‘Privileging’ Public Research Universities: 
An Empirical Analysis of the Distribution of State 
Appropriations Across Research and Non-Research 
Universities* 

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and William Doyle, Ph.D.

A B S T R A C T

No empirical studies have attempted to explain why states invest differentially in 
their research and in their non-research universities, although these differences 
hold important implications for students, postsecondary systems, and society. Deploying a form of hierarchical-linear modeling, our study examines across-
state variation in state appropriations allocated to public four-year universities, 
and the distribution of these appropriations to Carnegie research universities 
relative to other non-research universities. The analysis suggests that a primary 
reason why some states “privilege” their research universities is because the re-
search universities in these states tend to engage in more expensive types of ac-
tivities than do their non-research counterparts. Our analysis, however, points 
also to certain political influences that tend disproportionately to benefit research 
universities, including the proportion of appropriations committee members in 
a state legislature that graduated from the institution. These findings evidence 
the need for a closer examination of the link between state-policy outputs in 
higher education, the characteristics of legislative committees and of the indi-
viduals who serve on them.

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INTRODUCTION

In recent decades, state legislatures across the nation have responded to new economic, demographic, and political pressures by altering the level of public financial support of higher education (Ehrenberg 2005, Heller 2006, Lyall and Sell 2005, McLendon and Mokher in press). State appropriations to higher education have become a smaller proportion of institutional revenues as public colleges and universities have faced increasing competition for scarce governmental funding. This competition is occurring between public higher education and other budgetary areas such as K-12 education and health care (Doyle and Delaney 2007; Kane, Orszag and Apostolov 2005), yet in many states the competition appears also to be occurring within the public higher education sector between different types of postsecondary institutions.

In fact, there is considerable variation across states in the relative distribution of appropriations to public research universities and other public four-year colleges (see Figure 1). In some states, as in Virginia and Mississippi, there is no statistically significant difference in appropriations per FTE to universities by Carnegie classification status. Elsewhere, as in Minnesota and Utah, research universities may receive up to three times more funding per FTE than other public four-year universities in the state (based on authors’ calculations using IPEDS data).

Figure 1. Appropriations per FTE to public four-year colleges, by Carnegie research university status

![Graph showing appropriations per FTE to public four-year colleges, by Carnegie research university status](image-url)
These differences in state spending on research and on non-research universities hold important implications for students, higher education systems, and society. Because each $1,000 of state appropriations per FTE is associated with a one percentage point increase in graduation rates among research/doctoral, masters, and baccalaureate institutions (Zhang 2006), variation in state investment across the different kinds of public universities may differentially impact the missions, purposes, and clienteles that these institutions serve. In particular, the distribution of state resources has important social implications for equity, since the opportunity to attend selective public institutions is not available to all students (Doyle 2007).

Such variation in state investment also raises important conceptual questions about the forces that shape governmental behavior in the allocation of scarce public resources to higher education. What factors lead states to invest, and to invest at different levels, in their public institutions of higher education? These questions are, at present, poorly understood. Indeed, while numerous studies have examined the determinants of overall state funding for higher education (Archibald and Feldman 2006; Clotfelter 1976; Coughlin and Erekson 1986; Lowry 2001; McLendon, Hearn and Mokher 2006; Okunade 2004; Rizzo 2004; Toutkoushian and Hollis 1998), none of the extant research has attempted to explain why state legislatures may unevenly distribute appropriations to different types of institutions within each state.

This article reports the results of an examination of across-state variation in the level of state appropriations allocated to public four-year universities, and the distribution of these appropriations within each state to research universities relative to non-research universities, in the 2003–04 academic year. Deploying a newer methodological technique, we address two questions: First, what characteristics of states and of institutions influence the level of appropriations that a public four-year university receives? Second, why do some states tend to “privilege” their research universities by allocating to them greater appropriations per FTE relative to other public universities in the state—alternatively, why do some states allocate appropriations more equitably across all institutions?

The remainder of the article reports on an analysis of these questions. We first develop a conceptual framework that melds literature in three areas: postsecondary finance and governance, political economy, and comparative state politics. Next, we describe the sample and data we used to examine the influence on state appropriations of certain socio-demographic, economic, organizational, and political conditions. We then introduce and describe our methodological approach—a form of hierarchical linear modeling that is gaining currency in political science for the kinds of questions as we posed above. Lastly, we present the results of the analysis, which in important respects confirm and diverge
from our hypothesized findings, and discuss the implications of some of those findings.

CONCEPTUAL FRAMEWORK AND STUDY HYPOTHESES

Since the 1970s, numerous empirical studies have examined the determinants of state funding for higher education. These studies have pursued a variety of operationalized outcomes, including total-state appropriations for higher education (Leslie and Ramey 1986, Toutkoushian and Hollis 1998); the percentage of the state budget allocated to higher education (Doyle 2007, Doyle and Delaney 2007, Okunade 2004, Rizzo 2004); state appropriations per full-time equivalent (FTE) student; state appropriations per capita (Clotfelter 1976, Nicholson-Crotty and Meier 2003); and state funding effort (i.e., funding relative to personal income) for higher education (Archibald and Feldman 2006; McLendon, Hearn and Mokher in press). Studies such as these have assayed the funding impacts of a variety of economic, demographic, postsecondary-organizational, and political characteristics.

