board that is elected or affiliated with the institutions within the state.

The columns in Part B of Table 5 report the effects of the structure and composition of the institutional level boards on the university resources. Column (2a) reflects the effect of having multiple institutional level boards within the state. For most of the measures, having more institutional level boards increases university resources. To the extent that multiple boards proxies having a board that oversees a single campus instead of multiple campuses, the results suggest that in states in which universities operate independently of each other are more likely to have universities with more abundant resources. This result, however, is tempered when we explore whether the board that oversees the university understudy is responsible for multiple or a single campus. If compared to universities that have no campus level board (most of the states with a consolidated governing board), both the multiple and single campus boards increase the level of most of the university resources. Comparing a multiple and single campus board,

however, the results are less clear. For both multiple and single campus boards (columns 2b2 and 2c3), having the majority of the members appointed by the governor decreases the majority of the resources. Having members that are elected to the board (column 2d), however, increases the majority of the resources. The role of internal members on the board is less clear (column 2e). On average, in-state tuition rates, faculty salaries, and state research funding has increased over time. State appropriations, total revenue, endowments, donations, and other measures, however, have decreased over time.

The regression results provide additional details that the summary statistics and the figures could not provide. In general, the regression results continue to support the notion that resources are more abundant at universities in states with a more decentralized state governance structure. Moreover, resources are greater in states in which the governor does not appoint the majority of the board members. The results also suggest that having several institutional level boards increases resources. The results fail to suggest, for most measures, that having internal members on the boards increases the various resources.

IV. Summary

The strengths and weaknesses of different higher education governance structures are mediated by historical and geographical factors. Universities reside in states and regions of the country that 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.

The literature on higher education governance also makes the argument 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.

Our analysis and a few articles demonstrate, however, that governance structures do influence several important performance features of public universities. In particular, 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. How members of the board are appointed, whether internally to the system, or more externally through election or state government appointment, has a similar kind of impact. The more external the appointment, the more statewide political priorities come to influence features of the universities in the system. Decentralized systems tend to behave more like private institutions that rely more on tuition revenue and research dollars rather than state appropriations.

Our analysis suggests that the effects are stronger for research universities that have a medical school on campus. The regression results, however, do suggest that governance structures at the state and institutional level affect the distribution of resources across the universities, after controlling for the university having a medical school. While governance is an important factor in determining performance, it is important to note that it is not the only factor and 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.

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Appendix I: List Institutions Studied

	Research/ Doctoral	Multi- Campus		Research/ Doctoral	Multi- Campus
Region 1					
<i>Connecticut</i>			<i>Maine</i>		
Univ. of Connecticut	Yes	Yes	Univ. of Maine	Yes	No
Central Conn. State Univ.	No	Yes	Univ. of Southern Maine	No	No
Western Conn. State Univ.	No	Yes	<i>New Hampshire</i>		
Southern Conn. State Univ.	No	Yes	Univ. of New Hampshire	Yes	Yes
Eastern Conn. State Univ.	No	Yes	Keene State College	No	Yes
<i>Massachusetts</i>			Plymouth State College	No	Yes
Univ. of Mass. Lowell	Yes	No	<i>Rhode Island</i>		
Univ. of Mass. at Amherst	Yes	No	Univ. of Rhode Island	Yes	No
Bridgewater State College	No	No	Rhode Island College	No	No
Fitchburg State College	No	No	<i>Vermont</i>		
Framingham State College	No	No	Univ. of Vermont	Yes	No
Salem State College	No	No	Castleton State College	No	Yes
Westfield State College	No	No	Johnson State College	No	Yes
Worcester State College	No	No			
Univ. of Mass. at Dartmouth	No	No			
Univ. of Mass. at Boston	No	No			
Region 2					
<i>New Jersey</i>			<i>New York</i>		
New Jersey Inst. Technology	Yes	No	City Univ. of New York	Yes	Yes
Rutgers the State Univ of NJ	Yes	Yes	SUNY at Albany	Yes	Yes
---New Brunswick	Yes	Yes	SUNY at Binghamton	Yes	Yes
---Newark Campus	Yes	Yes	SUNY Coll. of Environ. Sci & Fores	Yes	Yes
---Camden Campus	No	Yes	SUNY at Buffalo	Yes	Yes
Rowan College of New Jersey	No	No	SUNY at Stony Brook	Yes	Yes
Jersey City State College	No	No	CUNY Grad. School	Yes	Yes
Montclair State Univ.	No	No	CUNY Bernard M Baruch College	No	Yes
Kean College of NJ	No	No	CUNY Brooklyn College	No	Yes
William Paterson College	No	No	CUNY City College	No	Yes
The College of New Jersey	No	No	CUNY Herbert H Lehman College	No	Yes
<i>Pennsylvania</i>			CUNY Hunter College	No	Yes
Temple Univ.	Yes	No	CUNY Queens College	No	Yes
Indiana Univ. of PA	Yes	Yes	CUNY College of Staten Island	No	Yes
Pennsylvania State U	Yes	Yes	SUNY College at Brockport	No	Yes
Univ. of Pittsburgh	Yes	Yes	SUNY College at Buffalo	No	Yes
Lincoln Univ.	No	No	SUNY College at Cortland	No	Yes
Bloomsburg Univ. of PA	No	Yes	SUNY College at Fredonia	No	Yes
California Univ. of PA	No	Yes	SUNY College at Geneseo	No	Yes
Cheyney Univ. of PA	No	Yes	SUNY at New Platz	No	Yes
East Stroudsburg Univ. of PA	No	Yes	SUNY College at Oneonta	No	Yes
Edinboro Univ. of PA	No	Yes	SUNY College at Oswego	No	Yes
Kutztown Univ. of PA	No	Yes	SUNY College at Plattsburgh	No	Yes
Mansfield Univ. of PA	No	Yes	SUNY College at Potsdam	No	Yes
Millersville Univ. of PA	No	Yes	SUNY Inst. of Tech. at Utica/Rome	No	Yes
Shippensburg Univ. of PA	No	Yes			
Slippery Rock Univ. of PA	No	Yes			

