The Center

University Organization, Governance, and Competitiveness

John V. Lombardi
Diane D. Craig
Elizabeth D. Capaldi
Denise S. Gater

August 2002

The Top American Research Universities
An Annual Report from
The Lombardi Program on Measuring University Performance

Contents

Acknowledgments

The authors gratefully acknowledge the support of Mr. Lewis M. Schott, whose generous contribution established the Lombardi Program on Measuring University Perfomance.

University Governance and Organization

Research universities live in complex contexts, compete in many different marketplaces, and perform a bewildering array of highly sophisticated services for many diverse constituencies. Although research universities focus their efforts primarily on the key dimensions of teaching and research, they engage in a wide range of additional activities derived from the expertise and resources accumulated in support of teaching and research. With the dramatic expansion of higher education, and particularly public higher education, in the post World War II years and then again in the 1960s, institutions became much more complex and the organization of their governance became an evermore popular topic, especially among political leadership in the various states. Public university governance and organization, a topic for scholarly interest since the pre-war years of the 1930s, became a major concern in most states throughout the last half of the twentieth century and continues to preoccupy institutions, their governance boards, and their political supporters into the early years of this century.

Definitions

In the discussion of university governance and organization, as is often the case with other university-related topics, we immediately encounter a series of ambiguous terms. American universities have a remarkably imprecise vocabulary to describe their activities. Take the word "university." While everyone agrees this refers to an institution of post-secondary education, the range of such institutions that use this term is large. Small private and public institutions with modest to almost invisible graduate programs and a narrow range of disciplines as well as major research universities with extensive graduate and professional programs and an extended array of disciplines all carry the same name: University.

Further complicating the nomenclature, we have the terms "school" and "college." Sometimes context makes the definition clear: "The engineering college prospered." In other situations, context is ambiguous: "My daughter visited five colleges before deciding on Stanford." We do not know from this statement whether the daughter visited Oberlin, Pomona, Smith, Amherst, and Stanford or visited Michigan, Berkeley, Minnesota, Illinois, and Stanford before choosing Stanford. "College," like "university," refers not only to institutions large and small – all of which offer undergraduate degrees from the AA to the BA or BS but also to subdivisions of the university like journalism or business. "School" is equally ambiguous. While almost no one, in formal contexts, refers to a college or university as a "school," students frequently use the word "school" to refer to their university. "What do you think of the school so far?" the junior will ask the freshman at a university event. "We have great school spirit among the students," says another. In this context, clearly "school" is equivalent to the institution – whether university or college – even though in organizational terms universities use the name "college" or "school" for academic subdivisions.

The academic meaning of these terms also varies from institution to institution. Some have only schools (medicine, engineering, music) such as Johns Hopkins. Some have only colleges of medicine, engineering, or fine arts. In some institutions, the school distinction is reserved for the non-arts and sciences units, and arts and sciences units carry the title of college (Indiana University Bloomington). Finally, in some institutions a college is a larger academic administrative unit under which schools may exist (a college of fine arts with its school of music and school of art).

American universities have a remarkably imprecise vocabulary to describe their activities.

Equal variety attends the designation of campus officers above the level of dean. Presidents, chancellors, provosts, executive vice presidents, deputy chancellors, and other titles serve purposes of significance to local participants in the institutional culture. In some institutional settings the president presides over the system and chancellors preside over the individual institutions; in others the chancellor serves the system as chief executive and the presidents serve the universities. Most private universities have presidents as chief executive officers, but some have chancellors. Second-order administrators take the title from their superiors; so vice presidents serve presidents, and vice chancellors serve chancellors. When institutions and their systems become complex, universities identify intermediaries in their hierarchies and titles such as provost or deputy chancellor or executive vice president appear with responsibilities greater than a vice president or vice chancellor but less than a president or chancellor.

The title of provost confuses those outside the academic environment, and most provosts carry the additional title of vice president for academic affairs. If the message that the title "provost" makes a vice president first among vice presidents is insufficient, some acquire the additional honorific of senior vice president for academic affairs to add weight to the title of provost. In some places, where the administrative functions of finance and business operations hold great institutional significance, such an officer may also be a senior vice president, although whether that trumps a provost or executive vice president is mostly a function of institutional tradition.

A "campus" is an important concept in most universities. The campus defines geography, a location that in some original sense represented the institution. When colleges and universities were small and self-contained, the notion of college and campus coincided. With the advent of large single institutions, remote branch locations, and multiple-institution university systems, the precision of the concept of campus coinciding with university blurred. Many large universities have separate campuses in the same city, sometimes physically connected sometimes not. University at Buffalo, for example, has two campuses separated by three miles. Even when the physical space of the university is contiguous, such as the University of Michigan at Ann Arbor, people speak of the medical campus, the north campus, the south campus, and the central campus. The archetypical small college remains, however, embedded in our imaginations. Many observers still use the term "campus" to refer to a university that may have two or more distinguishable physical locations where it delivers its programs.

If the definitions used for single institutions are difficult, imagine the naming challenge for systems, groupings of institutions in the complex governance organizations discussed here. Although, for various political and administrative reasons, systems of institutions choose different naming conventions, we treat all of them as systems. Sometimes, as is the case of the University of California and other similarly constituted systems, the rhetorical language implies one university existing in many different locations. This concept has some validity related to the formal authority of the system, but in practice individual campus-based institutions within the system function in ways that mimic single campus research universities. The key participants for research universities – faculty and students – live and work primarily in one place and their academic lives and accomplishments revolve around mostly place-bound resources and activities.

In research university contexts, the campus location also identifies the universe of individuals who participate in decisions about the quality of research and the content of the teaching program. Recruitment of faculty and students and promotion and tenure decisions about faculty usually reflect primarily place-specific criteria, even when the system is styled as a single university with multiple campuses. Students and faculty make choices related to campus location, not system designation. In California or Massachusetts, a student or faculty member affiliates with Berkeley or UMass Amherst, not with the University of California or the University of Massachusetts writ large, even though systems have their own characteristics that may enhance or detract from the desirability of campuses. Some university systems seek to present themselves as a single university with multiple locations as a way to show the system's assets as a single large resource rather than as the disaggregated and less impressive subtotals of the individual campuses. Some systems also promote the notion of a single university for statewide political purposes or in marketing their programs internationally.

Another distinction involves the branch campus. While university systems may coordinate or govern multiple university campuses with relatively autonomous academic decision-making authority, many individual institutions (standing alone or within systems) also have branch campuses. Branch campuses generally depend heavily on the parent campus for academic direction, usually do not have autonomous academic personnel decision-making authority for promotion and tenure, and often provide only a subset of the full curriculum offered by the parent.

In our work here and for the purposes of understanding research universities, we use the term "university" to apply to a single campus-based institution that has substantially independent academic decision-making authority and admits students primarily with reference to local standards. These campuses hire, promote, and tenure faculty through processes that substantially rely on locally referenced campus standards and usually have tenure defined by specific campus location. We use the term "system" to apply to governance organizations of many types that collect these university campuses into organizational and managerial constructs of greater or lesser complexity and integration. Systems rarely combine campus-based research institutions into a single functioning university entity although a few systems share some academic units across several institutions.

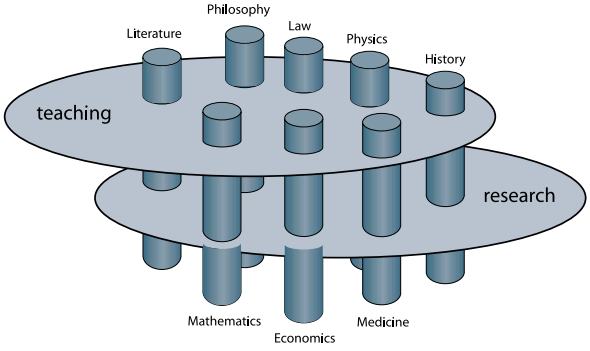
For our purposes, we use the terms "institution" and "university" interchangeably to refer to the campus-based research universities that have been the focus of these annual reports on *The Top American Research Universities*, and we refer to the larger organizations that in the public sector govern groups of universities (however named or organized as described below) as "systems." For example, the University of California is formally one university with multiple campuses. But for the purposes of our discussion, we see the University of California as a system that governs multiple campus-based research universities such as UCLA or Berkeley. The goal of these reports, of course, is to understand the competitive success of individual research universities, and in this report we look at the complex organizational models within which they operate.

Quality Engines

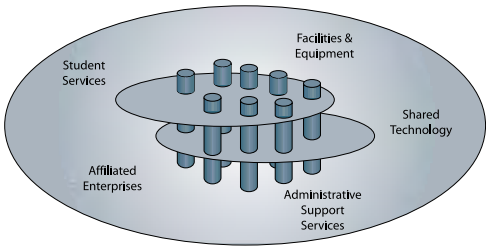
As we discussed in our previous publication (*The Top American Research Universities, 2001*), research universities function as quality engines. They accumulate resources of all kinds to support the highest possible levels of faculty and student quality. Faculty and students, pursuing their individual goals within the context of the university's academic programs and guilds, develop their skills and use them to create additional value either in the form of enhanced capabilities as graduates (at all levels from undergraduate through professional school to the PhD) or of contributions to new knowledge through research.

In achieving these aims, the quality engine of the American research university operates multiple separate domains, nonetheless connected within the boundaries of the campus-based institution itself. One domain drives the teaching enterprise at the undergraduate level; another connects graduate and professional studies to the work of the faculty. A third sustains the research of the faculty and their many collaborators, while a fourth translates those research accomplishments into patents, licenses, and other assets of value to the nation and the world. The core of this engine, which we described more fully in last year's report, is composed of departments or programs that resemble guilds – defined as organized collections of individual experts joined by their shared commitment to a particular methodological and subject approach to knowledge and driven by a national and international system of common standards and criteria for quality. These guilds – whether familiar ones like history, English, chemistry, psychology, philosophy, physics, and mathematics or newer ones like neuroscience or biomedical engineering – control faculty identification, selection, promotion, and tenure. Through this process, the guilds function as self-perpetuating communities whose quality depends on the rigor of the standards they apply to those who would become permanent members.

In the academic core, the faculty guilds control teaching and research quality



The guilds and their work are at the nucleus of a broader university environment…



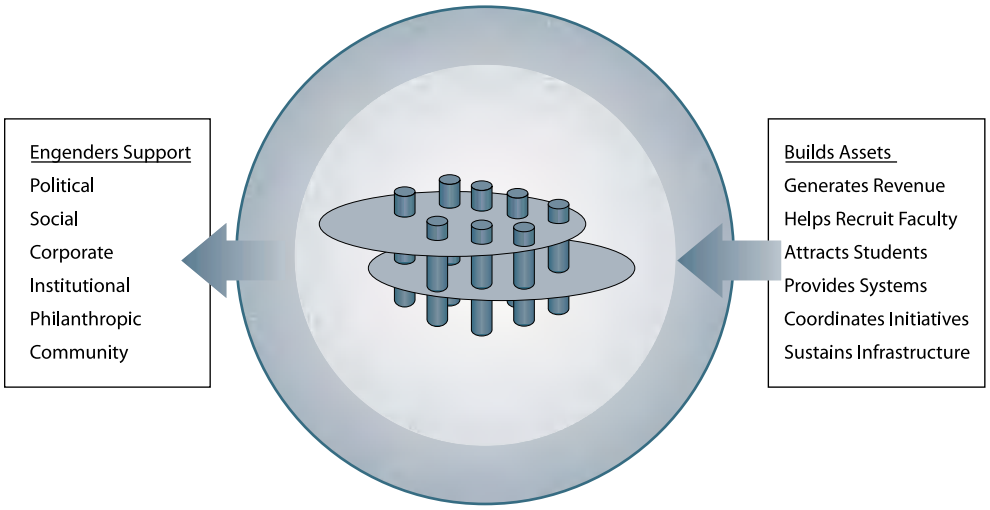
an environment that is enriched with student services, general support and enterprises complementary to research and teaching

University Administrative Shell

Although the guilds hold the keys to the effectiveness of the American research university's quality engine, they rarely exist independently of the support and management provided by the university shell. The shell, also described more fully in last year's report, serves as the organizational construct that acquires money and other resources needed by the guilds. It provides the administrative infrastructure that supports the guilds and their work, creates the connective mechanisms that link the guilds for the purposes of undergraduate education and other joint enterprises, and protects the guilds and their members from external pressures that might impair their effectiveness.

The public sees the shell as the administration of the university with its boards and administrative offi-

An active administrative "shell" positions the institution as a whole, builds resources and helps to attract faculty, students and benefactors



cers and its hierarchically represented organizational structure. The guilds know that this hierarchy belongs primarily to the shell and does not define the authority structure of quality engine's academic core. While shell agents can manage money and resources, they do not directly control the content or quality of the institution's academic work, which belongs to and is primarily supervised and managed by the faculty. The faculty, in turn, define academic standards in cooperation and collaboration with colleagues in similar guilds throughout the nation.

Nonetheless, the work within the shell is essential to the success of the quality engine's guilds. Everything the guilds seek in the pursuit of quality requires support: faculty, students, libraries, laboratories, computers, buildings, travel, research assistance, and the like. All of these elements need money. The defining function of the shell is to acquire the maximum resources possible in support of the guilds' missions of teaching and research. Teaching and research do not directly command a sufficient share of resources in the open marketplace to pay the full cost of their production, and shell agents work endlessly to identify additional sources of funding. This involves development or fund-raising), political lobbying for additional state and federal support, encouragement of grant and contract application and awards to expand the research base, development of commercial or quasi-commercial businesses derived from the university's intellectual property, and the efficient and effective operation of the institution and its various affiliated enterprises.