First, in terms of economic-related influences, research indicates that states tend to spend more money on higher education when the state is facing favorable fiscal conditions and thus possesses greater levels of financial resources. For example, greater state wealth is positively associated with state higher-education spending (Humphreys 2000, Koshal and Koshal 2000, Lowry 2001), while unemployment levels are negatively associated with state appropriations for higher education (Kane, Orszag and Apostolov 2005; Toutkoushian and Hollis 1998). Research also shows that state demography can influence funding for higher education by shaping the demand for these services. The size of the total population and the proportion of the population consisting of traditional college-age students often are associated with greater total spending for higher education (Toutkoushian and Hollis 1998, Weerts and Ronca 2007), but with less spending per FTE as state governments have often been unable to keep pace with the escalating growth in demand (Peterson 1976, Rizzo 2004).

Next, certain postsecondary characteristics at both the state level and at the level of the individual institution have been found to influence state spending on higher education. At the level of the state, some studies have shown a strong positive relationship between student enrollment and total-state spending for higher education (Leslie and Ramey 1986, Toutkoushian and Hollis 1998). Several studies have identified a negative relationship between the size of the private sector of higher education and state appropriations for higher education (Goldin and Katz 1998, Lowry 2001). States with greater capacity in the private higher-education sector can divert more of the state's demand for higher educa-
tion to that sector, while permitting public institutions to charge higher levels of tuition and yet remain competitive with the tuition prices charged by their private, in-state counterparts. At the institution level, a positive relationship has been found between state appropriations and certain research activities, as well as various measures of institutional quality (Coughlin and Erekson 1986, Lowry 2001, Weerts and Ronca 2007).

A more recent line of work has pointed to state political systems and to the influence that variation in political systems plays in determining funding outcomes for higher education. Because the state budget is a product of political negotiation, it is unsurprising that certain political institutions and conditions within a given state could conceivably influence state-budget outcomes. Partisanship is the most commonly-cited political influence, with democratic governors and legislators tending to allocate more funds to higher education than Republicans (Archibald and Feldman 2006, Koshal and Koshal 2000, Okunade 2004). Several recent longitudinal studies have found state funding effort for higher education associated with factors such as partisan control of the legislature, legislative professionalism, and term limits (McLendon, Hearn and Mokher, 2006; Nicholson-Crotty and Meier 2003; Tandberg, 2007).

Although to date there have been no empirical analyses of the distribution of state appropriations to different types of institutions, the preceding literature serves as a useful starting point in our speculating on the factors that may influence state investment in the different kinds of public universities. In addition to the research previously cited, our conceptualizing draws on three related strands of literature: (1) literature on state finance and governance of higher education (Archibald and Feldman 2006; Doyle and Delaney 2007; Kane, Orszag and Apostolov 2005; McLendon, Hearn and Deaton, 2006; Okunade 2004; Toutkoushian and Hollis, 1998); (2) literature on political economy (e.g., Alt and Lowry 2000, Lowry 2001, Payne 2003); and, (3) the broader literature on determinants of public policies in the American states (e.g., Barrilleaux, Holbrook and Langer, 2002; Squire and Hamm 2005).

From these different veins of scholarship, we distill 16 hypothesized influences on state funding of four-year public universities. These influences include: (1) institutional student characteristics, (2) institutional political characteristics, (3) state political-system characteristics, (4) economic and demographic conditions of states, and (5) postsecondary governance and policy conditions of states.

**Institutional Student Characteristics**

The first set of influences include institutional student characteristics, taking into account factors that might make some institutions inherently more expen-
sive to operate than others based on the types of students that they serve. One of the reasons why some states may spend more on their research universities is that these institutions may be involved in more expensive activities than the research universities in other states. For example, *graduate education* tends to be more expensive to provide than undergraduate education. Some of the reasons for this difference in cost may include smaller student-teacher ratios in graduate education, courses with fewer teaching assistants or adjunct faculty with lower salaries, and higher expenditures on research activities and facilities (Ehrenberg 2000, James 1978). These differences lead us to hypothesize that the proportion of graduate enrollments at an institution will be positively associated with appropriations per FTE, and that states with large graduate enrollments in their research universities will have a less equitable distribution of resources among research and non-research universities.

Some public universities also may be able to attract a broader group of applicants from out-of-state than other institutions. These *non-resident students* typically pay higher out-of-state tuition costs than do state residents, so they receive a relatively lower subsidy toward the net cost of attendance. State policymakers, when weighing possible choices about the allocation of scarce public resources, may conclude that institutions that receive robust tuition revenues from non-resident students may not require as much state funding. Hence, the proportion of undergraduate enrollments from non-resident students at an institution will be negatively associated with appropriations per FTE, while states with large non-resident enrollments in their research universities will provide relatively less funding to their research universities.