West Chester Univ. of PA	No	Yes			
PA State U at Erie-Behrend Coll.	No	Yes			
PA State U, Harrisburg-Capital Col	No	Yes			
Clarion Univ. of PA,	No	Yes			
Region 3					
<i>Illinois</i>			<i>Ohio</i>		
Univ. of Ill. at Urbana-Champaign	Yes	Yes	Ohio State Univ.	Yes	Yes
Univ. of Illinois at Chicago	Yes	Yes	Miami Univ.	Yes	Yes
Univ. of Illinois at Springfield	No	Yes	Ohio Univ.	Yes	Yes
Illinois State Univ.	Yes	Yes	Univ. of Cincinnati	Yes	Yes
Northern Illinois Univ.	Yes	Yes	Wright State Univ.	Yes	Yes
Southern Ill. Univ.-Carbondale	Yes	Yes	Univ. of Akron	Yes	Yes
Eastern Illinois Univ.	No	Yes	Cleveland State Univ.	Yes	No
Northeastern Illinois Univ.	No	Yes	Univ. of Toledo	Yes	No
Chicago State Univ.	No	Yes	Bowling Green State Univ	Yes	No
Southern Ill. Univ. at Edwardsville	No	Yes	Kent State Univ.	Yes	No
Western Illinois Univ.	No	Yes	Youngstown State Univ.	No	No
Governors State Univ.	No	Yes			
<i>Indiana</i>			<i>Wisconsin</i>		
Indiana Univ.	Yes	Yes	Univ. of Wisconsin-Madison	Yes	No
Purdue Univ.	Yes	Yes	Univ. of Wisconsin-Milwaukee	Yes	No
IN Univ.-Purdue Univ at Indianapolis	Yes	Yes	Univ. of Wisconsin-Green Bay	No	No
Indiana Univ.-Purdue at Fort Wayne	No	Yes	Univ. of Wisconsin-Stout	No	No
Indiana Univ. at Kokomo	No	Yes	Univ. of Wisconsin-Eau Claire	No	No
Indiana Univ. Northwest	No	Yes	Univ. of Wisconsin-La Crosse	No	No
Indiana Univ. at South Bend	No	Yes	Univ. of Wisconsin-Platteville	No	No
Indiana Univ. Southeast	No	Yes	Univ. of Wisconsin-River Falls	No	No
Purdue Univ., Calumet Campus	No	Yes	Univ. of Wisconsin-Stevens Point	No	No
Indiana State Univ.	Yes	Yes	Univ. of Wisconsin-Superior	No	No
Ball State Univ.	Yes	No	Univ. of Wisconsin-Whitewater	No	No
Univ. of Southern Indiana	No	No	Univ. of Wisconsin-Parkside	No	No
			Univ. of Wisconsin-Oshkosh	No	No
<i>Michigan</i>					
Univ. of Michigan	Yes	Yes			
Univ. of Michigan at Dearborn	No	Yes			
Univ. of Michigan at Flint	No	Yes			
Michigan State Univ.	Yes	No			
Michigan Technological Univ.	Yes	No			
Wayne State Univ.	Yes	No			
Western Michigan Univ.	Yes	No			
Central Michigan Univ.	No	No			
Eastern Michigan Univ.	No	No			
Ferris State Univ.	No	No			
Grand Valley State Univ.	No	No			
Lake Superior State Univ.	No	No			
Northern Michigan Univ.	No	No			
Oakland Univ.	No	No			
Saginaw Valley State Univ.	No	No			

Region 4*Iowa*

Univ. of Iowa	Yes	No
Iowa State Univ.	Yes	No
Univ. of Northern Iowa	No	No

Kansas

Univ. of Kansas	Yes	No
Kansas State Univ.	Yes	No
Wichita State Univ.	Yes	No
Fort Hays State Univ.	No	No
Pittsburg State Univ.	No	No
Emporia State Univ.	No	No
Washburn Univ. of Topeka	No	No

Minnesota

Univ. of Minnesota	Yes	Yes
Univ. of Minnesota - Duluth	No	Yes
Bemidji State Univ.	No	Yes
Mankato State Univ.	No	Yes
Moorhead State Univ.	No	Yes
St Cloud State Univ.	No	Yes
Winona State Univ.	No	Yes
Metropolitan State Univ.	No	Yes

Nebraska

Univ. of Nebraska at Lincoln	Yes	Yes
Univ. of Nebraska at Kearney	No	Yes
Univ. of Nebraska at Omaha	No	Yes
Chadron State College	No	Yes
Wayne State College	No	Yes

Missouri

Univ. of Missouri, Columbia	Yes	Yes
Univ. of Missouri, Rolla	Yes	Yes
Univ. of Missouri, Kansas City	Yes	Yes
Univ. of Missouri, St Louis	Yes	Yes
Central Missouri State Univ.	No	No
Lincoln Univ. (Jefferson City, MO)	No	No
Truman State Univ.	No	No
Northwest Missouri State Univ.	No	No
Southeast Missouri State Univ.	No	No
Southwest Missouri State Univ.	No	No

North Dakota

Univ. of North Dakota	Yes	No
North Dakota State Univ.	Yes	No
Minot State Univ.	No	No

South Dakota

Univ. of South Dakota	Yes	No
South Dakota State Univ.	No	No
Northern State Univ.	No	No

Region 5*Delaware*

Univ. of Delaware	Yes	No
Delaware State Univ.	No	No

Florida

Univ. of Florida	Yes	Yes
Florida State Univ.	Yes	Yes
Univ. of South Florida	Yes	Yes
Univ. of Central Florida	Yes	Yes
Univ. of West Florida	No	Yes
Univ. of North Florida	No	Yes
Florida Atlantic Univ.	Yes	Yes
Florida International Univ.	Yes	Yes
Florida Agric. & Mechanical Univ.	No	Yes