Our interest, we must emphasize, focuses on only one segment of the American higher education marketplace: major research universities defined as institutions with at least $20 million of federally funded research expenditures per year. This group of about 160 institutions controls over 90% of all the federally funded research expenditures reported by the 600 institutions that share this support. They compete fiercely for the funds that make this research possible; for the services of the most productive, creative, and innovative research faculty; and for the resources to recruit the best undergraduate, graduate, and professional students into their midst. This competition drives the behavior of America's research universities, and our work over the past few years has attempted to understand this competition. We have described the characteristics, and we present various indicators of institutional success in the competition. We have explored the impact of size and medical schools on the competition, for example, and we have looked closely at the mechanisms by which these quality engines support and improve quality.

As we continue to explore this competitive behavior, the wide range of organizational and governance structures within which American research universities function intrigues us. We examined the extensive literature on the organization and governance of public and private universities and reviewed the many forms of governance to discover how the organizational structures of institutional governance influence research university competition.

Governance Prototypes

The variety of organizational structures that govern American research universities ranges from a simple model that places a university campus in a single, not-for-profit corporation responsible to a self-perpetuating

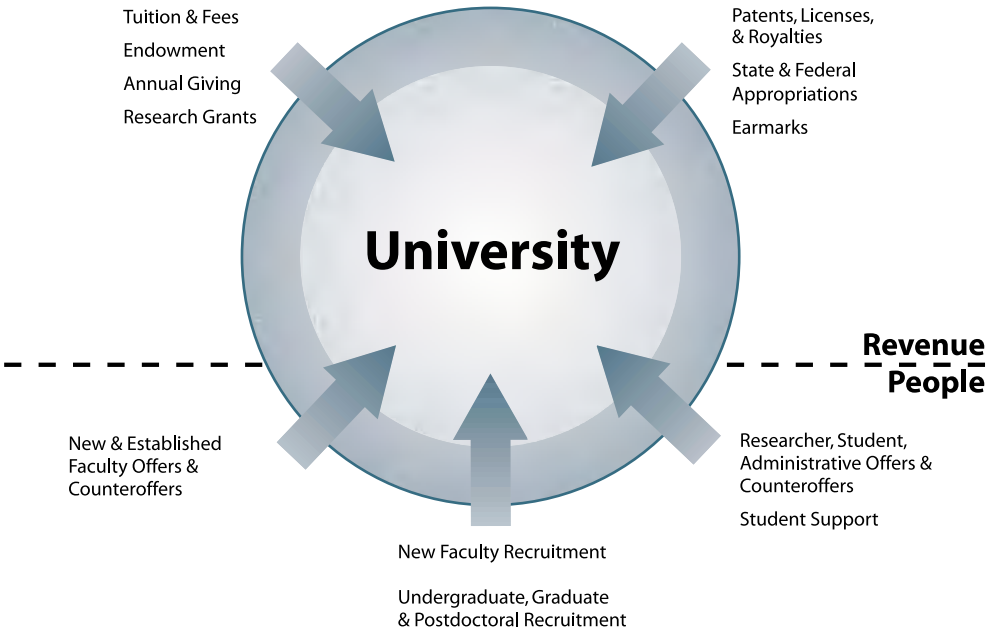
board of trustees to the ornate configurations of state university systems with their overlapping boards of regents and trustees, their higher education coordinating commissions, and their multiple subsidiary foundations and other enterprises. Despite this range of governance, research university quality engines – with their immediate shell and core academic guilds – compete with each other in almost identical ways. Governance structures take on forms that adapt to the challenges of external environments rather than respond primarily to the needs of the academic guilds they govern. Among private institutions, governance models change little over the period of a century or more. For many public institutions, however, governance mechanisms that link the institution to the state that sponsors and owns them often change – sometimes dramatically.

In our review of organizational models, we identified a number of prototypes, drawing on the extensive literature on this topic, which we review briefly below. These models represent a simplification of the detailed formal, organizational structure of institutions and systems as reflected in their documents, and our own involvement with a number of institutions clearly indicates that behavior and the balance of authority and responsibility can vary considerably from what the documents imply. Our prototypes represent a stylized version of the 19 different structures identified by the Education Commission of the States, in part because we look at organization from the perspective of the research university rather than from the perspective of the state or corporation that governs the institutions.

Universities generally fall into three main groups containing a number of sub-categories:

- The first group includes those universities that have a single governing board for a campus-based research institution with direct authority and responsibility for the operation and management of the institution. Some institutions in this group, primarily private, have self-perpetuating governing boards with complete authority and responsibility for all aspects of the university's operation. Others, primarily public, have mostly politically appointed governing boards with an obligation to report to legislatures, governors, or statewide boards or commissions that may limit the institutional board's authority and responsibility in various ways.
- The second group includes multiple campus-based public institutions governed by a common statewide board. In this group, the campus-based institutions may report to the statewide board directly or through a system executive.
- The third group of public institutions has a local governing board for the campus institution, and this local board has a subset of powers derived from or delegated by a statewide board. The dis-

A competitive university must continually fuel its quality engine with people, capacity and resources



tribution of authority and responsibility between the statewide board and the local board, and between state-level executives and campus-level executives, varies widely. These relationships tend to change with some frequency in response to challenges, opportunities, personal ambitions of individual actors, and legislative and executive branch preferences.

When a university has a single board for a single campus, the relationships of authority and responsibility appear much more clearly than in the other types discussed here. Particularly in private institutions, the single-institution board has authority and responsibility for everything the university does, and it delegates responsibility and authority to various university officers, usually through the president or chancellor for the actual operation of the institution. These boards usually have complete fiduciary responsibility for the institution and exercise close supervision over financial and budget matters. At the same time, these boards differ substantially in the delegation of authority within the university. In some instances, they expect the president or chancellor to retain most of the authority and responsibility in the central administration. In other cases, they expect the campus chief executive to delegate that authority and responsibility to vice presidents, deans, and other university officers, while retaining the supervisory role of ensuring effective operation and managing and promoting institution-wide objectives such as fundraising.

The majority of public research universities operate within systems where several largely independently administered university campuses share the same board or multiple boards and commissions.

Very few public universities have this kind of clear relationship between the governing board and institutional management. Even when a public university has one board for a single campus institution, the politically selected board usually shares responsibility and authority, especially in financial and budgetary matters, with state-level bureaucracies, either in the form of higher education commissions or boards of education. Often, these higher-level organizations serve not as governing entities in relationship to the university's board but as legislative or executive branch extensions to deal with fiscal policy and coordinate issues related to the state's support of higher education. While it is not always possible to make clear distinctions, many state-level organizations perform both functions and some are more intrusive than others in the operation of the university's board.

Public and private research universities with one governing board for a single institution may also have branch campuses. Although the dividing line that separates multi-campus institutions from single-campus institutions with branch campuses is none too clear, we think the distinction is worth making. When a university has branches that simply extend the university's activities into other geographic locations, and the activities in these locations do not have independent academic personnel or curricular authority, then we consider them branch campuses and include the institution within the single-institution, single-board category. Historically, some single-campus, single-board institutions created branch campuses that later on acquired sufficient academic size and complexity to warrant more or less independence in their academic governance and operations. Usually in these cases, the defining distinction involves local campus control over promotion and tenure and often includes independent accreditation. In such instances, the single-campus, single-board institution becomes a multi-campus, single-board institution.

The majority of public research universities operate within systems where several largely independently administered university campuses share the same board or multiple boards and commissions. Although the variety of structures and arrangements is impressive, most of these reflect two formative processes:

- Consolidated systems usually emerge through the growth of branch campuses of a single university into a multiple-campus university system. Often distinguishable from multi-campus, single-board types, these consolidated systems have a system-level CEO and individual university CEOs but a governing board only for the system.
- Coordinated systems result from a process that collects previously independent institutions into a structure governed by a single board. Typically, each institution has its own CEO, and these institutions do not manage multiple campuses. Often the coordinating board will oversee all state institutions of higher education including community and other two-year colleges.

Although the origin of each of these types is of some interest, the levels of coordination and control exercised over the research institutions vary greatly within each of these types and the distribution of

authority and responsibility changes over time. In both types, research campuses generally function in similar ways, as we discuss below.

These multi-university systems themselves often belong to other governance structures, either reporting to a board of education or involved with coordinating agencies of every imaginable type. The powers and authority of these commissions and boards of education that exist outside the direct governance boards for the universities range from direct supervisory authority through coordinating authority to advisory functions.

The following diagram illustrates the distribution of a group of universities defined by the criteria used for this publication's *Top American Research Universities*. Note that all private universities fall into the first group of institutions with a single board for a single university. We divided the governance structures that apply to public research universities into three major categories (recognizing that this is a simplification of the full complexity of state system structures). The first group includes research universities that have single governing boards for each research university. Most of the universities in this group are in systems that have some form of statewide coordination, and some of the universities included here have branch campuses or medical branch campuses.

The second group of universities has local boards for each university with powers derived from a single governing board. Most of the local boards have the authority to identify a campus chief executive and recommend the appointment to the governing board. These institutions usually have some form of statewide coordinating board or commission.

The third and largest group of public universities reports to a single governing board along with other research universities. They have no local boards, although the systems of which they are a part usually work with a statewide coordinating board or commission. This group is large – in part because of the number of University of California institutions that qualify in the top category of research universities.

This focus on public research universities should not obscure the fundamental distinction between public and private governance. In private universities, the single board not only focuses exclusively on the success of an individual university but also usually sees its role as supporting rather than controlling the institution. Public university boards, politically appointed or elected in most cases, usually serve to regulate the university on behalf of public constituencies. This fundamental difference in orientation and focus is the primary difference between public and private university governance.

Political Context

Every state university, however it appears in a governance system taxonomy, is subject to the policy control of the state legislature and often to the policy objectives of the state's executive branch. Legislatures can and do provide direct guidance on academic matters to state institutions, often overriding the presumed authority of institutional boards. Depending on the traditions and legal basis of the university's charter (whether included within the state's constitution or created by legislative act), the form of this intervention may vary, but the state's strength in higher education issues comes in large measure from the power to appropriate funds. When legal and administrative traditions place the university directly in the legislative process, this authority over academic matters can appear in explicit legislation specifying program content, graduation standards, and even detailed curricular matters.

Private university boards see their role as supporting their institutions; public university boards usually serve to regulate their universities on behalf of public constituencies.

When legal traditions place the university outside of the direct legislative process, because the university is an artifact of the state constitution and not a creature of the legislature, the authority over academic issues may appear indirectly. The legislature can withhold appropriations until the university implements a desired goal or appropriates dollars restricted to a specific purpose or guided by a legislatively approved master plan. The multiple coordinating agencies that characterize many state higher education governance structures also serve to extend the legislature or governor's influence over the operation of university programs.

These considerations about legislative and executive branch intervention apply to all of the governing structures discussed here. Even private universities find themselves engaged in this conversation. Many states have coordinating commissions or other bureaucratic entities whose mandate includes some responsibility for rationalizing the educational delivery process of higher education, including not only public but also private, not-for-profit, and for-profit institutions. Laws in many states require all higher education institutions to receive permission from the

Governance Structures

The Top American Research Universities

Private and Public Institutions with More Than $20 Million in Federal Research

Single Governing Board – Single Research University

University may have branch campuses. Most Public universities have state-wide coordinating boards.
Private universities may have a formal or informal relationship with a state-wide coordinating agency.

Boston University
Brandeis University
Brown University
California Institute of Technology
Carnegie Mellon University
Case Western Reserve University
Charles R. Drew University of Medicine and Science
Columbia University
Cornell University
Dartmouth University
Duke University
Emory University
George Washington University
Georgetown University
Harvard University
Howard University
Johns Hopkins University
Massachusetts Institute of Technology
Michigan State University
New Jersey Institute of Technology
New York University
Northeastern University
Ohio State University - Columbus
Princeton University
Rensselaer Polytechnic Institute
Rice University
Rockefeller University
Rush University
Rutgers the State University of NJ - New Brunswick
Saint Louis University - St. Louis
Stanford University
Syracuse University
Tufts University
Tulane University
University of Alaska - Fairbanks
University of Chicago
University of Cincinnati - Cincinnati
University of Dayton
University of Delaware
University of Kentucky
University of Miami
University of Michigan - Ann Arbor
University of Notre Dame
University of Pennsylvania
University of Rochester
University of Southern California
University of Vermont
University of Virginia
University of Washington - Seattle
Vanderbilt University
Virginia Commonwealth University
Virginia Polytechnic Institute and State University
Wake Forest University
Washington State University - Pullman
Washington University
Wayne State University
Woods Hole Oceanographic Institution
Yale University
Yeshiva University

Single Governing Board – Multiple Institutions with Local Trustee Boards

Local Boards have delegated powers or legislatively defined powers.
Most local boards recommend institution CEO. Most have state-wide coordinating boards.

Auburn University - Auburn
Clemson University
Florida A&M University
Florida State University
North Carolina State University
Pennsylvania State University - University Park
University at Albany
University at Buffalo
University at Stony Brook
University of Florida
University of North Carolina - Chapel Hill
University of Pittsburgh - Pittsburgh
University South Carolina - Columbia
University of South Florida
University of Utah
Utah State University

Single Governing Board – Multiple Institutions with No Local Board

Most have state-wide coordinating boards.