Institutions may also face varying costs associated with the different types of educational programs they offer. In particular, courses in *STEM fields* (science, technology, engineering, and mathematics) tend be more resource-intensive than courses in areas such as humanities and social sciences, because the former commonly require investments in labs and in additional high-cost technology-related resources (Ehrenberg 2000). We conjecture that the proportion of completions in STEM majors at a university will be positively associated with appropriations per FTE, and that states with more overall STEM completions in their research universities will provide relatively more funding to their research universities.

**Institutional Political Characteristics**

In addition to the student characteristics listed above, there may be other characteristics at the institution level that contribute to the level of appropriations that an institution receives. In particular, some institutions may have more influence
in the state budget process because of the relationships they enjoy with elected officials. We examine the impact on funding distribution of three such factors rarely before studied: (1) the university’s geographic proximity to the state capital, (2) the alumni affiliations of governors, and (3) the alumni affiliations of legislators serving on appropriations committees.

First, institutions located in the state capital may have an advantage in the appropriations process because their physical proximity to the state capital may foster more frequent, intensive and, ultimately, effective lobbying of elected officials. For this reason, we believe, universities located in the state capital will receive greater appropriations per FTE than universities located in other cities, while states in which research universities are concentrated in the state capital will provide relatively more funding to their research universities.

In addition, some institutions may benefit from the fact that the state’s governor is an alumnus of the institution. Governors play a crucial role in the state-budget cycle. While there is case-study evidence suggesting that some governors may seek to “privilege” universities with which they hold close ties (Gittell and Kleiman, 2000), previous studies have not rigorously examined these relationships. Building on the political-economy perspective introduced by Payne (2003), in her study of federal earmarks to higher education, we propose that a governor’s personal preferences and interests, including his or her alma mater affiliation, may influence his or her higher education-related budget priorities. The personal affinity of governors for the universities from which they graduated will impact state spending in two ways: A public university will receive greater levels of appropriations per FTE if the governor is a graduate of the institution, while states whose governors attended a public research university will have a less equitable distribution of resources among research and non-research universities.

Legislators, too, may privilege the institutions with which they are personally tied. As scholars have noted, legislators’ actions may be driven by an interest to represent their constituents or by personal considerations or both (e.g., Clucas 2003; Moncrief, Thompson and Cassie 1996; Peltzman 1976). In many instances, the legislator’s behavior is likely to stem from lobbying by a person or an institution that would benefit from the actions taken by the legislator (Payne 2003). Although the empirical evidence is scarce, a number of case studies suggest that one source of legislative lobbying is that of colleges and universities attempting to influence elected officials who are graduates of their institutions (e.g., Gittell and Kleiman 2000, Peterson and McLendon 1998, Schmidt 2004). The purported goal of lobbying efforts by campuses often involves some form of financial favoritism, typically during the appropriations process. We conjecture that the more alumni representation that an institution has on the appropriations committees of its state legislature, the higher the level of state support to that insti-
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Additionally, states that have larger numbers of graduates of public research universities serving on appropriations committees will distribute resources between the university sectors less equitably.

State Political-System Characteristics

Beyond the level of the individual institution, there are characteristics of the state political system that may influence state appropriations for public universities. First, the two primary political parties, Democrat and Republican, tend to have different preferences regarding the size of state government and spending on social services (Alt and Lowry 2000). Because some previous studies have found that Democrats tend to be associated with greater levels of funding for higher education (Archibald and Feldman 2006, Koshal and Koshal 2000, Okunade 2004), we hypothesize that the proportion of Democratic legislators in a state will be positively associated with appropriations per FTE. Additionally, Democrats’ share of state legislative seats peaked roughly at the same time as the rapid growth in many states of the less research-intensive, regional-public university. We posit therefore that Democrats may have more personal ties and greater incentive to maintain funding at these non-research universities and, thus, the proportion of Democratic legislators will be associated with a more equitable distribution of resources between research and non-research universities in a state.

States also vary in the ideological predisposition of their citizenries (Berry et al. 1998). Historically, states with more liberal citizenries have supported more generous public spending on social services and bigger government, overall (Barrilleaux, Holbrook and Langer 2002). Some recent research finds that states whose citizens are more liberal tend also to fund higher education at higher levels (Archibald and Feldman 2006; McLendon, Hearn and Mokher 2006; Nicholson-Crotty and Meier 2003). Institutions that are located in states with more liberal citizenries, we hypothesize, will tend to receive greater appropriations per FTE. Since more liberal citizenries tend to support more generously-subsidized social services, they may also be stronger advocates of providing broad access to higher education. Non-research universities are accessible to a broader range of students than research universities, which are often viewed as more exclusive, so states with more liberal citizenries may also distribute funding more equitably between the university sectors.