Georgia

Univ. of Georgia	Yes	No
Georgia State Univ.	Yes	No
Georgia Inst. of Technology	Yes	No

North Carolina

Univ. of NC at Chapel Hill	Yes	No
Univ. of NC at Greensboro	Yes	No
Univ. of NC at Pembroke	No	No
Univ. of NC at Charlotte	No	No
Univ. of NC at Wilmington	No	No
NC Agric. & Tech State Univ.	No	No
Appalachian State Univ.	No	No
NC State Univ. at Raleigh	Yes	No
East Carolina Univ.	No	No
Fayetteville State Univ.	No	No
North Carolina Central Univ.	No	No
Western Carolina Univ.	No	No

South Carolina

Univ. of South Carolina	Yes	Yes
Clemson Univ.	Yes	No
South Carolina State Univ.	No	No
Citadel Military College of SC	No	No

Albany State Univ.	No	No	College of Charleston	No	No
Armstrong Atlantic State Univ.	No	No	Lander Univ.	No	No
Augusta State Univ.	No	No	Winthrop Univ.	No	No
Columbus State Univ.	No	No	Francis Marion Univ.	No	No
Fort Valley State Univ.	No	No	Old Dominion Univ.	No	No
Georgia Southern Univ.	No	No			
Georgia Southwestern State Univ.	No	No	<i>Virginia</i>		
Kennesaw State Univ.	No	No	Univ. of Virginia	Yes	Yes
North Georgia College	No	No	VA Polytechnic Inst. & State Univ	Yes	No
Valdosta State Univ.	No	No	College of William and Mary	Yes	Yes
State Univ. of West Georgia	No	No	George Mason Univ.	Yes	No
Georgia College and State Univ.	No	No	Virginia Commonwealth Univ.	Yes	No
			Longwood College	No	No
<i>Maryland</i>			James Madison Univ.	No	No
Univ. of Maryland at College Park	Yes	Yes	Radford Univ.	No	No
Univ. of Maryland Baltimore Co.	Yes	Yes	Mary Washington College	No	No
Univ. of Maryland Eastern Shore	No	Yes	Virginia State Univ.	No	No
Bowie State Univ.	No	Yes	Norfolk State Univ.	No	No
Coppin State College	No	Yes			
Frostburg State Univ.	No	Yes	<i>West Virginia</i>		
Morgan State Univ.	No	Yes	West Virginia Univ.	Yes	Yes
Salisbury State Univ.	No	Yes	Marshall Univ.	No	Yes
Towson State Univ.	No	Yes			
Region 6					
<i>Alabama</i>			<i>Mississippi</i>		
Univ. of Alabama	Yes	Yes	Mississippi State Univ.	Yes	No
Univ. of Alabama at Birmingham	Yes	Yes	Univ. of Southern Mississippi	Yes	No
Univ. of Alabama in Huntsville	Yes	Yes	Univ. of Mississippi	Yes	No
Auburn Univ.	Yes	Yes	Alcorn State Univ.	No	No
Auburn Univ. at Montgomery	No	Yes	Delta State Univ.	No	No
Alabama Agric. & Mech. Univ.	No	No	Jackson State Univ.	No	No
Univ. of Montevallo	No	No			
Alabama State Univ.	No	No	<i>Tennessee</i>		
Univ. of North Alabama	No	No	Univ. of Tennessee at Knoxville	Yes	Yes
Jacksonville State Univ.	No	No	Univ. of Tennessee at Chattanooga	No	Yes
Univ. of West Alabama	No	No	Univ. of Tennessee at Martin	No	Yes
Troy State Univ.	No	Yes	Tennessee State Univ.	Yes	Yes
Troy State Univ. at Dothan	No	Yes	Univ. of Memphis	Yes	Yes
Troy State Univ. in Montgomery	No	Yes	Middle Tennessee State Univ.	Yes	Yes
Univ. of South Alabama	No	No	Austin Peay State Univ.	No	Yes
			East Tennessee State Univ.	No	Yes
<i>Kentucky</i>			Tennessee Technological Univ.	No	Yes
Univ. of Kentucky	Yes	Yes			
Univ. of Louisville	Yes	No			
Kentucky State Univ.	No	No			
Eastern Kentucky Univ.	No	No			
Western Kentucky Univ.	No	No			
Northern Kentucky Univ.	No	No			
Morehead State Univ.	No	No			
Murray State Univ.	No	No			

Region 7*Arkansas*

Univ. of Arkansas	Yes	Yes
Univ. of Arkansas at Little Rock	No	Yes
Arkansas State Univ.	No	Yes
Univ. of Central Arkansas	No	No
Henderson State Univ.	No	No
Arkansas Tech Univ.	No	No
Southern Arkansas Univ.	No	No

Louisiana

Louisiana State Univ	Yes	Yes
Louisiana State Univ in Shreveport	No	Yes
Louisiana Tech Univ.	Yes	Yes
Univ. of New Orleans	Yes	Yes
Univ. of Southwestern Louisiana	Yes	Yes
Nicholls State Univ.	No	Yes
Grambling State Univ.	No	Yes
McNeese State Univ.	No	Yes
Northeast Louisiana Univ.	No	Yes
Northwest State Univ.	No	Yes
Southeastern Louisiana Univ.	No	Yes
Southern Univ. A&M Col	No	Yes
Southern Univ. at New Orleans	No	Yes

Oklahoma

Univ. of Oklahoma	Yes	Yes
Oklahoma State Univ.	Yes	Yes
Univ. of Central Oklahoma	No	Yes
East Central Univ.	No	Yes
Northeastern State Univ.	No	Yes
Northwestern Okla. State Univ.	No	Yes
Southeastern Okla. State Univ.	No	Yes
Southwestern Okla.State Univ.	No	Yes