Arizona State University - Tempe
Colorado State University
Georgia Institute of Technology
Indiana University - Bloomington
Indiana University - Purdue University Indianapolis
Iowa State University
Kansas State University
Louisiana State University - Baton Rouge
Mississippi State University
Montana State University - Bozeman
New Mexico State University - Las Cruces
Oklahoma State University - Stillwater
Oregon State University
Purdue University - West Lafayette
Temple University
Texas A&M University
University of Alabama - Birmingham
University of Alabama - Huntsville
University of Arizona
University of California - Berkeley
University of California - Davis
University of California - Irvine
University of California - Los Angeles
University of California - San Diego
University of California - Santa Barbara
University of California - Santa Cruz
University of Colorado - Boulder
University of Connecticut - Storrs
University of Georgia
University of Hawaii - Manoa
University of Houston - University Park
University of Idaho
University of Illinois - Chicago
University of Illinois - Urbana-Champaign
University of Iowa
University of Kansas - Lawrence
University of Maryland - College Park
University of Massachusetts - Amherst
University of of Minnesota - Twin Cities
University of Missouri - Columbia
University of Nebraska - Lincoln
University of Nevada - Reno
University of New Hampshire - Durham
University of of New Mexico - Albuquerque
University of Oklahoma - Norman
University of Oregon
University of Puerto Rico - Mayaguez
University of Rhode Island - Kingston
University of Tennessee - Knoxville
University of Texas - Austin
University of Wisconsin - Madison
West Virginia University

state before offering educational services. States have tuition support programs that give modest but significant financial grants to private institutions for enrolled in-state students. The provision of this funding carries with it the opportunity for the state to assert some influence over the academic behavior of private institutions. This influence is less directive and less comprehensive than the relationship between the state and its public institutions, but nonetheless makes the state's higher education policy goals relevant to private institutions.

Politics is a source of most public university existence. The state, on behalf of the people, creates the institutions, provides significant portions of revenue, and regulates institutional behavior. State systems of governance and coordination act as agents of the state's political authority and regulate, direct, and control universities in response to the political process. This power flows clearly and directly from public ownership of the state university, and the trustees (regents, board of education members) have an obligation to manage the institutions on behalf of the people as directed by state officials.

Some of this may seem obvious, but it deserves emphasis because it is in this role that public university or university system trustees differ most significantly from their private university counterparts. The private university board owns the university directly and answers to the public primarily in terms of its fiduciary responsibility. The private university board focuses almost exclusively on the effort to fund and enhance university performance as defined by the board and the institution. It works on behalf of the institution, not on behalf of outside political constituencies. While the private board may take social needs, public obligations, and alumni and citizen concerns into consideration, it does not have a formal and direct obligation to direct the university to meet these concerns. The private board aligns its efforts with the interests of the institution it supervises. Indeed, one of the primary considerations for membership on a private university board is a commitment to the university's mission, frequently expressed through substantial philanthropy. This difference in perspective explains why public university presidents, chancellors, chief financial officers, and other top executives often feel as if they have arrived in heaven when they move from managing a public institution to managing a private institution.

The political imperatives for public university governance appear clearly to many political and bureaucratic leaders within the various states, and the members of these boards gain their posts usually by political means. Nonetheless, universities themselves are political entities that can and do act independently in their own self-interest. Public universities have alumni and local and regional support groups. They serve many constituencies of high political value in their states. Public research universities have multiple sources of revenue in addition to state dollars, and most universities of any distinction provide the state with services funded from these non-state resources. Whether in teaching, research, economic development, or various forms of service, the research university generates a substantial proportion of the revenue it spends. As a result, states simply cannot dispose of universities as political imperatives of the moment might indicate.

Public universities themselves are political entities that can and do act independently in their self-interest through alumni and local and regional support groups.

If a proposed political change appears dangerous to the university, the institution will mobilize its forces to resist that change even when its politically appointed governance system may not concur. Often the university is remarkably successful in defeating the substance, if not necessarily the form, of political intervention.

In this political context, the governance system finds itself in a conflict. While in theory the trustees, boards, or other direct governance organizations serve the state and are responsible to the state for the operation of the universities, they also often assume the values and aspirations of the research institutions they regulate. A public board enhances its identification with the institution's objectives when it supervises only one institution. Political agenda are more significant when the board supervises multiple institutions. The governor may appoint the trustees, for example, but if the governor's agenda appears to threaten the universities' aspirations, and if the universities and their alumni can make this case persuasively, these politically appointed boards may resist the changes identified as essential by the legislature, governor, or state bureaucracy. In this intermediary role, the trustees or other public governance systems may find themselves sometimes on the side of enforcing the expectations of elected and appointed state officials and, at other times, on the side of resisting these expectations. On occasion, the governance system's lack of responsiveness to the state political agenda will lead to a reorganization of higher education in order to impose the state's will more effectively.

This kind of reorganization falls into two categories. States can impose a higher level of control on existing institutional governance structures by creating higher education coordinating, budgetary, or policy commissions, or by redistributing power and authority among the various levels of the state higher education governance system. These interpose a filtering bureaucracy responsible to legislatures or governors that reduces the effectiveness of institutions and their governing boards in taking institutional agenda directly to the political process. Coordinating commissions vary in their effectiveness depending on the powers awarded them by the legislature or governor and on their ability to impose their determinations over the aspirations of the governing boards of the individual institutions or groups of institutions in the state. If the legislature and governor permit the institutional or system boards to carry their agenda directly to the political process and fail to assert the authority of the coordinating board, commission, or agency, then the coordinating unit will become just another bureaucratic but mostly ineffective voice in the crowd.

When coordinating mechanisms for aligning public universities with current political objectives fail, states often change the organization of the higher education system.

When coordinating commissions and other mechanisms for aligning the institutions with a state's current political objectives fail to perform adequately, states may change the organization of the state higher education system either completely or substantially. They can consolidate institutions into a single system or multiple systems with direct controlling bureaucracies headed by politically appointed chief executives or boards. They can impose a high-level board with the authority to control the lower-level governance boards for the individual institutions or groups of institutions, and they can put particular educational objectives into law.

While these changes sometimes respond to perceived or real problems of effectiveness and efficiency in the higher education system, at other times they respond to the needs of the political actors who seek innovation and change as part of a wider state agenda. Of particular interest in this conversation is the role of technocratic elites at various levels of the public higher education system in most states. The technocrats often staff legislative committees concerned with the funding and operation of higher education, serve in the governor's or other executive branch offices that deal with educational budget issues, and serve on the staffs of coordinating commissions.

Such individuals have considerable expertise about university funding, curricular trends, student access, and other matters essential to the successful delivery of higher education to the people of the state. Often they have strong personal opinions about how universities should operate. Although they are not part of the direct institutional governance through its administrative shell, they nonetheless have significant influence because they control the details of the political processes at different levels above the quality engine and often become key actors in determining and implementing state policies that affect public research universities. The technocrats sometimes support the aspirations of research universities, but often their values lead them to prefer to support large-scale generic undergraduate education. The effort of managing this particular set of technocratic actors constitutes one of the important tasks of the staff of individual university shell organizations.

In every state – whatever the formal organization of higher education governance – the political culture and, in particular, the location of power within state government determine how the system functions. If power is concentrated in the hands of the governor, then the governor will drive state higher education policy and funding. If power resides in the hands of long-term legislative leadership, then legislators will drive higher education. If state government shares or disperses power widely within its agencies and term limits diminish the power of legislative leadership, then technocratic staff and multiple-party negotiations may characterize higher education governance. No formal statement of organizational structure adequately captures public higher education governance without a parallel understanding of how the formal structure relates to the actual distribution of political power within state government.

Purpose and Functions of Governance

Practically every state develops a strategic vision for its higher education system, whether expressed in the form of a master plan or a mission statement. The relevance of these strategic perspectives to state funding and system organization varies greatly, and many strategic plans remain as statements of intent rather than directives for action. A much more commonly pursued goal of statewide coordination of higher education is to restrain costs and reduce program duplication to a minimum. Captivated by the organizational notions current in American business, where consoli-

dation, efficiency, and economies of scale appear ascendant, state legislators and governors hope to achieve similar results by imposing large-scale organizational models on the rapidly proliferating campuses dependent on state funding. While each state develops a pattern for distributing authority and responsibility for higher education to the various components of its higher education governance system, some common elements appear in every state.

Money underlies much of this conversation. States recognize the rapidly increasing cost of higher education resulting from the growing percentage of their population attending college after World War II, and especially after 1960, accompanied by an increase in the complexity and sophistication of public higher education institutions. Much of the coordination and governance effort focuses on controlling and managing costs. Legislators, for example, often find it difficult to evaluate competing requests from the many institutions in their states. Legislative and executive leadership seeks mechanisms to insulate legislators from decisions on the relative merit of budget requests from individual institutions.

The higher education coordinating structure appears attractive in many states because it promises an expert-driven structure for evaluating institutional legislative budget requests. While in many cases legislators reduce, expand, or otherwise change the consolidated budget requests received from the coordinating agencies or governance systems, they nonetheless start from a unified presentation. Most importantly, this arrangement provides a mechanism that insulates legislators from the bad news of denying budget requests and leaves them free to add good things to the higher education budget for their constituencies if funding and political forces make this possible. The appointed higher education governance and coordination system delivers most of the bad news, and the elected legislators deliver most of the good news.

In some states, this works well; in others, the governance system can become an antagonist of the legislature and executive branch, asking for much more than the state can afford and then blaming the legislature or the governor when funds fail to materialize. When this behavior grows too intense, states reorganize or restructure the governance system.

In the drive for efficiency and effectiveness, and again drawing on corporate models, states use the higher education governance system to achieve some measure of what they call accountability. Accountability is a term of art in higher education, especially public higher education. From the state's point of view, accountability is a process for measuring the effectiveness of higher education institutions principally in terms of their ability to produce functional graduates at low cost. While disguised by a wide range of subjective qualitative rhetoric, the driver of accountability is efficiency. State actors outside higher education, and many within, believe colleges and universities have little interest in effectiveness or efficiency. Universities have few standardized measures of efficiency and no equivalent to business-like profit statements or return on investment calculations. The accountability process presumes to imitate these business indicators with some academic equivalent.

Statewide governance systems, individual institutions, and independent state agencies all develop measures of accountability. Legislators and governors hope these will provide reasonable guidance for standards of institutional effectiveness and for public investment decisions about higher education needs. The results of the accountability movement have not realized the high hopes of many, but most statewide governance systems have some form of accountability program nonetheless.

Another key regulatory purpose is mission differentiation and program approval. Institutional mission differentiation appears in the formal master plans approved by most states or through historically determined or cooperative mission assignments as apply in other states. Many states, such as Florida, illustrate the difficulty of institution-specific mission differentiation even within single-board, multiple-university environments. Although that state's board of regents attempted to specify particular missions for its individual institutions at the time of their creation, over the years the power of local politics overwhelmed board policies as local constituencies mobilized to support mission expansion. Recent reorganization of higher education in Florida created the opportunity for community colleges to break the four-year degree barrier, a formerly substantial dividing marker for higher education mission differentiation.

No organizational structure adequately explains public higher education governance without a parallel understanding of the actual distribution of political power within state government.

Almost every state controls program approval to restrain local-campus constituency enthusiasm for duplicating prestige programs that exist elsewhere in the state. Medical schools, engineering programs, art and music programs, professional schools in law, medicine, public health, and veterinary medicine, architecture schools – these and many other specialties come at a high price although they bring prestige. Statewide program review and approval attempts to determine whether the state actually needs an additional program or advanced degrees or whether an existing program could meet the demand. States vary widely in their ability to contain program expansion and proliferation, as the creation of expensive prestige programs or advanced degrees is often a token of political effectiveness for the local legislative delegation.

States especially worry about high-cost programs such as medical schools. Although system organizations do not always prevent the proliferation of medical schools, some systems treat the medical enterprise as a distinct, separately administered entity. In such places, the medical enterprise becomes a separate campus, geographically apart from either the flagship institution or other major campuses. Sometimes the medical campus reports to the flagship campus, even if it is not closely connected to it in any organic way; at other times the system treats the medical campus as a stand-alone institution reporting directly to the system executive and board. These arrangements respond to legislative and institutional history that create opportunities in locations separate from the main campus, or they may serve to resolve conflicts of authority and responsibility by creating a separate relationship for the medical campus. Whatever the origin, the separate campus for a medical center changes the dynamics of relationships between the medical research program and the research activities on the system's research campuses. When the medical center is part of a research campus, it has a much greater impact on the research activities of other faculty in related and allied disciplines.

States vary widely in their ability to contain program proliferation, as the creation of expensive prestige programs is often a token of local political effectiveness.

State systems usually address a variety of academic standards issues. Admissions processes and transferability of credit among institutions within the state usually appear on the system agenda. Admissions issues reflect the implementation of the state's student access imperative of affording an opportunity for higher education to the widest possible state audience. Sometimes admission issues include limits on out-of-state students or establishment of minimum standards of entry, even when the admissions process itself is a local, institution-by-institution concern. Elsewhere, university systems operate common admissions processes for every institution, using standard forms and data, and standard criteria. In those systems, students usually have the option of selecting their preferred campus; the better their admission credentials, the better their chance of admission to the campus of their choice. State systems also specify other common characteristics of the admissions process, most recently in terms of the acceptability of affirmative action programs but also including special financial aid grants and exceptions for student-athletes, musicians, artists, alumni children, or donor relatives.

Statewide requirements about the transferability of credit from one state institution to another (community college to college or university, and between colleges and universities within the state) also reflect the state's commitment to institutional mission differentiation. If different colleges have different missions and different programs, students will often take some part of a program at institutions in one place and the specialized courses at another institution that has the mission to provide the special program, major, or degree. For this to work efficiently, student academic credits earned at one state college or university must transfer to every other in the state. Much effort in many states is devoted to ensuring this transferability, from transfer requirements to common course numbering systems that guarantee the course equivalency at all state higher education institutions. Because institutions vary in the quality of their student bodies and faculty, and in the range and extent of their academic resources, colleges and their faculty often resist these standardizing efforts. Sometimes they succeed; most often they do not.