A third characteristic of state political systems that may influence patterns of state investment in public higher education is term limits of state elected officials. Because term limits have typically been viewed as a mechanism for imposing fiscal discipline on legislatures by facilitating the election of legislators believed to favor more limited government (Carey, Niemi and Powell 2001), we surmise
that states whose legislators are term-limited will fund higher education at relatively lower levels. States with term limits will also fund research and non-research universities more equitably. Anecdotal and case-study evidence has sometimes pointed to research universities as being protected by legislative “patron saints”—legislators who, over time, used their influence to shield the universities’ financial interests. The imposition of term limits undermines this “iron triangle” of political patronage, thus funding is likely to be more equitably distributed across universities in states that practice term limitation.

Turning to organizational characteristics of legislatures, professionalism represents the degree of institutional resources (full-time staff, session length, and member pay) that are available to aid a legislature in its deliberation and lawmaking. Professionalism has been linked empirically with higher-public spending (Squire and Hamm 2005), including higher levels of state funding for higher education (Nicholson-Crotty and Meier 2003, Tandberg 2007). Drawing on this stream of scholarship, we hypothesize that institutions located in states with more professionalized legislatures will tend to receive greater appropriations per FTE. Additionally, because professionalism enhances the informational and the analytical capacities of a legislature, which are needed to monitor any funding inequities and to develop ameliorative strategies, we hypothesize that funding inequity between research and non-research universities will be lower in states whose legislatures are professionalized.

The formal institutional powers of governors may also influence a state’s level of investment in higher education. Governors’ budget powers, which vary considerably across the states, are likely to influence public spending on higher education in at least two respects. First, because most governors are responsible for achieving a balanced budget and therefore have incentives for minimizing the cost of public services, universities that are located in states whose governors possess strong budgetary powers will tend to receive lower appropriations per FTE. Second, because governors are responsible for meeting the needs of a broad base of constituents throughout their state, they also have an incentive for allocating funds more equitably across institutions. Appropriations, we believe, will be allocated more equitably among research and non-research universities in states whose governors have strong budgetary powers.

**Economic & Demographic Conditions of States**

Economic conditions of states, particularly income and employment levels, may influence appropriations to public universities because of their implications for state-resource capacity. A substantial body of research, for example, indicates that states with higher per capita income tend to have greater tax revenues
available to fund public services, including higher education (Humphreys 2000, Lowry 2001). Hence, average per capita income in a state will be positively associated with appropriations per FTE. Additionally, because greater resource capacity is likely a precondition for remedying funding inequities, we surmise that wealthier states will exhibit a more equitable distribution of appropriations to the two university sectors.

The level of state appropriations for higher education also may be influenced by state demography, which can shape the demand for postsecondary education in a given locale. In states with large populations of traditional college-age citizens, enrollment in postsecondary education is likely to be high, making it more difficult for the state to provide large-student subsidies. Thus, the proportion of the population aged 18 to 24 in a state will be negatively associated with appropriations per FTE. Because much of the increase in college enrollment in recent decades has been absorbed by non-research universities (National Center 2004), we surmise that appropriations will be more equitably distributed in states that have a higher proportion of the population aged 18–24.

Postsecondary Characteristics of States

Our final category of influences involves certain governance, policy, and organizational conditions of state postsecondary educational systems. First, we turn our attention to state governance arrangements for higher education. Statewide systems for governing public higher education vary in their authority and responsibilities. On one end of the governance continuum are coordinating boards, which provide oversight of public institutions within a state, but do not directly govern them. On the other end of the continuum are so-called consolidated governing boards, which possess centralized powers of management over one or more state systems of postsecondary education (McGuinness 1997; McLendon, Hearn and Deaton 2006). Because coordinating boards tend to be administratively weaker and politically more fragile, they are sometimes viewed as having less influence in the appropriations process (Lowry 2001, Tandberg 2007). Therefore, universities located in states that have coordinating boards will receive relatively lower levels of appropriations per FTE than institutions in states with other types of postsecondary governance structures. Some research, however, suggests that consolidated governance systems effectively function as cartels, protecting the interests of research universities, which tend to dominate these systems (e.g., Zumeta 1992). By extension, we reason that public funding of universities will be more equitably distributed in states that practice the coordinating-board model of postsecondary governance than in ones with consolidated boards.
One other policy condition of states that may influence appropriations outcomes is the use of funding formulas. Some states use funding formulas in the higher-education budget process to allocate appropriations to institutions based on indicators such as enrollments or benchmarks from peer institutions. States first implemented funding formulas (1) to help rationalize state support of higher education and (2) to accomplish the purpose of providing for a more equitable distribution of available funds after accounting for differences in student characteristics (Layzell and Lyddon 1990; McKeown-Moak 1999, 2007). Thus, appropriations to higher education will be higher overall and more equitably distributed in states that use funding formulas in the budget process.