Region 8*Arizona*

Univ. of Arizona	Yes	No
Arizona State Univ.	Yes	No
Northern Arizona Univ.	Yes	No

Colorado

Univ. of Colorado	Yes	Yes
Univ. of Colorado at Denver	Yes	Yes
Univ. of Colo.at Colo. Springs	No	Yes
Colorado School of Mines	Yes	No
Univ. of Northern Colorado	Yes	No
Colorado State Univ.	Yes	Yes
Adams State College	No	Yes

Idaho

Univ. of Idaho	Yes	No
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Texas

Univ. of Texas at Austin	Yes	Yes
Univ. of Texas at Arlington	Yes	Yes
Univ. of Texas at Dallas	Yes	Yes
Univ. of Texas - Pan American	No	Yes
Univ. of Texas at Permian Basin	No	Yes
Univ. of Texas at San Antonio	No	Yes
Univ. of Texas at El Paso	No	Yes
Univ. of Texas at Tyler	No	Yes
Texas A&M Univ.	Yes	Yes
Texas A&M Univ.-Commerce	Yes	Yes
Texas A&M Univ. Kingsville	No	Yes
Texas A&M Univ.-Texarkana	No	Yes
Texas A&M Univ. Corpus Christi	No	Yes
Texas A&M International Univ.	No	Yes
Univ. of North TX	Yes	Yes
Texas Southern Univ.	Yes	No
Texas Tech Univ.	Yes	Yes
Texas Woman's Univ.	Yes	No
Univ. of Houston	Yes	Yes
Univ. of Houston-Clear Lake	No	Yes
Univ. of Houston-Victoria	No	Yes
Angelo State Univ.	No	Yes
Lamar Univ.-Beaumont	No	Yes
Midwestern State Univ.	No	No
Sam Houston State Univ.	No	Yes
Southwest Texas State Univ.	No	Yes
Stephen F Austin State Univ.	No	No
Sul Ross State Univ.	No	Yes
Prarie View A&M Univ.	No	Yes
Tarleton State Univ.	No	Yes
West Texas A&M Univ.	No	Yes

New Mexico

Univ. of New Mexico	Yes	Yes
New Mexico Highlands Univ.	No	No
Western New Mexico Univ.	No	No
Eastern New Mexico U	No	Yes

Nevada

Univ. of Nevada-Reno	Yes	No
Univ. of Nevada-Las Vegas	No	No

Utah

Univ. of Utah	Yes	No
Utah State Univ.	Yes	No
Southern Utah Univ.	No	No
Weber State Univ.	No	No

Idaho State Univ.	Yes	No	<i>Wyoming</i>		
Boise State Univ.	No	No	Univ. of Wyoming	Yes	No
<i>Montana</i>					
Univ. of Montana	Yes	No			
Montana State Univ. - Billings	No	No			
Montana State Univ. - Bozeman	Yes	No			
Montana State Univ. - Northern	No	No			
Montana Tech	No	No			
<hr/>					
Region 9					
<i>California</i>			<i>Alaska</i>		
Univ. of California-Berkeley	Yes	Yes	Univ. of AK Fairbanks	Yes	Yes
Univ. of California-Davis	Yes	Yes	Univ. of AK Anchorage	No	Yes
Univ. of California-Irvine	Yes	Yes	Univ. of AK Southeast	No	Yes
Univ. of California-Los Angeles	Yes	Yes			
Univ. of California-Riverside	Yes	Yes	<i>Hawaii</i>		
Univ. of California-San Diego	Yes	Yes	Univ. of Hawaii at Manoa	Yes	No
Univ. of California-San Francisco	Yes	Yes			
Univ. of California-Santa Barbara	Yes	Yes	<i>Oregon</i>		
Univ. of California-Santa Cruz	Yes	Yes	Univ. of Oregon	Yes	No
San Diego State Univ.	Yes	Yes	Oregon State Univ.	Yes	No
Calif. State Univ.-Fullerton	No	Yes	Portland State Univ.	Yes	No
Calif. State Univ.-Hayward	No	Yes	Western Oregon State College	No	No
Calif. State Univ.-Long Beach	No	Yes	Southern Oregon State College	No	No
Calif. State Univ.-Los Angeles	No	Yes			
Calif. State Univ.-Dominguez Hills	No	Yes	<i>Washington</i>		
Calif. State Univ.-San Bernardino	No	Yes	Univ. of Washington - Seattle	Yes	No
Calif. State Polytechnic U- San Luis Obispo	No	Yes	Washington State Univ.	Yes	No
Calif. State Polytechnic Univ. Pomona	No	Yes	Central Washington Univ.	No	No
Calif. State Univ.-Chico	No	Yes	Eastern Washington Univ.	No	No
Calif. State Univ.-Fresno	No	Yes	Western Washington Univ.	No	No
Humboldt State Univ.	No	Yes			
Calif. State Univ.-Sacramento	No	Yes			
Calif. State Univ.-Northridge	No	Yes			
San Francisco State Univ.	No	Yes			
San Jose State Univ.	No	Yes			
Sonoma State Univ.	No	Yes			
Calif. State Univ.-Stanislaus	No	Yes			
Calif. State Univ.-Bakersfield	No	Yes			
Calif. State Univ.-San Marcos	No	Yes			