Almost all states have a sharp distinction between community colleges that provide the first two years of the traditional four-year degree and colleges or universities that provide all four years as well as advanced degrees. However, linkage between the community college and the four-year institution varies from explicit formal linkages such as those in Florida to less comprehensive or restrictive transfer rules and agreements that apply in other states.

Whatever the governance model, systems all focus on generating revenue. In public university contexts, the governance systems of boards and commissions

focus primarily on the funding that comes through the political process at the state level. Systems may share this function with people and organizations located at the individual campuses, but they generally assume the primary responsibility to deal with the state on issues of budget and finance. Depending on allocation of authority and responsibility to campuses, system officers also may control or participate in private fund-raising, commercialization of intellectual property, and operation of revenue-generating enterprises such as distance education or economic development programs. In these activities, however, the system usually serves as the agent for campus-based, faculty-created content.

In fund-raising, for example, few donors give to a system of higher education. Most give to a campus, and even more specifically to an individual school, college, or program. Systems can provide a range of support to campus fund-raising that enhances the ability of colleges, departments, and campuses to attract gifts. The most effective support comes from matching programs that usually appear as system-wide, state-funded efforts. The details of these programs vary, including direct dollar-for-dollar matches at ratios of 1 to 1 or, more commonly, some proportion of the gift dollar matched by state funds. Other programs exist where the system uses state funds to match the anticipated income from the endowment gift but does not transfer state dollars into the endowment.

Systems also supply other less visible, but often important, support. They can delegate authority and responsibility for fund-raising to campuses, increasing the effectiveness of fund-raising activities, or they can authorize the creation of campus-based foundations that give donors a clear sense of confidence that their gifts will stay at the campus and serve designated purposes. Some state systems deposit foundation money in state accounts, but most give the campus foundation the authority and responsibility for managing the endowment. Statewide systems generally support campus-based capital campaigns and encourage their success.

In their role as revenue generators, systems often serve to combine campus resources when a revenue opportunity appears that does not fall fully within the mission of a single campus. In such a role, the system can encourage or force campuses to cooperate, combine resources, and deliver services. Sometimes campuses defend a local self-interest and decline to cooperate in statewide multi-campus activities. The system can exercise its authority to force cooperation and collaboration. The system can also serve as a supervising entity for large-scale research programs that fall outside the direct mission of the campus, require separate funding, or need state funding that the system can guarantee. Independent national research laboratories, for example, often exist outside the direct control of a campus reporting to a system-level governance entity, although drawing on the intellectual strength of the campus' guilds for their work and their academic prestige.

Imperative of Statewide Governance

The needs of the state, expressed in political terms through the actions of legislatures, elected executive branch officials, and permanent state bureaucracies, result in an intervention in the affairs of the public research university, delivered through the intermediary of the university's governance system. If efficiency and effectiveness become an issue, states create or mandate accountability programs loaded with good intentions but usually without significant effect. If access becomes an issue, states determine the distribution of students to institutions, offer incentives to expand existing institutions, create new ones, and evaluate competing plans for providing access. If cost becomes a significant issue – and it always does, states can use the governance system to shorten the time to degree, reduce the expense of research faculty, limit the personnel costs of teaching, and expand the lowest cost options for undergraduate education. If economic development becomes a priority, states can review technology transfer programs, encourage the licensing of technology to in-state corporations, and expect increased engagement of university people in local or statewide economic development.

Public university systems, rather than individual campuses, assume primary responsibility for dealing with the state on budget and finance.

These imperatives, expressed in as many forms and with as many variations as there are states, often lead to frustration as research universities fail to respond to the perhaps unrealistic expectations of the political and bureaucratic leadership. While this sometimes prompts specific legislative intervention in the academic process, more often it produces reorganization and reconfiguration of the higher education system with stronger hierarchical structure. This enthusiasm for changing the organization usually responds to a belief that public higher education fails to meet political objectives because of a failure of central control, direction, and authority.

Relationship of Governance to Research University Competitiveness

In the conversation about governance, the proponents of particular organizational models or reorganization schemes usually assert that one or another structure is clearly superior for quality higher education. While it is relatively easy to find dysfunctional behavior in complex public higher education systems attempting to coordinate and manage highly diverse institutions with multiple and differing missions, it is much more difficult to find ideal types adaptable to the many different state environments. What works in California does not translate to New York. What proves successful in Indiana does not have a future in Florida. What appears successful in Michigan has no currency in Louisiana. Each of these models is a political not an educational artifact, and it responds to the local political concerns of the state it serves. The multiple variations on the basic organizational models described above that appear in different states at different times provide eloquent testimony to the locally adaptive character of public university system organization.

It is difficult to find ideal types of public higher education systems. Each is a political artifact designed to respond to the local concerns of its state.

The impact of statewide governance structures on the functioning of individual institutions varies. For those institutions primarily focused on the production of undergraduates for immediate employment after graduation, the form, organization, and supervision of statewide governance boards and local institutional boards have a significant impact on university behavior. For research universities, however, the impact of these governance mechanisms is much less. The undergraduate-producing institution often has a much higher percentage of its budget derived from state-controlled resources than the research university. The faculty, staff, and students of these primarily undergraduate colleges and universities serve a predominantly regional or, at most, statewide constituency.

Research universities, however, focus on competitiveness with their national peers and produce graduates for a national marketplace. As a result, changes in statewide governance often have a much greater impact on predominantly undergraduate institutions than they do on research universities, even within the same system.

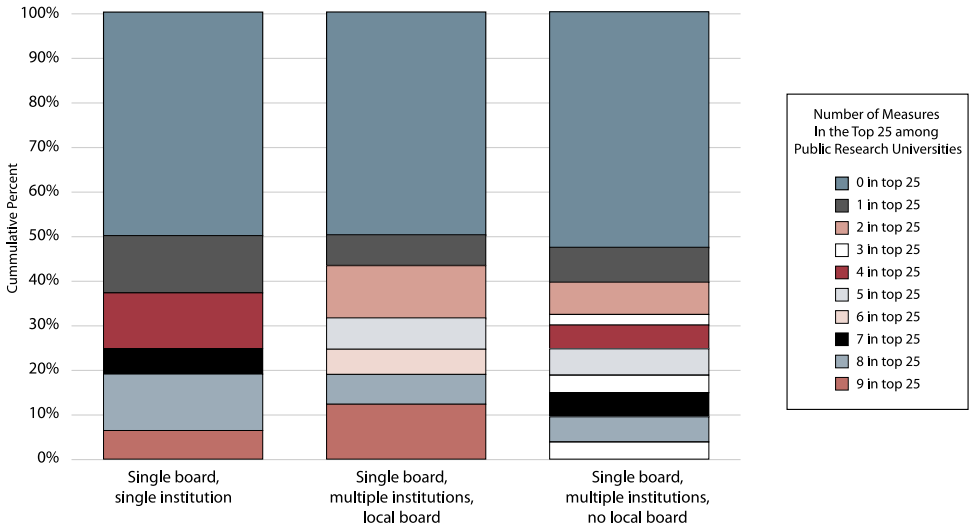
Research campuses in complex governance systems often have the best students, the best faculty, and the most extensive facilities of any higher education institution in the state. Compared to their teaching-focused counterparts, they have more alumni support, provide more service to the state, and have more prestige. Their financial requirements are high because they tend to have high-cost programs, professional schools, and other facilities that are critically important for the success of many state economic development initiatives. When a state applies accountability mechanisms in an attempt to measure and reward effectiveness, research universities usually meet or exceed the targets set for all state universities. They have the best students, residential campuses, strong student services programs, and with these advantages, they usually meet graduation, retention, and enrollment targets. They have many unique programs and can always demonstrate unique contributions to the state. Their research strength leads to significant economic return to the state from employment, economic development programs, spin-off industries, and technical assistance to state agencies and private enterprise. A research university with a research-oriented medical school and affiliated hospital can always demonstrate a major contribution to the state's health care, especially for indigent and uninsured patients.

All of this makes statewide governance an important issue – but not a controlling factor – for public research universities. Indeed, in many cases, much of the statewide governance activity – of vital interest to those who work in the university's shell organizations – has little direct impact on faculty work. Although salary issues, arguments about faculty rights, union rules, credit transfer regulations, curricular controls, and program approvals may depend on the statewide governance system for answers, the issues themselves and the state's responses to them do not appear to depend much on the form of governance.

If we look at all the universities with more than $20 million in federal expenditures in 1999, and arrange them by type of governance, we can see that they fall into two obvious groups. The private universities all have single boards, and the advantage of their organization derives primarily, we believe, from the private board's role in support of the institution.

The second group includes all public universities. Within each of the three general types identified here, we find highly competitive institutions as well as those with less success. Of those with a single board for a single institution, just under half have at least one of our measures in the top 25 among public universities.

Public Research Institutions by Governance Type and Number of Measures in the Top 25



Just over half have no measure in the top 25. Of those with a single board governing multiple institutions and the institutions with a local board, half have at least one measure in the top 25 and half have no measure in the top 25. Finally, of those with a single governing board over multiple institutions and no local board, again, half have at least one measure in the top 25 and half do not.

These data indicate that highly competitive public universities and those significantly less competitive work within all types of governance systems. Governance structure, in our view, is not a critical dimension of public research university success.

This conclusion requires a tight focus. Public university systems have many functions and serve many purposes in the political life of states. Systems often take on lives of their own, maximize advantages that they find significant for their executives, board members, and other personnel, and project themselves into local and national political and academic space to enhance their importance. From our perspective on and experience with the competitive success of research universities, however, the particular organization of a university system is much less important than other characteristics of the environment in which the research campus exists. Delegated authority for most academic and administrative decision to the campus, strong support for quality and productivity, and effective research administration all contribute to the success of highly competitive institutions. The same system at some times may support and at other times inhibit the aspirations of the research campus. These different outcomes depend not on the structure of the organization but on the quality and perspectives of the people who direct the system. If those people share the aspirations of the research university, they can help it succeed. If they seek other goals, usually related to local or state political agenda or personal career advancement, they may see the national perspective of the research university as an obstacle to their local ambitions and inhibit the institution's research success.

Other characteristics than organizational form make more of a difference. Universities whose states provide more money have a relative advantage in the competition for quality than those whose states provide less. Money matters for the support of research and the acquisition of quality students in all universities. While the complexity and variety of institutional arrangements make strong statements about the causes of research university success rather speculative, we nonetheless think that the following represent reasonable starting points for discussion. As our model suggests and as the relationship between financial support and performance discussed below appears to indicate, public and private research universities with strong financial support do well – no matter what organizational model governs them. It is difficult to know whether states with clear mission differentiation for their institutions or systems such as California and North Carolina succeed because of the differentiation or whether the clarity in missions is the result of long state traditions that govern investment in high-quality universities. Nonetheless, public research universities in states with clear mission differentiation separating research-intensive and teaching-intensive institutions generally appear to compete more successfully than in

those in states where differentiation is ambiguous. Following our hypothesis that money matters, we would expect public research universities in states that enjoy a long tradition of investment in and appreciation for national quality in research and students to compete better because of their stronger financial support than similar institutions in states that focus primarily on undergraduate access and degree generation.

Universities whose states provide more money have a relative advantage in the competition for quality.

From the perspective of system officers, however, the view of university success may well appear differently than it does from the research campus. The university system is a super shell entity removed from the teaching and research work of academic life. Some university systems acquire derived assets such as distance education enterprises, continuing education, and economic development, but, even so, they depend on the work of the faculty guilds in the core of each of the system campuses for their legitimacy and success.

Given the remarkable diversity of organization and structure, the stability and familiarity of the internal organization of the research university – what we call the academic core – is remarkable. Whatever the structure of the administrative shell and whatever the higher-level organization of systems or statewide governance, every research university, at the level of the guilds where the teaching and research work is done and where the curriculum is defined and delivered, appears similar and functions in almost identical ways. Indeed, from the perspective of the academic core of the university, most of the conversation that occupies the attention of political actors at the university shell and governance system, and the legislative and executive branches, appears almost irrelevant. In the end, what matters for the faculty and students is the teaching and research of the academic guilds, activities regulated by a range of accrediting agencies for teaching, degrees, and research in many professional fields, and by national guild-based peer review for research publication and grants. If a state transforms its entire higher education organization, reconstitutes individual universities into systems with a single board and a single chief executive on behalf of the system, the faculty and students on each campus will continue as before and do almost exactly the same things in the same ways and using the same standards. If the new system provides more money, they will do better perhaps. If the coordination changes transfer requirements and similar student-related conditions, some segments of the institution may see an impact but, for the most part, the academic core in public research universities functions in the same way, whatever the statewide organization.

Not so in the institution's administrative shell, where changes in system organization have a profound effect on the balance of power, authority, opportunity, career possibilities, and administrative functions. With consolidation into systems, individual shell officials from presidents or chancellors to registrars, from financial affairs officers to police departments, all find themselves dealing with new relationships. In some cases, they acquire new authority if the change decentralizes functions; in other cases, they lose authority if the change centralizes functions. In either case, the jobs of the shell participants change with the governance structure. For this reason, debates over system changes often engage shell actors directly and they become major participants in the controversies that always surround major political restructuring of state university governance.

While forms of organization vary within state systems, the actual architecture of the system appears to us much less important than the distribution of authority and responsibility throughout the system. In reviewing the details of delegated authority for a number of highly competitive institutions within complex systems, the pattern of delegating substantially all academic and administrative authority to the campus is evident. The implications of an organizational change depend on the details of the resulting arrangements and delegations of authority, and the impact of any change will vary depending on the capabilities and needs of each campus. The success of any particular university system also depends as much on the quality of the governing organization's leadership as it does on the precise organization. A governance structure with strong and effective leadership can help the research university succeed; the same structure with weak leadership can inhibit success.