Finally, state appropriations may be influenced by the size of a state’s private sector of higher education. States that rely on the private sector to meet demand for higher education because of capacity or fiscal constraints may disadvantage private institutions if the subsidy to public universities grows too large. Thus, states with larger private-sector enrollments are likely to provide a lower relative level of public support to public universities (Goldin and Katz 1998, Lowry 2001). In addition, public universities in states with a large private sector can generally charge higher levels of tuition, while still remaining competitive on price, allowing them to generate greater revenues from tuition (Rizzo and Ehrenberg 2004, Toma 1990, Zumeta 1992). For both of these reasons we conjecture that the proportion of higher education enrollments from the private sector in a state will be negatively associated with appropriations per FTE. Because non-research universities compete mainly on cost and convenience, they already have a cost advantage over private institutions. A state with many private institutions, therefore, may choose to fund its research universities at levels higher than those of its non-research universities so that the research institutions have more resources available to compete with private universities on quality issues (e.g., attracting top students and faculty). Thus, we surmise that states with larger private-sector enrollments will fund public universities less equitably.

DATA

The initial sample for our study included 534 public four-year universities in the 2003–04 academic year found in the Integrated Postsecondary Education Data System (IPEDS) data collection program of the National Center for Education Statistics (NCES).¹ Using listwise deletion, a total of 33 institutions were excluded due to missing data, resulting in a final sample size of 501 institutions in 46 states.² This final sample consisted of 155 institutions classified as Carnegie doctoral or research (extensive and intensive) universities (hereafter referred to as research universities) and 379 other non-research universities, primarily
consisting of master’s and baccalaureate colleges. Each state had at least one research university and one other non-research university, except for the state of Wyoming, where the University of Wyoming is the only public four-year institution. Institutions under the Carnegie classification codes of hospital schools, health profession schools, and other specialized institutions were omitted from the analysis.3

Because our analysis examines appropriations decisions made by states in 2003, all of the data for the dependent variables in our study have values from 2003, since they represent the characteristics of states and institutions at the time in which these funding decisions were made.4 Table 1 provides a list of all of the variables used in the analysis and the sources of data for each of these variables.5 The dependent variable of state appropriations per FTE (full-time equivalent student) was calculated for each public four-year institution using data on state and local appropriations for current operating expenses from the 2004 IPEDS finance survey and FTE data from the 2004 IPEDS institutional characteristics survey as follows: (State Appropriations + Local Appropriations) / FTE. The value of this dependent variable was logged to reflect a normal distribution.

The independent variables in our study can be categorized as one of two types—institution-level variables and state-level variables. Most of the independent variables at the level of the individual institution (i.e., the universities contained in our sample) were taken from the 2003 IPEDS surveys on institutional characteristics, finance, and enrollment (see Table 1). Most of the data for the state-level independent variables were drawn from a variety of reliable secondary sources, including the Bureau of Economic Analysis (e.g., data on per capita income), the Inter-University Consortium for Political and Social Research (e.g., citizen ideology), and the National Conference on State Legislatures (e.g., term limits of state legislators). Data on party strength in state legislatures were taken from datasets publicly available at the online archive of the State Politics and Policy Quarterly.

Several of the variables used in the analysis, notably the political-representation data, are unique to this study. For each of the 501 universities in our dataset, we collected two forms of data on the representational attributes of universities. First, for each university in our dataset, we coded whether its state’s governor had graduated with a bachelor’s degree from that institution. Second, for each of the universities, we coded the proportion of members of appropriations committees in both the upper and lower chambers of the state legislature who had graduated with a bachelor’s degree from that institution.6 For the biographical information on governors and state legislators, we hand-collected data from several sources. For governors, we consulted individual state “Blue Books” and various on-line resources including the biographical sketches of chief executives
Table 1. Definitions and sources of variables used in the analysis.