Figure 1: Ave Total Revenue Per Student

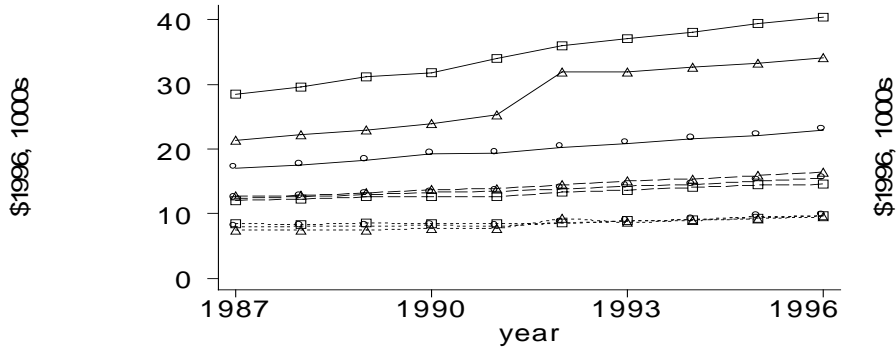


Figure 2: Ave Tuition Revenue Per Student

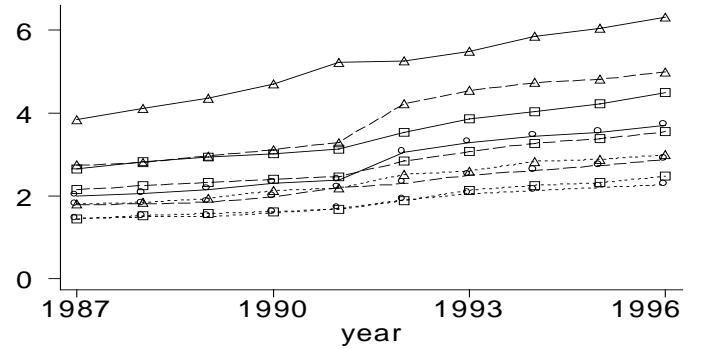


Figure 3: Ave State Appropriations Per Student

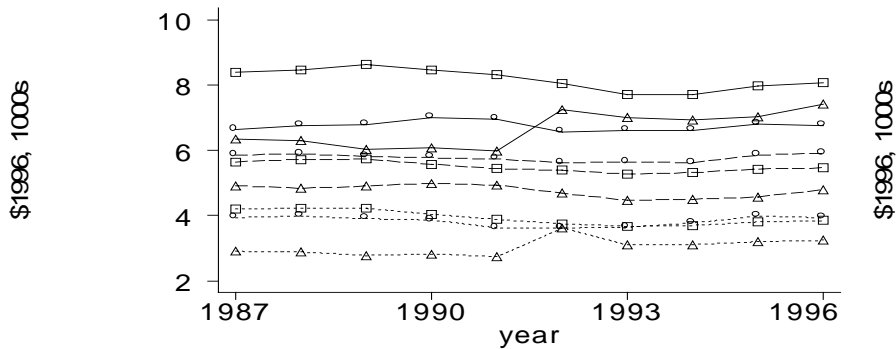
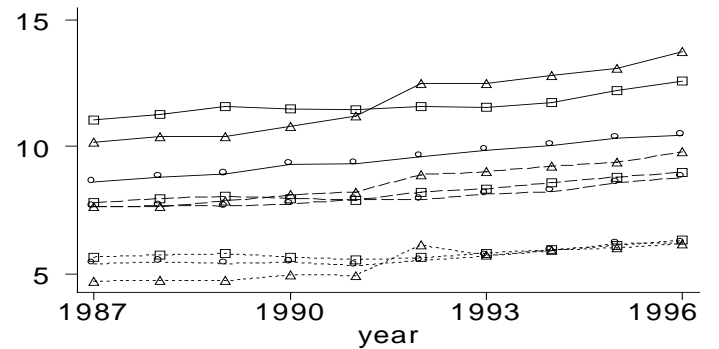


Figure 4: Ave Tuit. + Appms. Per Student



solid - PhD w/Med, dash - PhD no med, dot - no PhD
 O - Gov Bd, Square - Coor Bd, Triangle - Plan Ag