Cost, Complexity, Regulation, and Money

Our principal concern in these reports is to understand the competition that defines the American research university. We have identified some of the measurable areas of competition for the scarce resources that define research university success, and we have looked at some of the characteristics of universities that influence this competition. We have found that the size of an institution helps explain at least some part of the competitive research success of

public, but not private, universities, and we have seen that the presence of a research-intensive medical faculty is a significant asset in this competition, even if the mere existence of a medical school is not. We have noted that public research universities dominate the competition for federal research dollars, although some private universities continue to compete exceptionally well.

The examination of the differences between public and private research institutions led us to reconsider our original notion that we could approach the analysis of competition among research universities by looking at public and private universities separately. The competitive model we found shows public and private research universities competing in remarkably similar ways for students and faculty, federal grants and contracts, and private resources. As a result, after the first year, we redesigned our *Top American Research Universities* to present public and private universities together, although we continue to offer separate presentations to maintain consistency with the first report and to support our colleagues who found the data useful when displayed by institutional control.

In this review of institutional organization, in which we anticipated identifying some other elements distinguishing public from private institutions, we have two tentative conclusions.

- First, the impact of large-scale organizational structures in the public sector does not appear to have a major effect on the competition for research or for high-quality students in major research universities. While differences surely exist between public and private undergraduate programs, most public research universities find ways to compete for the best students and to deliver excellent undergraduate results in every organizational model we reviewed. However, the success of public universities in the student competition is somewhat obscured by the wide range in student quality in most of the large, high-quality public institutions. The students recruited into public university honors programs, for example, have SAT scores and other quality indicators equivalent to those of the highly competitive private universities.
- Second, these often elaborate and hierarchical public organizational structures within which public research universities function clearly create inefficiencies, duplicate work, and generate high administrative costs compared to the relatively lean and flat structures that govern private institutions.

Why then, do public universities perform so well in the competition for the scarce resources that define research university success? The answer is not all that complicated. It is the money. Understanding university money is complicated by the accounting standards followed by public and private universities (which use different standards) and by the organizational differences among public universities (which define expenses and income in different organizations or at different levels of the state bureaucracy). Nonetheless, it is our belief that the contribution of state tax dollars to public research universities more than compensates for the added cost and inefficiency that are a consequence of complicated public governance structures.

The contribution of state tax dollars to public research universities more than compensates for the added cost and inefficiency that are a consequence of complicated public governance systems.

In our data, we include two items of institutional resources: endowment assets and annual giving. These two items provide an indicator of how well universities (and their related foundations) compete in the private marketplace for gifts in support of student and research quality. In these data we easily see that private universities often have significantly higher totals than their public counterparts. In 2001, among the research universities in our study (those with more than $20 million in federal research expenditures), the private institutions' median endowment at $1.1 billion is four times greater than the public universities' endowment of $250 million. Their annual giving shows a median of $94.8 million for privates and $45.0 million for publics. However, because institutional resources are so critical to the ability of research universities to compete, we are not satisfied with these indicators.

Resources represent a complicated notion for universities. In this conversation, we draw on the work of the Williams Center directed by Gordon Winston and the useful article by Bradburd and Mann published in 1993, both cited below. We have explored the possibility of identifying all the assets and obligations of an institution and then, by various means, translating these assets less obligations into an index of institutional wealth. This is not easy to do, as the papers of the Williams Center and the Bradburd and Mann article show – not only due to accounting rules that do not allow clear distinctions but also because

Accounting rules and practices do not lend themselves to a clear understanding of the institution's total resources.

publics present their financials by fund group while private universities do not. In the case of private universities, current accounting rules permit capture of the entire enterprise; with public universities, only the operating budget is as easily accessed. The Governmental Accounting Standards Board (GASB) has established a new reporting model that will require all universities, both public and private, to report on an entity-wide basis in their financial statements by fiscal year 2002.

In addition, public universities have many different methods of holding and managing assets. Buildings and grounds, debt, retirement accounts, and similar elements of a public university's total assets appear in different places for different institutions and systems. In some states, plant belongs to the state and is accounted for as a part of the state's assets. Retirement fund balances and large obligations such as worker's compensation or liability and property insurance can belong to the state and not the university. Debt may be located at a university campus, consolidated for many universities at a system office, or held by the state itself. The variety and significance of these different methods of managing public money for universities are exceptional. In addition, universities, public and private, hold other kinds of assets in different ways. Medical practice plans, hospital assets and budgets, athletic association funds, private endowment balances and income, and similar sources of funds can appear inside the university's accounting system or within other entities. Although, in theory, detailed work with state and institutional accounts might permit a resolution of some of these problems, as a practical matter we do not believe we have the tools yet to construct a clear, institution-to-institution comparison of total assets.

Endowment-Equivalent

Nonetheless, money matters. In exploring the trade-off between complexity and money that is part of the explanation for public research university success in the competition with private universities, we developed a rough sketch of the comparative endowment and endowment-equivalent resources available to public and private research universities. To do this, we drew our inspiration from a notion originally proposed by Bradburd and Mann (1993). Looking only at research universities, we start with their 1999 endowment assets at market value. Then, we take their annual giving for 1999 and convert this to an endowment-equivalent.

By endowment-equivalent, we mean the amount of endowment that would be required to generate this annual giving income stream. We assume an endowment payout of 4.5%, which represents the generally accepted and widely used 5% spending formula calculated upon a moving three-year (or 12-quarter) average. We derived this estimate from the methodology used by Moody's Investors Service for evaluating the creditworthiness of colleges and universities.

Thus, to get the endowment-equivalent of the annual giving stream, we take annual giving and divide it by 0.045. Using the same methodology, we convert the state appropriation into an endowment-equivalent. This is obviously a much more important element for public than for private universities, but many private institutions have state subsidies of various kinds.

The final income stream we identify is gross tuition and fees. Although tuition is widely discounted through institutional financial aid, our interest is in the potential endowment-equivalent resources available to the university, and so for this purpose we use the gross tuition and fees. We also convert this income stream into an endowment-equivalent.

To get the total endowment-equivalent for private and public universities we add these items:

- regular endowment
- annual giving endowment-equivalent
- state appropriation endowment-equivalent
- tuition and fees endowment-equivalent

These calculations do not provide a total for all university assets that generate income or value for the university. Accounting rules and practices for universities, as we have mentioned before, do not lend themselves to a clear understanding of the institution's total resources. Especially for public universities, many elements of the university's total resources may not even appear on the university's financial statements. For example, in some states, the state pays debt service and carries this expenditure on the state's accounts, not the universities'. As a result, the university has the use of more resources than appear on its statements because the institutional financial reports understate the institution's income by the amount of debt service paid on its behalf by the state. Not all resources held in private foundations on behalf of the institution or in various auxiliaries that support the institution appear in uni-

versity reports. When universities are part of complex systems as described previously, the distribution of the costs and benefits of the system may not appear in ways easily attributable to the university benefited or charged.

All of this recommends significant caution when using the data we develop and present here. The purpose of the exercise is to assess in a general way the relative economic strength of public and private research universities, not to present a comprehensive and complete analysis of institutional assets and liabilities, or to compare individual institutions. Our interest in a general comparison of public and private institutions is to show how public universities, by virtue of the constant support provided by their state governments from tax revenues, often have comparable financial resources to invest in quality, compared to private universities with apparently large endowments. This is a conservative approach because most of the errors that come from the inability to deal with capital expenses reduce the apparent resources of the public universities. That is, they have more to work with than we have captured here. If we can show that the public institutions appear to have as much or more in financial resources than many of their private counterparts, we are likely underestimating the public institution's advantage.

Differences in scale among universities suggest another adjustment. Some of the apparent financial strength of the public institution may be deceptive because it reflects the cost of large-scale undergraduate instruction. This is an important function of public universities. It is not, however, one of the competitive issues for research universities who compete for student quality and faculty research productivity. To adjust for this factor of scale, we also present the data after deducting the endowment-equivalent supporting basic instruction. We use $7,000 as the basic cost for an undergraduate FTE, $8,750 for a graduate FTE, and $20,000 for a professional school FTE. The undergraduate baseline cost comes from the NACUBO *Cost of College Study* (2002), using the 10th percentile for four-year public universities and estimating graduate education at 1.25 times the baseline cost of undergraduate instruction. The estimate for the baseline cost of a professional student FTE is more tentative than the others used here. Some professional programs in medicine and veterinary medicine have very high costs; we estimate others, such as law, at much lower cost. Our estimate of $20,000 is our best approximation of a baseline cost for professional school FTEs.

The following graphs plot the total endowment-equivalent for private and public universities in rank order. As we showed in previous publications, about twice as many public institutions meet the minimum of $20 million in federal research expenditures as private universities. This reflects the investment of state revenue in public universities that has allowed them to build sufficient capacity to compete successfully against their private counterparts. The graph helps us understand the basis for the emergence of the research-intensive public universities. In terms of total endowment-equivalent, before adjusting for the factor of enrollment, the graph shows that public universities rank with private universities in terms of the resources measured here at every level. This result, however, likely overstates the impact of public university resources from state appropriations for large undergraduate enrollments.

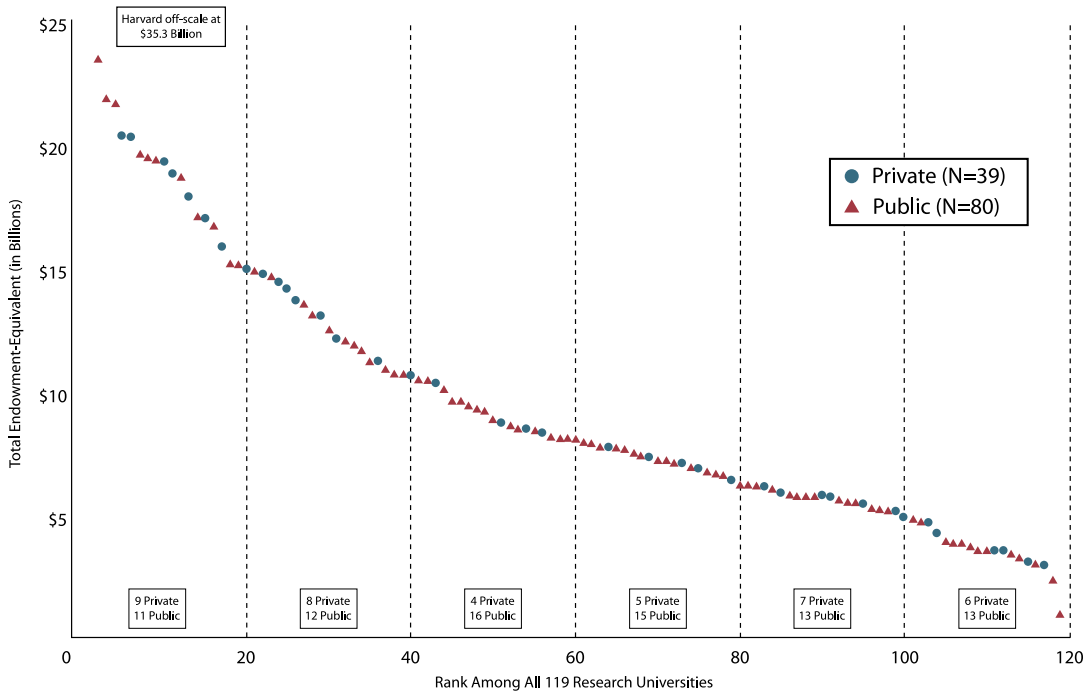
Public funding of public institutions more than compensates for the higher endowments of private universities.

If we then adjust downward the total endowment-equivalent to account for the extra income public universities get as a result of their larger enrollments funded with state dollars and tuition and fees, the pattern changes slightly. While public universities remain competitive in every category with their private counterparts, the private institutions in the top 20 outnumber the publics. Indeed, a disproportionately smaller number in the last two groups balances the disproportionately larger number of private universities in this top group.

Insofar as success in the competition for quality requires substantial resources, the data reflect the public institution's ability to acquire the necessary funds. Public funding of public institutions more than compensates for the higher endowments of private universities.

Although this adjusted total compensates for different levels of student enrollment between public and private universities, it also compensates for different levels of enrollment within the two control groups. This has the effect of changing the order of private and public universities between their total endowment-equivalent rank and their enrollment-adjusted total endowment-equivalent rank. These changes are not particularly significant, however, as the r-square between the rankings on the adjusted vs. the non-adjusted total endowment-equivalent is 0.95 regardless of ownership. In other words, the rank order for both publics and privates changes very little with the adjustment for size.

Total Endowment-Equivalent
Universities with More Than $20 Million in Federal Research in Rank Order



While these calculations do not give us a full picture of the total resources available to public and private institutions, they suggest that public universities have substantial revenues equivalent to or exceeding those of their private counterparts for investment in support of those elements of quality they identify as most important. Some of this revenue, as discussed in detail in the Williams Center papers, supports subsidies for educational quality expressed both in the form of tuition discounting and added enhancements to the quality (and expense) of undergraduate education.