<table>
<thead>
<tr>
<th>Variable Definition</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variable</strong></td>
<td></td>
</tr>
<tr>
<td>State appropriations per FTE (logged)</td>
<td>IPEDS Finance &amp; Institutional Characteristics Survey (derived)</td>
</tr>
<tr>
<td><strong>Institution level variables</strong></td>
<td></td>
</tr>
<tr>
<td>Institution type (1=Carnegie research university, 0=non-research university)</td>
<td>IPEDS Institutional Characteristics Survey</td>
</tr>
<tr>
<td>Proportion of total enrollment from graduate students</td>
<td>IPEDS Enrollment Survey (derived)</td>
</tr>
<tr>
<td>Proportion of enrollment from non-residents (undergraduate)</td>
<td>IPEDS Enrollment Survey (derived)</td>
</tr>
<tr>
<td>Proportion of completions in STEM fields</td>
<td>IPEDS Completions Survey</td>
</tr>
<tr>
<td>Institution is located in the state capital (1=yes, 0=no)</td>
<td>Book of the States (author's calculations)</td>
</tr>
<tr>
<td>Governor graduated from the institution (1=yes, 0=no)</td>
<td>Archival research conducted by authors</td>
</tr>
<tr>
<td>Proportion of legislative appropriations committee members that graduated from the institution</td>
<td>Archival research conducted by authors</td>
</tr>
<tr>
<td><strong>State level variables</strong></td>
<td></td>
</tr>
<tr>
<td>Proportion of legislators who are Democrats</td>
<td>Klarner data at State Politics and Policy Quarterly (SPPQ) data archive</td>
</tr>
<tr>
<td>Citizen ideology</td>
<td>Berry data from the Inter-University Consortium for Political &amp; Social Research (ICPSR)</td>
</tr>
<tr>
<td>Term limits (1=yes, 0=no)</td>
<td>National Conference of State Legislatures (NCSL) and other sources</td>
</tr>
<tr>
<td>Legislative professionalism</td>
<td>Squire, 2007</td>
</tr>
<tr>
<td>Gubernatorial budgetary power</td>
<td>Thad Beyle - University of North Carolina at Chapel Hill (<a href="http://www.unc.edu/~beyle/">http://www.unc.edu/~beyle/</a>)</td>
</tr>
<tr>
<td>Per capita income (logged)</td>
<td>Bureau of Economic Analysis/ Southern Regional Education Board</td>
</tr>
<tr>
<td>Proportion of the population aged 18–24</td>
<td>Southern Regional Education Board (SREB) Data Library (U.S. Census) (<a href="http://www.sreb.org/main/EdData/DataLibrary/datalibindex.asp">http://www.sreb.org/main/EdData/DataLibrary/datalibindex.asp</a>)</td>
</tr>
<tr>
<td>Governance structure (1=Coordinating boards with strong budget authority, 0=other)</td>
<td>McGuiness’ State Structures Handbook and Education Commission of the States (ECS)</td>
</tr>
<tr>
<td>State uses formula funding (1=yes, 0=no)</td>
<td>State Higher Education Executive Officers (SHEEO, 2007); personal communication with Mary McKeown-Moak</td>
</tr>
<tr>
<td>Proportion of higher education enrollments in private institutions</td>
<td>SREB Data Library (National Center for Education Statistics)</td>
</tr>
</tbody>
</table>
available at the National Governors Association. Locating similar data on state legislators required a more labor-intensive set of procedures. First, via phone calls to the clerks’ offices of the 92 legislative chambers included in our sample, we obtained the membership rosters of the committees in 2003, whose duties included appropriating funds to public colleges and universities.\(^7\) Once we had identified the names of legislators serving on the appropriate committees, we collected needed biographical information from a variety of data sources. The data sources included state legislative websites, print versions of legislative committee rosters found in state archives, electronic newspaper archives (e.g., Lexis-Nexis Academic), and online sources, such as Project Vote Smart—an electronic political research organization. We also placed phone calls to state archivists and legislative clerks in an effort to triangulate information gleaned from the print and online data sources.

Table 2 provides the mean and the standard deviation of each variable for the subsets of research and non-research universities. Research universities have higher proportions of enrollment from graduate students, higher proportions of completions in STEM\(^8\) fields, and were more likely to be located in the state capital (12% compared to 6% of non-research universities). In addition, research universities were more likely to have a state governor that graduated from the institution (8% compared to 1% of non-research universities) and a higher percentage of legislative appropriations committee members that graduated from the institution (10% compared to less than 2% of non-research universities).

**METHODS**

Both the nature of our research questions and the structure of our data presented us with a notable dilemma. As we have argued, differences in the distribution of state appropriation to universities across states conceivably could be attributable to certain institution-level characteristics, such as the proportion of enrollments from graduate students, as well as certain state-level characteristics like per capita income. However, in a multi-level model, the individual characteristics may be correlated with the group effects from the states. For example, states with higher per capita income may also have higher levels of graduate student enrollment in their research universities, and these two interrelated factors may help to explain why some states appropriate relatively more money to certain institutions (i.e., research universities). If one does not account for this potential correlation in the statistical modeling, the relationship would be absorbed into the error term. This is problematic because correlations between institution-level predictors and group effects violate an important Gauss-Markov assumption, which could introduce uncertainty into the parameter estimates or bias (Bafumi and Gelman...
Table 2. Mean and standard deviation for all variables by Carnegie research university status for the 534 institutions in the sample (2003–04 academic year)