Figure 5: Ave Endowment Per Student

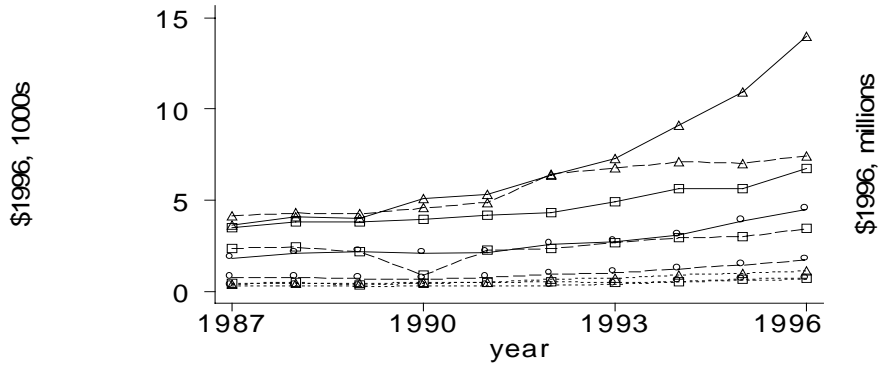


Figure 6: Ave Alumni Donations

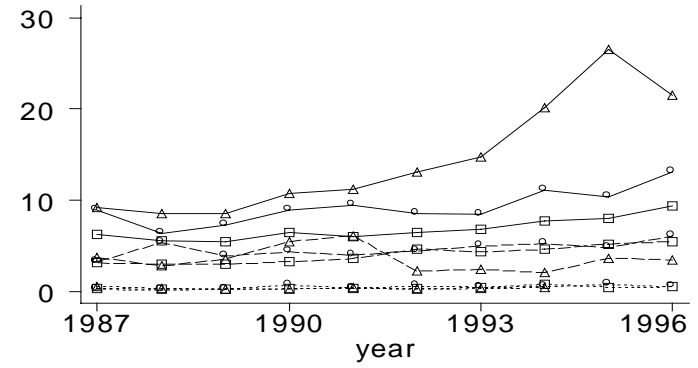


Figure 7: Ave Total Research Funding Per Faculty

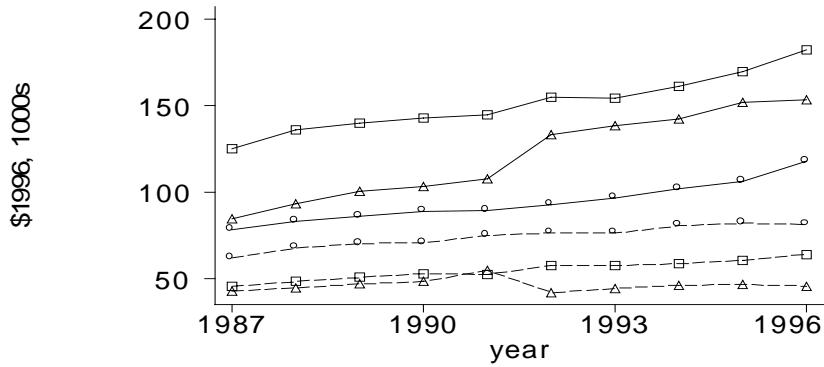
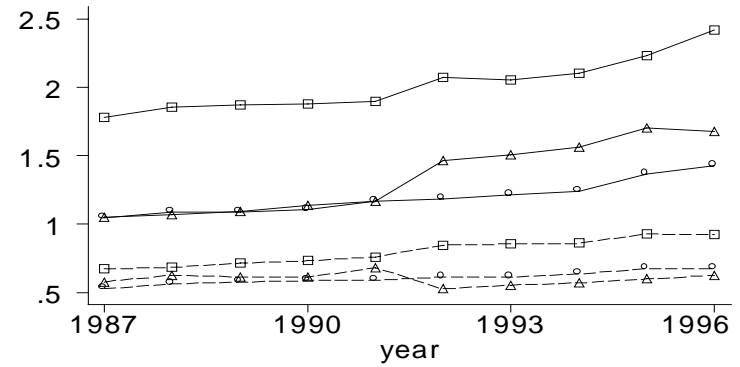


Figure 8: Ave # Articles Published Per Faculty



solid - PhD w/Med, dash - PhD no med, dot - no PhD
 O - Gov Bd, Square - Coor Bd, Triangle - Plan Ag

Table 1: State Governance Structure, 1990

State	Region	# Institutional Boards	# Universities	# Research Universities	Changes Since 1990	By Year
Consolidated Governing Board						
Maine	1	0	2	1		
Massachusetts	1	0	10	2	Coord Bd, Some Reg; 1 Inst'l Bd	1990
					Coord Bd, All Reg	1997
New Hampshire*	1	1	3	1		
Rhode Island	1	0	2	1		
Wisconsin	3	0	31	2		
Iowa	4	0	3	2		
Kansas	4	0	7	3		
North Dakota	4	0	3	2		
South Dakota	4	0	3	1		
Florida*	5	1	9	6		
Georgia	5	0	15	3		
North Carolina	5	0	12	3		
Mississippi	6	0	6	3		
Arizona	8	0	3	3		
Idaho	8	0	3	2		
Montana	8	0	5	2		
Nevada	8	0	2	1		
Utah	8	0	4	2		
Wyoming	8	0	1	1	1 Inst'l Bd	1997
Alaska*	9	1	3	1		
Hawaii	9	0	1	1		
Oregon*	9	0	5	3		
Coordinating Board, All Regulated						
Connecticut	1	2	5	1		
New Jersey	2	8	10	3	Coord Bd, Some Reg	1997
Illinois	3	4	12	5	9 Inst'l Bd	1997
Ohio	3	11	11	10		
Maryland	5	2	9	2		
South Carolina	5	8	8	2		
Alabama	6	10	15	4		
Arkansas	7	6	7	1		
Oklahoma	7	3	8	2		
Coordinating Board, Some Regulated						
New York	2	2	25	7		
Pennsylvania	2	4	19	4	Coord Board, Adv	1994
Indiana	3	6	12	5	Coord Bd, All Reg	1997
Missouri	4	7	10	4	Coord Bd, All Reg	1997
Virginia	5	12	12	6		
Kentucky	6	8	8	2	Coord Bd, All Reg	1997
Tennessee	6	2	9	4	Coord Bd, All Reg	1997
Louisiana	7	3	13	4	Coord Bd, All Reg	1997
Texas	7	11	31	10		
Colorado	8	5	7	5	Coord Bd, All Reg	1997
Washington	9	5	5	2		
Coordinating Board, Advisory						
Minnesota	4	2	8	1	Gov Bd	1997
New Mexico	8	4	4	1		
California	9	2	29	10		
Planning Agency Only						
Vermont	1	2	3	1	Gov Bd	1994
Michigan	3	13	15	5		
Nebraska	4	2	5	1	Coord Bd, Some Reg	1994
Delaware	5	2	2	1		
West Virginia	5	0	2	1	Gov Bd	1994