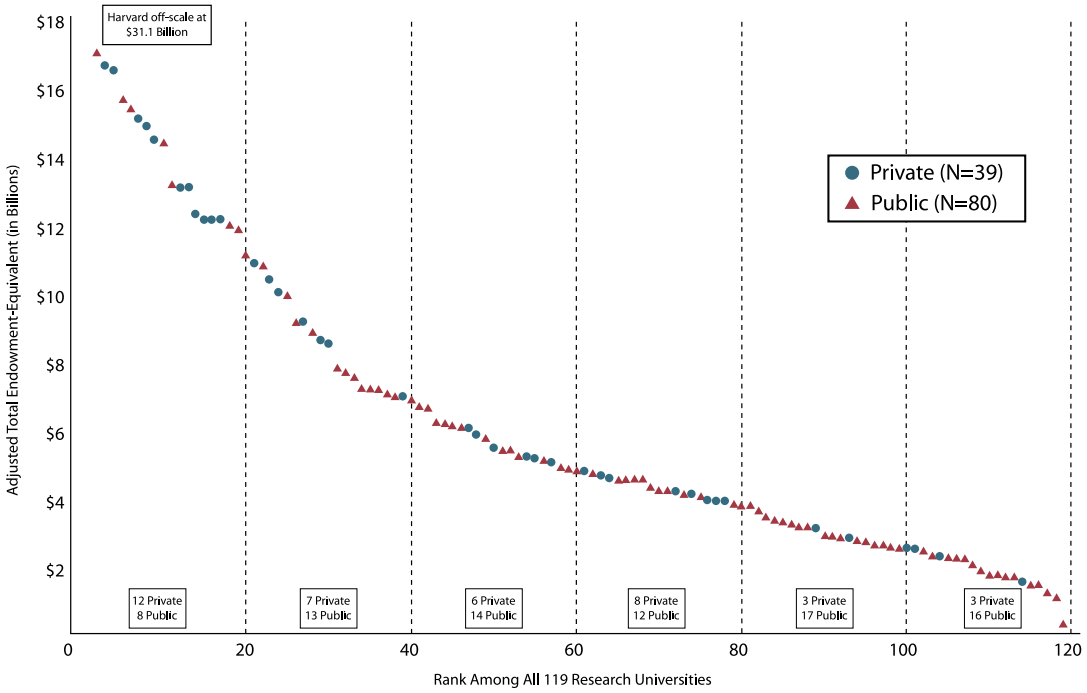
The other investments support the added costs of high-quality research. As we discussed in more detail in the *The Top American Research Universities (2001)*, academic research requires extensive support from university funds because grants, contracts, and other forms of external support do not pay the full cost of the research produced. This additional support, like the subsidies and enhancements for high-quality undergraduate education, comes primarily from endowment income or, in our model, from the total endowment-equivalent income generated by public and private institutions.

Given the substantial resources available to public institutions, as identified in this discussion, it is not surprising to find so many public universities competing successfully against private universities both for high-quality students and for research grants and contracts. Only in the top category do more private universities have enrollment-adjusted total endowment-equivalent resources than public institutions. More detailed research may provide us with a clearer indication of this public university strength in the competition for academic quality, but our example here probably underestimates the public institution's competitive advantage in supporting the competition for institutional quality among research universities.

We have reviewed a few of the benefits that some, but not all, public institutions enjoy that do not always appear in public university accounts. In addition, we should note that these benefits can also include state-funded retirement systems, debt financing held by the state on behalf of the university, provision of sovereign immunity to faculty physicians that dramatically reduce the cost of malpractice insurance, state scholarships paid directly to students attending public universities, and similar benefits that correspond to the details of state arrangements with their public institutions. While these benefits vary greatly from public institution to public institution, all of them enhance the resources that public universities have in their competition with each other and with their private counterparts for high-quality students and research.

We have not yet fully explored the close relationship between institutional resources and the competition for federal research funding, but it appears likely that the substantial funds available to private and public universities as reflected in their adjusted total endowment-equivalents provide a source for strong support in this competition. We use the adjusted figure to estimate the potential institutional resources available to the university for supporting all forms of

Total Endowment-Equivalent Adjusted for Student FTE Enrollment
Universities with More Than $20 Million in Federal Research in Rank Order



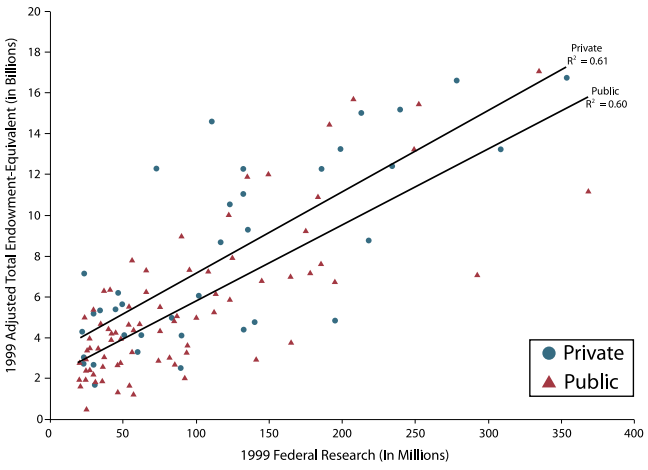
quality competition, including research, once it has covered its basic teaching costs. The plot of public and private university adjusted total endowment-equivalent against federal research expenditures shows a strong linear relationship.

In this case, the adjusted total endowment appears to explain about 60% of the variance in federal research performance for both public and private institutions. Of course, these highly competitive institutions use their disposable income to support the acquisition of quality students and other university priorities. Nonetheless, we believe this relationship reflected in the r-square of about 0.60 indicates that the substantial resources reflected in these data explain a significant part of the success of the top research universities in the competition for federal research dollars. In this calculation, we do not include John Hopkins and Harvard because they are extreme outliers on federal research and total endowment-equivalent, respectively. Their inclusion in this analysis distorts the results and reduces the private institution r-square to 0.27.

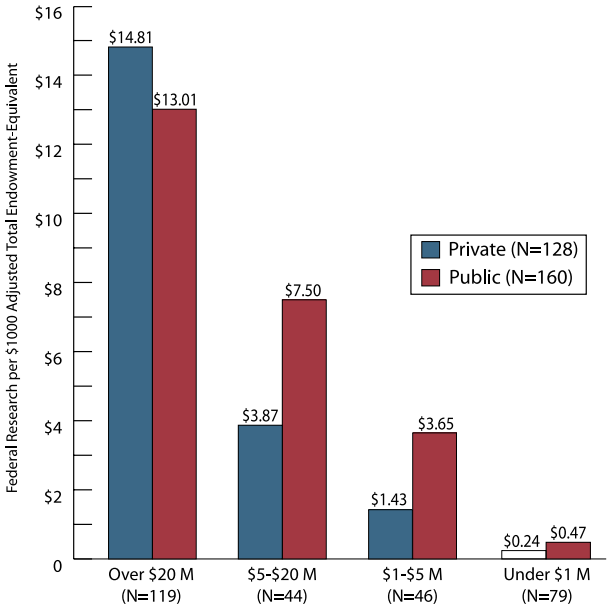
Another way to view this relationship is to look at the relationship of federal research to adjusted total endowment-equivalent. We calculated the amount of federal research expenditures per $1,000 in adjusted total endowment-equivalent for each of the 288 institutions in our sample. We then grouped the institutions into four bands based on their level of federal research in 1999. Within each band, we calculated the median amount of federal research expenditures per $1,000 for private and public universities separately.

In the group of universities with more than $20 million in federal research expenditures, public and private institutions not only have similar expenditures per $1,000 but also appear to have significantly more adjusted total endowment-equivalent resources relative to their research volume than do their less research-intensive counterparts. As we showed in last year's report, this group of institutions at the very highest level of performance is in a category of its own. The federal research expenditures per $1,000 for private universities, in particular, demonstrate the substantial differences between this group of top competitive research universities and the other private institutions.

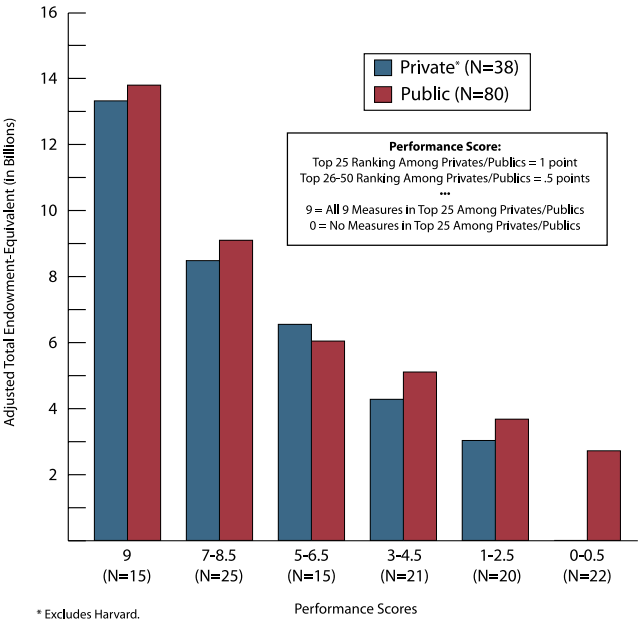
Adjusted Total Endowment-Equivalent and Federal Research
Universities with More Than $20 Million in Federal Research
(excluding Harvard and Johns Hopkins)



Federal Research per $1000
Adjusted Total Endowment-Equivalent
Median of Research Group by Control



Mean Adjusted Total Endowment-Equivalent
by Performance Score and Control
Universities Over $20 Million in Federal Research



* Excludes Harvard.

The more than $20 million private institutions' median federal research expenditures per adjusted total endowment-equivalent is nearly four times as large as that of their closest competitive group (those with between $5 and $20 million). In contrast, the top public universities' median federal research expenditures per $1,000 is less than two times as great as the second band of publics. Instead, the big break point for public institutions occurs at the bottom of the scale, where the median federal research expenditure per $1,000 of the $1 to $5 million publics is nearly eight times as large as the median for those public universities with less than $1 million in federal research expenditures. These relationships do not tell us how universities spend their money, but they give a sense of the resources available to institutions at the different levels of research intensity. A detailed set of case studies would allow us to understand the different ways universities allocate their funds in support of research, instruction, and other university priorities.

We also categorized the research universities in our over-$20-million group by their performance scores in *The Top American Research University*'s taxonomy (2001). This view of the data helps us understand how the resources identified here relate to the total success of the top research universities in all the areas included in our reports. We assigned a score of 1 for every measure the institution had ranked in the top 25 by control (public and private ranked separately) and a score of 0.5 for every measure the institution had ranked from 26 to 50. Universities can range from a high score of 9 (all top 25 rankings) to a low of zero (no rankings in the top 50). The chart included here clearly shows that the universities in the group with the highest performance on our measures also enjoyed, by far, the highest mean adjusted total endowment-equivalents. Reinforcing our earlier examination by rank order, in nearly every performance category, public universities have higher mean adjusted endowment-equivalents than their private counterparts.

In short, money matters. Public universities probably have as much of it to spend subsidizing the cost of high quality as private universities do, and most public institutions have stronger resource bases of total endowment-equivalent than their private counterparts. Public institutions with high total endowment-equivalents and high performance in the quality elements defined by our reports exist under every governance type. For all universities, public or private, money matters, but public universities benefit greatly by their organization as state-supported entities. Within public universities as a group, the amount of money available to support quality is likely to be much more important than the specific details of state governance organization.

Some References on University Organization and Finance

The search for an effective and stable organizational model for state systems of higher education has a long history. The simple cataloging of the various state models alone accounts for a significant amount of effort, mostly sponsored by organizations focused on higher education such as the Carnegie Foundation, the Association of Governing Boards, and the Education Commission of the States. One of the earliest efforts to address the issue of higher education organization is in Robert J. Leonard's *The Coordination of State Institutions for Higher Education Through Supplemental Curricular Boards* (Berkeley: University of California, 1923), which, although narrow in scope because it focuses on only three states, nonetheless raises many of the issues that continue to drive organizational change today. More comprehensive early treatments came a decade later, in 1933 and 1934, when The Carnegie Foundation for the Advancement of Teaching helped sponsor Fred J. Kelly and John H. McNeely's *The State and Higher Education: Phases of Their Relationship* (New York, 1933, in cooperation with The US Office of Education) and Edward C. Elliott and M.M. Chambers' *Charters and Basic Laws of Selected American Universities and Colleges* (New York, 1934, in cooperation with Purdue University). *The State and Higher Education* offered a comprehensive review of college and university organization in 10 selected states with charts outlining the composition of boards and their functions and relationships along with other information on the missions of institutions including a chapter on "The Trend toward Unified Control." *Charters and Basic Laws* gives a succinct summary of the charters and powers of 51 universities, over half of which are private. All of the themes that inform subsequent studies of this topic of university organization appear in these pre-World War II publications – further evidence of the persistence of the dilemmas faced by public university organizations and the difficulty of arriving at satisfactory organizational paradigms.

Over the years, a significant literature on these topics emerged, responding in part to the endless changes and modifications in university governance and the characteristics of state university organization. For an interesting account of the process by which "colleges" became "universities," see Christopher C. Morphew's article, "'A Rose by Any Other Name': Which Colleges Became Universities," *The Review of Higher Education* (25:2, 2002) 207-223. The renewed interest in the topic of organization of state systems that marked the 1960s is visible in a comprehensive review of *State Boards Responsible for Higher Education* by S.V. Martorana and Ernest V. Hollis (Washington, D.C.: U.S. Department of Health, Education, and Welfare, 1960). This state-by-state analysis with organizational diagrams and a variety of other analytical and descriptive information outlines the functions, powers, and responsibilities of the various units within these organizations. A slightly later view revisits these questions in a series of essays edited by W. John Minter, *Campus and Capitol: Higher Education and the State* (Boulder, Colorado: Western Interstate Commission for Higher Education, 1966). Of particular interest for our purposes are three essays on state higher education coordination and the excellent annotated bibliographies that accompany them: Samuel B. Gould, "The University and State Government," pp. 2-15; Daniel G. Aldrich, Jr., "Maintaining Institutional Identity and Autonomy in Coordinated Systems," pp. 16-24; Lyman A. Glenny, "Politics and Current Patterns in Coordinating Higher Education," pp. 26-46; and the annotated bibliographies on pp. 121-147.