<table>
<thead>
<tr>
<th>Variable Definition</th>
<th>Carnegie Research Univ. (n=155)</th>
<th>Non-Research University (n=379)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variable</strong></td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>State appropriations per FTE (logged)</td>
<td>8.93</td>
<td>0.42</td>
</tr>
<tr>
<td><strong>Institution level variables</strong></td>
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<td></td>
</tr>
<tr>
<td>Carnegie research university (1=yes, 0=other)</td>
<td>1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Proportion of total enrollment from graduate students</td>
<td>0.17</td>
<td>0.09</td>
</tr>
<tr>
<td>Proportion of enrollment from non-residents (undergraduate)</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>Proportion of completions in STEM fields</td>
<td>0.36</td>
<td>0.14</td>
</tr>
<tr>
<td>Institution is located in the state capital (1=yes, 0=no)</td>
<td>0.12</td>
<td>0.32</td>
</tr>
<tr>
<td>Governor graduated from the institution (1=yes, 0=no)</td>
<td>0.08</td>
<td>0.28</td>
</tr>
<tr>
<td>Proportion of legislative appropriations committee members that graduated from the institution</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td><strong>State level variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of legislators who are Democrats</td>
<td>0.49</td>
<td>0.13</td>
</tr>
<tr>
<td>Citizen ideology</td>
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<td>12.09</td>
</tr>
<tr>
<td>Term limits (1=yes, 0=no)</td>
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<tr>
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</tr>
<tr>
<td>Gubernatorial budgetary power</td>
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</tr>
<tr>
<td>Per capita income (logged)</td>
<td>10.34</td>
<td>0.12</td>
</tr>
<tr>
<td>Proportion of the population aged 18-24</td>
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<td>0.01</td>
</tr>
<tr>
<td>Coordinating board with strong budget authority (1=yes, 0=other)</td>
<td>0.41</td>
<td>0.49</td>
</tr>
<tr>
<td>State uses formula funding (1=yes, 0=no)</td>
<td>0.68</td>
<td>0.47</td>
</tr>
<tr>
<td>Proportion of higher education enrollments in private institutions</td>
<td>0.21</td>
<td>0.10</td>
</tr>
</tbody>
</table>
A common solution to this problem of correlation within multi-level modeling has been to include in the model fixed effects for the group, such as states. This approach, however, fails to provide any information about variation across states—one of our core interests.

As a remedy to these problems, our analysis utilizes a methodological solution introduced in the field of political science by Bafumi, Gelman and colleagues (Bafumi and Gelman 2006, Gelman et al. 2007, Shor et al. 2007). The technique uses a random-effects model conditioned on the mean of the individual-level variables. This type of analysis modifies traditional hierarchical linear modeling (HLM) techniques to account for the issue of dependence among the error terms at different levels. The state-level mean of each individual-level variable is calculated and added to a random-effects model as a group-level predictor, thus removing the correlation between the individual units and the group-level error.

This approach is similar to a fixed-effects analysis, as only the variation around the mean remains for each institution-level characteristic. However, it provides an additional advantage over fixed-effects models by also accounting for variation in the state-level factors. The model is specified as follows:

\[
Y_{is} = \alpha_i + \beta_1 x_{is} + \beta_2 \bar{x}_s + \beta_3 w_s + \delta_1 z_{is} + \\
\delta_2 \bar{z}_s + \gamma_1 w_s \bar{z}_s + \gamma_2 w_s \bar{z}_s + \epsilon_{is}
\]

for each institution \(i\) in state \(s\) where

- \(Y_{is}\) = appropriations per FTE (logged) for institution \(i\) in state \(s\)
- \(\alpha_i\) = constant term for each institution
- \(x_{is}\) = matrix of institution-level variables
- \(\bar{x}_s\) = matrix of the state-level mean for each of the institution-level variables
- \(w_s\) = matrix of state-level variables
- \(z_{is}\) = dummy variable indicating whether the institution is a Carnegie research university
- \(\bar{z}_s\) = state-level mean of the Carnegie research university dummy variable
- \(w_s \bar{z}_s\) = interaction of state-level variables with the Carnegie dummy
- \(w_s \bar{z}_s\) = interaction of state-level variables with state-level mean of the Carnegie dummy
- \(\epsilon_{is}\) = error term

Within this equation, there are four main parameter estimates of interest. First, \(\beta_1\) indicates how the institution-level variables affect the amount of appropriations per FTE that an institution receives. A positive coefficient represents institutional characteristics that have a positive effect on state appropriations, regardless of whether an institution is a Carnegie research
university, while a negative coefficient represents institutional characteristics that have a negative effect. Similarly, $\beta_3$ indicates how the state-level variables affect the amount of appropriations per FTE that an institution receives, regardless of Carnegie research university status. Next, $\delta_1$ represents the difference in state appropriations per FTE for research and non-research universities. A positive coefficient is expected here, indicating that research universities tend to receive greater appropriations per FTE than non-research universities. If this estimate is not statistically significant, then there is no difference in the level of appropriations per FTE between these two types of institutions after holding constant the other factors in the model.

The last parameter estimate of interest is $\gamma_1$, representing how the effects of state-level characteristics differ for Carnegie research universities and non-research universities. Interpreting these coefficients requires an examination of the coefficients on the Carnegie research dummy variable, the state-level characteristic of interest, and the interaction term. We can assume that the coefficient on the Carnegie research dummy variable will be positive in the baseline model, as we have already noted that research universities receive significantly higher levels of appropriations than non-research universities. One scenario is that a state-level characteristic will have a positive coefficient and the corresponding interaction term will also have a positive coefficient. This indicates that the state-level variable is associated with higher levels of appropriations in general, and that states with high values of this characteristic tend to "privilege" their public research universities by allocating greater appropriations per FTE to these institutions relative to non-research universities. If the coefficient on the state-level characteristic remained positive, but the coefficient on the interaction term was negative, it would indicate that the state-level variable is associated with higher levels of appropriations in general, and that the particular state-level characteristic is also associated with a more equitable distribution of resources between research and non-research universities. Thus, the coefficient on the state-level variable indicates the overall effect of the characteristic, while the coefficient on the interaction term signifies whether the characteristic is associated with either greater "privileging" to research universities or a more equitable distribution of appropriations across institution types.