Table 2: Other Characteristics of Governance Structure

State	Region	>60% Gov Apptd	# of Elected Members	# of Internal Members	Changes Since 1990	By Year
Consolidated Governing Board						
Maine	1	Yes	0	1		
Massachusetts	1	Yes	0	1	0 Internal	1997
New Hampshire*	1	Yes	0	17		
Rhode Island	1	Yes	0	0	1 Internal	1994
Wisconsin	3	Yes	0	2		
Iowa	4	Yes	0	0		
Kansas	4	Yes	0	0		
North Dakota	4	Yes	0	1		
South Dakota	4	Yes	0	1	2 Internal	1994
Florida*	5	No	7	0		
Georgia	5	Yes	0	0		
North Carolina	5	No	0	0		
Mississippi	6	Yes	0	0		
Arizona	8	Yes	0	1		
Idaho	8	Yes	0	1		
Montana	8	Yes	0	1		
Nevada	8	No	9	2	11 Elected	1994
Utah	8	Yes	0	1		
Wyoming	8	Yes	0	1	0 Internal	1994
Alaska*	9	No	0	8	6 Internal	1994
Hawaii	9	Yes	0	0		
Oregon*	9	Yes	0	2		
Coordinating Board, All Regulated						
Connecticut	1	Yes	0	0		
New Jersey	2	No	0	7	Maj. Gov Appt 8 Internal	1997
Illinois	3	Yes	0	6	3 Internal	1997
Ohio	3	Yes	0	0		
Maryland	5	Yes	0	1		
South Carolina	5	Yes	0	0	Not Maj. Gov Appt 4 Internal	1994 1997
Alabama	6	Yes	0	0		
Arkansas	7	Yes	0	0		
Oklahoma	7	Yes	0	0		
Coordinating Board, Some Regulated						
New York	2	No	0	0		
Pennsylvania	2	Yes	0	3		
Indiana	3	Yes	0	0	2 Internal	1994
Missouri	4	Yes	0	0		
Virginia	5	Yes	0	0		
Kentucky	6	Yes	0	9	10 Internal	1994
Tennessee	6	Yes	0	1	2 Internal	1997
Louisiana	7	Yes	0	1	0 Internal	1994
Texas	7	Yes	0	0	1 Internal	1997
Colorado	8	Yes	0	0		
Washington	9	Yes	0	0		
Coordinating Board, Advisory						
Minnesota	4	Yes	0	1		
New Mexico	8	Yes	0	0		
California	9	No	0	6	8 Internal	1994
Planning Agency Only						
Vermont	1	Yes	0	2	Maj. Leg Appt	1994
Michigan	3	Yes	0	0	8 Elected, Not Majority Gov. Appt	1994
Nebraska	4	Yes	0	5	0 Internal	1994
Delaware	5	Yes	0	6	8 Internal	1994
West Virginia	5	Yes	0	2		

Table 3: Summary Statistics By Governance Type

Resource or Productivity Measure	Research Universities w/ Medical School			Research Universities (No Med Sch)			Comprehensive Universities		
	Gov. Board	Coor. Board	Planning Ag.	Gov. Board	Coor. Board	Planning Ag.	Gov. Board	Coor. Board	Planning Ag.
Undergraduate Enrollment	23654.31	25886.70	31637.78	17276.93	18687.67	18739.57	7137.56	8435.96	9588.61
Total Revenue Per Student*	20.05	34.57	26.74	13.77	13.25	14.22	8.60	8.78	8.15
Tuition Revenue Per Student*	2.83	3.47	4.95	2.25	2.78	3.70	1.82	1.90	2.27
State Appropriations Per Student*	6.74	8.18	6.51	5.77	5.49	4.78	3.83	3.93	2.99
Tuition Rev + State Appn Per Student*	9.57	11.64	11.46	8.02	8.27	8.48	5.65	5.83	5.25
Endowment Per Student	2.82	4.66	6.35	1.03	2.49	5.51	0.42	0.54	0.65
Alumni Donations	9.27	6.86	13.29	4.66	4.09	3.61	0.45	0.43	0.36
Total Research Per Faculty	94.73	150.80	115.04	74.14	54.99	46.40	9.33	6.86	5.35
Articles Published Per Faculty	1.20	2.02	1.28	0.61	0.80	0.60			

Note: Per student is measured as full time undergraduate enrollment; all dollars are constant (\$1996) and in 1000s.

Table 4: Regression Results

Dependent Variable	Total Revenue		Tuition Revenue		State Appropriations	
	(1)	w/trend (2)	(3)	w/trend (4)	(5)	w/trend (6)
State Board						
Governing Board	-28.59 (17.34)	-2.10 (1.08)	-6.77 (2.61)	-2.39 (0.32)	2.40 (4.64)	2.57 (0.33)
-- >60% Appointed by Governor	1.44 (11.95)	-0.80 (0.66)	7.98 (1.51)	-0.37 (0.13)	-8.38 (3.67)	-0.04 (0.21)
Coordinating Board	1.41 (16.07)	-2.70 (0.89)	-15.36 (2.50)	-1.74 (0.24)	13.12 (4.43)	-0.27 (0.22)
-- >60% Appointed by Governor	-25.69 (14.21)	-0.07 (0.61)	10.35 (2.11)	-0.29 (0.12)	-19.67 (3.41)	1.95 (0.17)
-- Regulates Budget & Programs	-9.87 (8.00)	-0.59 (0.36)	0.32 (1.25)	-0.20 (0.08)	-4.46 (2.22)	0.25 (0.09)
-- Advisory Only	60.86 (13.33)	1.04 (0.73)	3.23 (2.15)	0.02 (0.12)	20.26 (3.33)	-0.26 (0.19)
Elected Members on Board	-20.97 (24.86)	-0.47 (0.65)	-1.20 (3.98)	-0.82 (0.17)	-5.32 (3.85)	1.70 (0.19)
# Internal Members on Board	1.03 (1.23)		0.35 (0.20)		-0.20 (0.33)	
1 internal member		0.27 (0.45)		0.14 (0.10)		0.22 (0.16)
>1 internal member		-0.23 (0.43)		-0.03 (0.07)		-0.20 (0.12)
Institutional Level Board						
# of Boards Within State	2.69 (1.41)		0.58 (0.21)		-0.99 (0.37)	
Single Board		1.15 (1.14)		-0.19 (0.27)		-0.04 (0.30)
2-5 Boards		-1.53 (1.63)		-2.44 (0.65)		0.15 (0.55)
>5 Boards		-0.12 (1.76)		-2.24 (0.66)		0.47 (0.55)
Multi-campus Board	15.08 (26.38)	3.81 (1.46)	13.07 (3.09)	2.78 (0.49)	-3.48 (6.37)	0.82 (0.42)
-->60% Appointed by Governor	-58.60 (18.55)	-3.10 (1.06)	-5.73 (2.58)	-0.70 (0.17)	-12.67 (4.73)	-0.68 (0.19)
Single Campus Board	-57.35 (36.02)	-0.72 (2.24)	<i>10.15</i> (5.41)	2.01 (0.61)	8.10 (8.37)	2.05 (0.50)
-->60% Appointed by Governor	14.41 (23.49)	1.73 (1.50)	-2.55 (4.06)	0.01 (0.31)	-19.11 (5.55)	-1.96 (0.26)
Elected Members on Board	<i>50.96</i> (28.67)	2.24 (2.05)	13.34 (4.73)	0.33 (0.44)	<i>10.16</i> (5.34)	-0.28 (0.30)
# Internal Members on Board	-3.25 (3.22)		-0.54 (0.56)		1.26 (0.92)	
1 internal member		-0.10 (0.69)		0.04 (0.11)		-0.87 (0.17)
>1 internal member		-1.64 (0.61)		-0.17 (0.11)		-0.32 (0.16)
Research/Doctoral Institution	100.17 (5.99)	2.96 (0.39)	14.58 (0.80)	0.88 (0.09)	30.88 (1.75)	0.10 (0.13)
Medical School on Campus	352.70 (16.98)	15.44 (1.18)	26.43 (2.12)	1.52 (0.19)	62.09 (4.29)	-0.08 (0.28)
Year Trend	2.79 (1.17)	4.43 (1.31)	2.00 (0.16)	3.44 (0.39)	-1.73 (0.33)	-3.78 (0.40)
Fixed Effects	Region	University	Region	University	Region	University
R-Square	0.6548	0.9923	0.666	0.9839	0.7004	0.9905
Number of Observations	4081	4081	4141	4141	4125	4125