The 1971 report on *The Multicampus University: A Study of Academic Governance* sponsored by The Carnegie Commission on Higher Education by Eugene C. Lee and Frank M. Bowen (New York: McGraw-Hill, 1971) provides another effective update on the evolution of university systems and once again illustrates the continuity of issues and the contextual nature of university organization. The authors offer this conclusion that sounds as current to us today as it must have in 1971 (pp.421-422):

"The *organization* of higher education will not determine the place or the future of the university in society. Whether a state has a single-board system or single-campus institutions; whether it has a strong coordinating agency or a multicampus system...; or whether it has some combination of these—none of these factors will *in and of itself* solve the problems of higher education in the 1970s. [. . .] None of the alternative patterns of organization is better or worse in abstract. They take shape and can be evaluated only in terms of the environment within which they are set. Particular sets of political and social circumstances may dictate a pattern of organization which could not survive in a different context."

Indeed, the same authors have this to say in their introduction to an excellent volume of essays published in 1999 (Gerald H. Gaither, ed., *The Multicampus System: Perspectives on Practice and Prospects*, Sterling, Virginia: Stylus Publishing, 1999, p. *x)*:

"The world is a different place than it was thirty years ago. But have multicampus systems changed as much as the world around them? *Plus ça change, plus c'est la même chose*. As significant as are the changes discussed in the essays, much remains the same."

Robert O. Berdahl, in "A View from the Bridge: Higher Education at the Macro-Management Level," *The Review of Higher Education* (2000, 24:1) 103-112, a review of Gaither (ed.), *The Multicampus System (*1999), and in Richard Richardson, Kathy Bracco, Patrick Callan, and Joni Finney, *Designing State Higher Education Systems for a New Century (*Phoenix, AZ: American Council on Education/Oryx Press, 1999), offers an insightful view of these issues, drawing on the perspective of 30 years of involvement in this conversation as reflected in his earlier much-cited work *Statewide Coordination of Higher Education (*Washington, DC: American Council on Education, 1971).

Reflecting the continuity of issues and concerns that define the organizational efforts of states on behalf of public higher education as viewed from the mid 1980s, John D. Millett's *Conflict in Higher Education: State Government Coordination Versus Institutional Independence* (San Francisco: Jossey-Bass, 1984) provides a useful historical view and an in-depth analysis of 25 states categorized by the author's typology of higher education governance systems. In the late 1990s, D. Bruce Johnstone revisited this discussion based on his many contributions to our understanding of system operations and university finance in an excellent essay on "Management and Leadership Challenges of Multicampus Systems," in the Gaither volume mentioned above.

In 1995 Richard Novak compiled an annotated bibliography that provides a good overview of the literature in *Statewide Governance, Coordination, and Trusteeship in Public Higher Education: An Annotated Bibliography* (Washington, DC: Association of Governing Boards of Universities and Colleges [AGB], 1995). Indeed, the AGB's commitment to this topic is understandably keen, and the association has sponsored a number of publications that explore the controversies and conversation about the best way to organize and manage public universities. For examples of this literature, see the collection of articles from the AGB-sponsored magazine *Trusteeship* that appears in *Trusteeship Portfolios, Governance of Public Higher Education* (Washington, DC: AGB, 1999), many of which speak to either organizational issues directly or to the difficulties of managing universities within existing organizational models. This follows on the AGB's publication *Bridging the Gap: Between State Government and Public Higher Education* (Washington, DC: AGB, 1998), a call to action on various issues of governance that touches on questions of organization and the distribution of responsibility and authority.

Another useful study appeared in 1998 sponsored by The National Center for Public Policy and Higher Education (Richard C. Richardson, Jr., et al., *Higher Education Governance: Balancing Institutional and Market Influences* (San Jose, California, November 1998) that used a seven-state analysis to illustrate a new analytic model. In rejecting the classic definitions of state organization (consolidated governing boards, coordinating governing boards, and planning boards), the authors wrote "...these three designations, despite their earlier usefulness, are now insufficient for examining the relationships between public policy and state systems that overarch individual institutions"(p. 5). They propose instead a taxonomy using segmented, unified, and federal as the appropriate descriptors and focus on the policy issues that states address when they decide on governance structure, educational mission, institutional capacity, and work processes.

Among the agencies concerned with these issues, exceptionally detailed and current information on public higher education organization appears through the work of the Education Commission of the States [ECS]. In addition to the useful paper by Aims C. McGinness, "Governance and Coordination: Definitions and Distinctions" (Denver: ECS Policy Brief, December 2001, accessed 2002 at [http://www.ecs.org/clearinghouse/31/62/3162.htm]), that reinforces the categorization of governing systems used by many observers and draws on the work of Clark Kerr and Marian Gade in *The Guardians: Boards of Trustees of American Colleges and Universities: What Do They Do and How Well Do They Do It?* (Washington, D.C.: AGB, 1989), the AGB publishes a comprehensive database on postsecondary governance structures on its web site. The data available there includes "A report containing all information available in the Postsecondary Governance Structures Database for a single state," "Information on individual topics from all 50 states, where available," and the opportunity to "Select one or more states and specific comparative information to be displayed in a single online report" *ECS Tools & Resources: Postsecondary Governance Structures Database* (Denver: ECS, accessed 2002 at [http: //www.ecs.org/ clearing-

house/31/02/3102.htm]). Aims C. McGinness also has an interesting presentation of organizational diagrams in "Models of Postsecondary Education Coordination and Governance in the States" (Denver: ECS, accessed 2002 at [http://www.ecs.org/clearinghouse/34/23/3423.htm]). J. Fredericks Volkwein demonstrates that "Changes in Quality among Public Universities" is more a function of their resources than a function of their state's regulatory system in his article in the *Journal of Higher Education* (60:2, 1989, 136-151)

Finally, for those interested in the long history and evolution of university organization, *The Academic Corporation: A History of College and University Governing Boards* by Edwin D. Duryea (New York: Falmer Press, 2000) offers a review that begins with "Medieval Origins." This book primarily addresses the powers and legal status of universities private and public and has a thorough discussion of the various significant court cases relevant to this concern. The author looked at the founding documents of 26 private institutions and those of the public universities in 22 states. In addition, there is a very useful bibliography of relevant court cases.

These represent but a sampling of the extensive literature on university governance. While our focus here is on organization, the materials on other topics related to decision making, faculty governance, and other such issues is even more extensive.

The topic of university money, in all its forms, has a large and fascinating academic literature. Economists, education researchers, and many others have explored the topic of university finance from many different directions. Because of the many difficulties of using university-supplied economic data, most of the studies deal with subsets of the academic finance universe. For a quick introduction to the problems of identifying university costs, the report *Explaining College Costs: NACUBO's Methodology For Identifying The Costs of Delivering Undergraduate Education* (Washington, DC: National Association of College and University Business Officers, 2002 accessed on-line July 2002 at [http://www.nacubo.org/public_policy/cost_of_college/final_report.pdf]) provides a good discussion on accounting issues and difficulties of estimating the costs of undergraduate education. It also provides some estimates of cost ranges using its methodology that proved helpful in our work here. Our calculations on endowment payout follow the methodology in Moody's Investors Service, "Moody's Introduces New Concepts to Measure Operating Performance and Leverage" (Special Comment Report, No. 41612) (New York, 1999).

Exceptionally creative work on the issue of instructional costs, pricing, and tuition discounting have come from the Williams Center project mentioned various times in the text. The papers produced on these topics appear on the *The Williams Project on the Economics of Higher Education* web site at [http://www.williams.edu/Mellon/project.html] and accessed in July 2002. Of particular interest is the paper on "Saving, Wealth, Performance, and Revenues in US Colleges and Universities" by Gordon C. Winston, Jared C. Carbone, and Laurie C. Hurshman (Williamstown, MA: *The Williams Project*, 2001), although the entire series of papers on the site are required reading for those interested in the operation of college and university finance. For our purposes in this paper, we have drawn heavily on the framework developed by Winston and colleagues for understanding the institutional competition for high-quality students and applied a similar approach to our understanding of research university competition for research faculty and their grants and contracts. In both cases, the university subsidizes the competition. For students, the mechanism involves tuition discounting and high-cost undergraduate programs and service; for research, the mechanism involves market-competitive salaries and benefits for scarce research-competent faculty and subsidies for the unreimbursed cost of their national research competition for grants, contracts, foundation support, and publication success. Also helpful in formulating this paper is the article mentioned above by Ralph M. Bradburd and Duncan P. Mann, "Wealth in Higher Education Institutions," *Journal of Higher Education* (64,1993; 472-493) and available on-line through JSTOR.

Of considerable utility in this conversation is Irwin Feller's article on "The Determinants of Research Competitiveness Among Universities" in *Albert H. Teich, ed., Competitiveness in Academic Research* (Washington, DC: American Association for the Advancement of Science, 1996, pp. 35-72), where he clearly outlines the importance of institutional and other subsidies that pay for the costs of this competition. Sheila Slaughter and Larry L. Leslie in *Academic Capitalism* (Baltimore: Johns Hopkins University Press, 1997) offer a strong discussion of the impact of externally driven research competition on the internal academic structure and behavior of universities. The focus on faculty incentives and competition also has a long tradition. See, for example, the following two articles that illustrate the clear relationship between research and reward at the individual faculty level. James F. Ragan, Jr., John T. Warren, and Bernt Bratsberg focus on the microcosm of the economics

department in their "How Similar are Pay Structures in `Similar' Departments of Economics?" *Economics of Education Review* (18:1999, 347-360) and demonstrate that high- quality research publication returns high rewards to faculty to compete successfully, further supporting the impact of national guild quality assessment on individual campus faculty and the rewards provided for their research work. James S. Fairweather's "Myths and Realities of Academic Labor Markets," in *The Economics of Education Review* (14:1995, 179-192), looks at the whole of the faculty marketplace and finds that while there is some segmentation of the market by institution type, every institution seeks out research-capable faculty and the price for research talent is nationally determined.

The topic of university revenue and expenditures and institutional finance is an endlessly fascinating and frustrating topic. See, for an example, Daniel T. Layzell's *Budgeting for Higher Education at the State Level: Enigma, Paradox, and Ritual* (Washington, DC: George Washington University, 1990), D. Kent Halstead's *Higher Education Revenues and Expenditures: A Study of Institutional Costs* (Washington, DC: Research Associates of Washington, 1991), and especially the more recent review of the state of the conversation in D. Bruce Johnstone, "Patterns of Finance: Revolution, Evolution, or More of the Same?" *The Review of Higher Education*. (21:1998, 245-255) accessed on-line July 2002 at [http://www.press.jhu.edu/journals/review_of_higher_education/v021/21.3johnstone.html]. The articles in Patrick M. Callan, et al., eds. *Public and Private Financing of Higher Education: Shaping Public Policy for the Future (*Phoenix: Oryx Press, 1997) speak to the complex array of financial resources supporting higher education and make some predictions about the future. An interesting accounting and risk analysis perspective on private university resources is in Ronald E. Salluzzo, Frederic J. Prager, et al., *Ratio Analysis in Higher Education. Measuring Past Performance to Chart Future Direction* (4th ed., n.p., KPMG, LLP and Prager, McCarthy Sealy, LLC, 1999).

Finally, the federal government provides data on institution resources in *Financial Statistics of Institutions of Higher Education; Current Funds, Revenues and Expenditures* (Washington, DC: National Center for Educational Statistics, various dates), but these data are not easily used for the purposes of the kind of discussion presented here. Based on the IPEDS data collection system, the data collection and reporting system create some problems of interpretation, completeness, and consistency that render their usefulness for some purposes problematical. *TheCenter* staff is developing a discussion paper that will address these technical concerns, scheduled for publication in late Fall 2002.

Appendix: Endowment-Equivalent Data and Calculations

Calculations

The following table lists each of the research universities used in our calculation and analysis of endowment-equivalent resources (see Cost, Complexity, Regulation, and Money, pp. 20-22). These 119 institutions (39 private and 80 public) include those with more than $20 million in federal research expenditures in fiscal year 1999, and exclude stand-alone medical schools and any institutions that did not have all five key elements for this study—student enrollment, endowment assets, annual giving, state appropriations, and tuition and fees.

The Total Endowment-Equivalent is the sum of these four variables, with the latter three converted to a comparable endowment-equivalent (i.e., assuming a 4.5% payout rate, we divide each figure by .045):

Endowment Assets Market Value is obtained from the 1999 NACUBO Endowment Study, with adjustments made for single-campus institutions that report as a system or multi-campus university (see Data Notes for further details on adjustments, p. 163).

Annual Giving data are obtained from the Council for Aid to Education's 1999 Voluntary Support of Education Survey, with adjustments if necessary.

State Appropriations data are from the IPEDS 1999 Finance Survey (Form F-1, Line A043, for public universities; Form F-2, Line A041, for privates).

Gross Tuition and Fees data are from the IPEDS 1999 Finance Survey (Form F-1, Line C2d, for public universities; Form F-2, Line A01_1 and AA08, for privates).

The **Adjustment for Student Enrollment** is based on Fall 1999 Student Headcount data reported in IPEDS Fall Enrollment Study (Form EF-1). We use the conventional formula for converting to an FTE Headcount—three part-time students equal one full-time student. We then multiply the FTE headcount by the following estimated baseline costs of education per level:

$7,000 per undergraduate FTE headcount

$8,750 per graduate FTE headcount

$20,000 per professional FTE headcount

The Adjusted Total Endowment-Equivalent is equal to the Total Endowment-Equivalent minus the Adjustment for Student Enrollment.