Note: All regressions include state level political, economic and demographic measures. Coefficients in bold are significant at p<.05; coefficients in italics are significant at p<.10. Standard errors are reported in parentheses.

Table 5: Summary of Regression Results for All Resource and Productivity Measures
Part A: State Level Governing Board

Resource		State Level Board			
		Decentralized (1a)	>60% Gov Apptd (1b)	Elected Members (1c)	Internal Members (1d)
Total Revenues		+, +	-, 0	0, 0	0, 0
Tuition Revenue		+, +	+, -	0, -	0, 0
State Appropriations		+, +	-, +	+, 0	0, 0
Total Expenditures		+, +	0, 0	0, 0	+, 0
Tuition Rates	In State	+, +	+, -	+, -	+, 0
	Out of State	+, +	-, -	-, -	+, -
Enrollment	Undergraduate	+, +	-, -	0, +	0, 0
	Graduate	+, 0	+, 0 for Gov Bd; -, 0 for Coord	0, 0	-, -
Faculty		+, -	-, 0 for Gov Bd; ++ w/Coord	0, +	0, 0
Faculty Salary		0, ?	-, +	0, +	0, 0
Endowment		+, +	-, -	0, 0	+, -
Total Donations		+, +	-, -	0, 0	0, 0
Alumni Donations		0, 0	0, 0	0, -	0, 0
Total Research		0, +	0, 0 for Gov Bd; 0, - for Coord	0, 0	0, 0
Federal Research		+, +	0, 0 for Gov Bd; 0,- for Coord	0, 0	0, +
State Research		?, ?	0, 0 for Gov Bd; +, 0 for Coord	0, 0	-, -
Articles Published		+, +	0, 0	0, 0	0, 0
Citations Per Article		+, +	0, + for Gov Bd; -, + for Coord	-, +	0, 0

A “+” sign indicates that the control increases the resources to the university, a “-“ sign indicates the control decreases the resources to the university, a “0” indicates the coefficient on the control is not significantly different from zero, and a “?” indicates the relationship is unclear.

Part B: Institutional Level Measures

Resource	University Level Board # of Boards	Multi-Campus Boards v. No Board	Single Campus Board				Elected Members	Internal Members
			>60% Gov Apptd (2b2)	v. no Board (2c1)	v. Multi- Campus (2c2)	>60% Gov Apptd (2c3)		
	(2a)	(2b1)	(2b2)	(2c1)	(2c2)	(2c3)	(2d)	(2e)
Total Revenues	0, 0	0, +	-, -	0, 0	-, -	0, 0	+, 0	0, -
Tuition Revenue	+, -	+, +	-, -	+, +	0, 0	0, 0	+, 0	0, 0
State Appropriations	-, -	0, +	-, -	0, +	0, +	-, -	+, 0	0, -
Total Expenditures	+, -	-, 0	+, 0	-, 0	-, 0	0, 0	+, +	0, -
Tuition Rates								
	In State	+, +	+, 0	-, -	+, 0	0, 0	0, +	0, -
	Out of State	+, 0	+, +	-, -	-, 0	-, 0	+, +	+, -
Enrollment	Undergraduate	+, -	-, +	0, 0	0, 0	?, ?	-, +	+, 0
	Graduate	0, -	+, +	-, -	0, 0	?, ?	-, +	+, +
Faculty		-, 0	0, 0	-, -	+, 0	+, 0	-, 0	+, +
Faculty Salary		+, 0	-, +	-, -	-, +	-, 0	0, +	0, -
Endowment		+, +	0, 0	-, -	-, -	-, -	+, 0	0, 0
Total Donations		-, 0	+, +	-*	0, -	?, ?	0, +	0, +
Alumni Donations		+, +	0, 0	-, -	-, -	-, -	+, 0	+, +
Total Research		0, +	+, -	-, -	0, -	-, -	-, 0	+, +
Federal Research		+, +	+, -	-, -	0, -	-, -	0, 0	0, 0
State Research		-, -	-, 0	0, +	+, 0	+, 0	-, 0	0, +
Articles Published		0, +	+, -	-, -	0, -	-, -	-, 0	+, +
Citations Per Article		+, -	0, 0	0, 0	-, +	-, +	+, 0	+, -

A “+” sign indicates that the control increases the resources to the university, a “-“ sign indicates the control decreases the resources to the university, a “0” indicates the coefficient on the control is not significantly different from zero, and a “?” indicates the relationship is unclear.