Endowment-Equivalent Components and Size Adjustment for Selected Over $20 Million Universities*

Control	Institution (In descending order of Adjusted Total Endowment-Equivalent)	1999 Endowment Assets Market Value	1999 Endowment-Equivalent Annual Giving	1999 Endowment-Equivalent State Appropriation	1999 Endowment-Equivalent Tuition & Fees	1999 Total Endowment-Equivalent	Adjustment for 1999 Student Enrollment	1999 Adjusted Total Endowment-Equivalent
Private	Harvard University	14,255,996	10,037,156	-	11,018,356	35,311,507	4,225,829	31,085,679
Public	University of Michigan - Ann Arbor	2,424,588	3,775,844	7,330,982	10,187,931	23,719,345	6,550,455	17,168,890
Private	Stanford University	6,005,211	7,102,000	-	6,429,622	19,536,833	2,771,492	16,765,341
Private	University of Pennsylvania	3,281,342	6,001,356	817,600	10,423,533	20,523,831	3,935,464	16,588,367
Public	University of Minnesota - Twin Cities	1,509,769	3,599,244	11,804,626	5,192,034	22,105,674	6,317,631	15,788,043
Public	University of California - Los Angeles	1,103,038	4,626,756	11,094,156	5,100,067	21,924,016	6,381,320	15,542,696
Private	Columbia University	3,636,621	6,321,933	82,267	8,986,467	19,027,288	3,833,199	15,194,089
Private	Yale University	7,197,900	4,987,622	-	5,042,556	17,228,078	2,234,412	14,993,666
Private	New York University	1,035,900	2,845,422	121,956	16,566,289	20,569,567	5,956,817	14,612,750
Public	University of California - Berkeley	1,654,557	4,094,022	8,775,800	5,199,800	19,724,179	5,179,608	14,544,571
Public	University of Wisconsin - Madison	909,834	5,452,933	8,106,423	5,398,922	19,868,112	6,554,848	13,313,265
Private	Massachusetts Institute of Technology	4,287,701	4,631,933	-	6,074,244	14,993,879	1,784,828	13,209,051
Private	University of Southern California	1,589,833	4,817,422	-	11,713,222	18,120,477	4,911,713	13,208,765
Private	Cornell University	2,869,103	7,585,756	3,946,789	1,692,052	16,093,700	3,687,918	12,405,782
Private	Princeton University	6,469,200	3,535,111	-	3,336,511	13,340,822	1,058,444	12,282,379
Private	Emory University	4,475,755	5,197,778	-	4,750,111	14,423,644	2,146,384	12,277,260
Private	Duke University	1,678,728	7,355,378	-	5,613,733	14,647,839	2,386,840	12,260,999
Public	Texas A&M University	3,596,759	2,746,222	8,372,507	4,218,896	18,934,384	6,816,145	12,118,238
Public	Ohio State University - Columbus	1,086,350	3,409,711	8,534,762	6,610,183	19,641,006	7,656,874	11,984,132
Public	University of Washington - Seattle	745,217	4,683,222	6,361,022	5,141,178	16,930,639	5,667,350	11,263,289
Private	Northwestern University	2,634,850	3,212,222	-	8,092,400	13,939,472	2,925,031	11,014,441
Public	University of North Carolina - Chapel Hill	925,746	3,295,778	8,497,156	2,453,333	15,172,013	4,214,823	10,957,189
Private	Boston University	652,161	1,630,556	-	12,928,870	15,211,586	4,688,758	10,522,828
Private	Johns Hopkins University	1,520,793	4,599,400	310,444	5,953,444	12,384,082	2,222,115	10,161,967
Public	University of Florida	601,813	3,008,644	10,920,000	2,813,356	17,343,813	7,257,706	10,086,107
Public	Pennsylvania State University - University Park	633,748	2,492,467	4,849,373	7,432,956	15,408,544	6,104,893	9,303,652
Private	University of Chicago	2,762,686	2,681,400	-	6,026,163	11,470,249	2,182,466	9,287,782
Public	Michigan State University	265,238	2,314,133	7,625,572	5,268,334	15,473,278	6,459,180	9,014,098
Private	Washington University in St. Louis	3,761,686	2,541,489	-	4,559,444	10,862,619	2,112,252	8,750,367
Private	Vanderbilt University	1,831,766	4,292,956	-	4,482,680	10,607,402	1,945,782	8,661,620
Public	University of California - Davis	300,828	1,182,867	7,714,800	2,969,578	12,168,072	4,190,435	7,977,637
Public	University of Georgia	334,534	945,200	8,938,384	2,545,197	12,763,314	4,914,913	7,848,401
Public	University of Illinois - Urbana-Champaign	522,607	2,344,000	6,652,621	4,315,938	13,835,166	6,146,249	7,688,917
Public	Purdue University - West Lafayette	1,222,411	1,821,422	5,579,954	4,766,477	13,390,265	5,991,567	7,398,698
Public	North Carolina State University	275,532	1,666,644	7,454,916	1,765,839	11,162,932	3,800,595	7,362,337
Public	University of Virginia	1,398,068	2,937,422	3,032,980	3,633,056	11,001,526	3,677,228	7,324,297
Public	University of Arizona	272,950	1,707,533	6,979,589	3,352,310	12,312,382	5,093,684	7,218,698
Public	University of California - San Diego	200,552	2,549,689	5,195,489	2,462,267	10,407,996	3,250,481	7,157,516
Private	University of Notre Dame	1,984,256	2,522,822	-	4,502,689	9,009,767	1,871,367	7,138,400
Public	University of Texas - Austin	1,355,016	2,954,222	5,676,625	4,906,188	14,892,052	7,825,047	7,067,005
Public	University of Maryland - College Park	314,183	1,117,978	6,071,824	3,998,828	11,502,814	4,648,564	6,854,250
Public	University of Pittsburgh - Pittsburgh	854,840	1,457,200	3,515,667	5,176,468	11,004,175	4,194,428	6,809,747
Public	Indiana University - Bloomington	400,000	1,771,533	4,535,531	5,219,659	11,926,723	5,521,501	6,405,222
Public	University of Nebraska - Lincoln	429,991	3,444,444	4,109,991	1,609,964	9,594,390	3,224,713	6,369,678
Public	Georgia Institute of Technology	948,600	1,837,822	4,182,134	1,493,082	8,461,639	2,173,877	6,287,762
Public	University of Kentucky	327,644	1,167,556	6,189,243	2,220,823	9,905,265	3,625,435	6,279,830
Private	Dartmouth College	1,710,585	2,375,400	-	3,048,549	7,134,534	933,974	6,200,561
Private	University of Miami	428,571	1,905,244	354,363	5,893,579	8,581,757	2,562,533	6,019,224
Public	University of Iowa	476,800	1,811,378	5,709,796	2,732,211	10,730,184	4,798,362	5,931,823
Private	George Washington University	673,589	978,200	-	7,088,455	8,740,244	3,124,712	5,615,533

Endowment-Equivalent Components and Size Adjustment for Selected Over $20 Million Universities* *(cont.)*

Control	Institution (In descending order of Adjusted Total Endowment-Equivalent)	1999 Endowment Assets Market Value	1999 Endowment-Equivalent Annual Giving	1999 Endowment-Equivalent State Appropriation	1999 Endowment-Equivalent Tuition & Fees	1999 Total Endowment-Equivalent	Adjustment for 1999 Student Enrollment	1999 Adjusted Total Endowment-Equivalent
Public	Iowa State University	266,348	1,099,778	5,834,442	2,282,133	9,482,700	3,893,219	5,589,481
Public	Virginia Polytechnic Institute and State University	340,244	1,586,067	4,512,065	3,431,155	9,869,531	4,287,326	5,582,205
Public	Temple University	141,527	986,333	3,544,156	5,017,133	9,689,149	4,286,664	5,402,485
Private	Brown University	1,181,514	1,668,667	1,667	3,804,467	6,656,314	1,301,883	5,354,431
Private	Rice University	2,936,622	1,741,378	-	1,362,911	6,040,911	707,455	5,333,456
Public	University of Utah	269,430	2,789,867	4,015,022	1,602,733	8,677,052	3,366,438	5,310,614
Private	Syracuse University	641,466	748,511	49,720	6,573,796	8,013,493	2,797,378	5,216,115
Public	University of Illinois - Chicago	106,154	781,333	5,867,337	2,406,764	9,161,588	4,073,425	5,088,163
Public	University of Connecticut - Storrs	100,019	523,356	4,737,372	2,460,946	7,821,692	2,771,511	5,050,181
Public	University of Cincinnati - Cincinnati	898,976	905,889	3,839,337	3,259,991	8,904,193	3,891,731	5,012,462
Private	Georgetown University	684,193	1,823,956	-	5,084,778	7,592,926	2,660,972	4,931,954
Public	University at Buffalo	438,002	372,422	5,749,837	2,224,756	8,785,017	3,872,596	4,912,421
Private	California Institute of Technology	1,333,229	3,068,689	-	752,400	5,154,318	332,033	4,822,285
Private	Case Western Reserve University	1,434,200	1,674,267	117,556	3,209,244	6,435,267	1,681,988	4,753,279
Public	University of Missouri - Columbia	350,319	897,133	4,114,272	3,024,866	8,386,590	3,653,738	4,732,852
Public	University of Delaware	777,349	891,267	1,996,371	4,034,428	7,699,415	2,968,426	4,730,989
Public	Indiana University-Purdue University - Indianapolis	350,000	1,594,400	4,091,212	2,319,584	8,355,196	3,628,765	4,726,431
Public	Arizona State University - Tempe	183,440	1,035,778	5,717,422	3,804,333	10,740,973	6,029,743	4,711,231
Public	University of Massachusetts - Amherst	60,579	428,178	4,462,400	3,055,356	8,006,512	3,503,666	4,502,846
Public	Wayne State University	146,275	760,444	5,143,921	2,329,759	8,380,400	3,963,536	4,416,864
Public	University of California - Irvine	100,276	1,078,778	3,929,422	2,405,822	7,514,298	3,115,880	4,398,419
Private	University of Rochester	1,119,027	1,073,800	32,156	3,494,844	5,719,827	1,348,488	4,371,339
Public	Washington State University - Pullman	421,402	916,444	3,806,648	2,248,787	7,393,281	3,094,051	4,299,230
Private	Northeastern University	396,205	628,178	-	6,349,546	7,373,929	3,080,704	4,293,225
Public	University of Tennessee - Knoxville	151,240	947,289	4,885,746	2,280,498	8,264,773	4,011,225	4,253,548
Private	Tufts University	464,107	1,167,889	116,111	4,280,619	6,028,726	1,923,293	4,105,433
Private	Carnegie Mellon University	719,320	906,978	-	3,776,335	5,402,633	1,311,896	4,090,737
Private	Tulane University	548,305	1,337,778	26,733	4,261,622	6,174,438	2,097,321	4,077,117
Public	Clemson University	214,566	740,311	3,614,423	1,925,353	6,494,653	2,480,236	4,014,417
Public	University of South Florida	202,784	437,644	5,944,343	1,468,667	8,053,439	4,069,261	3,984,177
Public	University of South Carolina - Columbia	253,775	1,120,822	3,560,904	2,591,833	7,527,334	3,552,428	3,974,906
Public	University of Alabama - Birmingham	204,680	846,556	3,694,341	1,313,618	6,059,194	2,234,229	3,824,965
Public	University at Stony Brook	22,383	257,400	4,478,928	1,695,649	6,454,360	2,792,290	3,662,070
Public	University of Kansas - Lawrence	613,338	1,438,600	2,735,259	2,426,281	7,213,478	3,660,577	3,552,901
Public	Auburn University - Auburn	233,049	842,467	3,733,182	2,114,228	6,922,925	3,401,334	3,521,592
Public	West Virginia University	254,576	624,178	3,948,834	2,114,047	6,941,635	3,502,438	3,439,197
Public	Florida State University	247,471	1,211,111	4,724,683	1,999,718	8,182,983	4,805,880	3,377,103
Public	University of Hawaii - Manoa	146,459	298,911	3,874,512	1,508,100	5,827,982	2,460,014	3,367,968
Private	Wake Forest University	857,938	1,047,978	35,156	2,557,988	4,499,060	1,202,247	3,296,813
Public	Louisiana State University - Baton Rouge	176,925	855,556	4,622,370	2,278,580	7,933,431	4,827,557	3,105,874
Public	Oregon State University	241,973	910,178	2,575,223	1,749,047	5,476,420	2,414,946	3,061,474
Public	Oklahoma State University - Stillwater	156,074	779,733	3,642,316	1,355,365	5,933,488	2,879,380	3,054,107
Private	Saint Louis University - St. Louis	907,822	670,267	-	3,373,534	4,951,623	1,951,319	3,000,304
Public	University of Colorado - Boulder	195,585	1,152,733	1,658,484	4,047,063	7,053,865	4,077,690	2,976,175
Public	University of California - Santa Barbara	100,276	431,889	3,516,889	2,028,800	6,077,854	3,128,705	2,949,149
Public	Texas Tech University	197,532	1,344,178	2,945,039	2,024,881	6,511,630	3,670,800	2,840,830
Public	Virginia Commonwealth University	200,793	611,267	3,264,124	2,040,229	6,116,413	3,294,524	2,821,889
Public	University of New Mexico - Albuquerque	193,377	562,356	4,084,286	1,221,062	6,061,080	3,317,046	2,744,033
Public	Mississippi State University	160,399	585,000	3,000,404	1,287,907	5,033,710	2,291,251	2,742,459
Private	Rensselaer Polytechnic Institute	516,238	810,356	19,622	2,503,622	3,849,838	1,118,000	2,731,838

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