The remaining parameter estimates ($\beta_4^{sx}, \delta_2^{sz}, \text{and } \gamma_2^{w}\bar{z}$) control for the state-level mean of each of the institution-level parameters in the model, and have been included to remove the correlation between the institution-level predictors and the group-level error. These estimates are nuisance parameters that do not have a meaningful interpretation, and have not been included in the table of the final results.
The analysis was conducted sequentially so the relative importance of each set of variables could be assessed above a set of control variables. The baseline model included the Carnegie research university dummy variable with three institutional student characteristics (i.e., proportion of total enrollment from graduate students, proportion of non-resident student enrollment, and proportion of completions in STEM fields). From the baseline model, blocks representing the variables in each set of hypotheses were added separately, and the log-likelihood statistics were compared to the baseline model to determine if the additional variables contributed to improving the overall fit of the model.

**RESULTS**

Figure 2 illustrates the distribution of state appropriations per FTE for Carnegie research universities compared to other public four-year institutions. On average, appropriations per FTE are $8,261 at research universities, and $5,712 at non-research universities. This difference of $2,549 is both practically and statistically significant, indicating that research universities do commonly appear to be “privileged” in the state-budget process. There is considerable variation, however, across states in terms of how inequitably appropriations are distributed to different types of institutions. As noted previously, there is no statistically significant difference in the level of appropriations per FTE by Carnegie research university classification in states such as Virginia and

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**Figure 2. Appropriations per FTE by Carnegie research university classification**

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Note: The fully specified model (6) does not provide a significant increase in fit over the null model (1).
Mississippi, whereas Minnesota and Utah spend nearly three times as much on their research universities. Why is this so?

The results from the multivariate analysis are presented in Table 3. When we hold constant the institutional student characteristics, the coefficient for the Carnegie research university dummy variable is positive and statistically significant in the baseline model (Model 1). This indicates that, after accounting for institutional student characteristics, research universities still tend to receive higher levels of appropriations per FTE than non-research universities. The two institutional student characteristics that are significant predictors of state appropriations across all specifications of the model are the proportion of total enrollments from graduate students and the proportion of completions in STEM fields. Figure 3 provides a graph of the predicted values of appropriations per FTE by the proportion of graduate enrollments and the fitted regression line from the fully specified model (Model 6). On average, institutions with a high proportion of enrollments from graduate students tend to receive higher levels of appropriations per FTE than institutions that serve fewer graduate students. Research universities generally enroll more graduate students than non-research universities, and this difference contributes to the unequal distribution of state resources to the different types of universities in some states.

Figure 3. Appropriations v. Percent Graduate Enrollments

![Figure 3. Appropriations v. Percent Graduate Enrollments](image-url)
Table 3. Results for random effects model conditioned on the mean of the individual-level variables (dependent variable is appropriations per FTE logged)

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>S.E.</td>
<td>β</td>
<td>S.E.</td>
<td>β</td>
<td>S.E.</td>
</tr>
<tr>
<td>Carnegie research university (1=yes, 0=no)</td>
<td>0.14 **</td>
<td>0.04</td>
<td>0.08</td>
<td>0.05</td>
<td>-0.21</td>
<td>0.26</td>
</tr>
<tr>
<td><strong>Institutional Control Characteristics</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of total enrollment from graduate students</td>
<td>1.61 **</td>
<td>0.22</td>
<td>1.47 **</td>
<td>0.22</td>
<td>1.57 **</td>
<td>0.22</td>
</tr>
<tr>
<td>Proportion of undergraduate enrollment from non-residents</td>
<td>-0.96</td>
<td>0.58</td>
<td>-0.81</td>
<td>0.57</td>
<td>-0.98</td>
<td>0.58</td>
</tr>
<tr>
<td>Proportion of completions in STEM fields</td>
<td>0.35 **</td>
<td>0.11</td>
<td>0.39 **</td>
<td>0.10</td>
<td>0.34 **</td>
<td>0.11</td>
</tr>
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<td><strong>Institutional Political Influences</strong></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Institution is located in the state capital (1=yes, 0=no)</td>
<td>0.12 *</td>
<td>0.06</td>
<td>0.12 *</td>
<td>0.06</td>
<td>0.12 *</td>
<td>0.06</td>
</tr>
<tr>
<td>Governor graduated from the institution (1=yes, 0=no)</td>
<td>0.15</td>
<td>0.09</td>
<td>0.15</td>
<td>0.09</td>
<td>0.15</td>
<td>0.09</td>
</tr>
<tr>
<td>Proportion of legislative committee appropriations members that graduated from the institution</td>
<td>0.58 *</td>
<td>0.28</td>
<td>0.58 *</td>
<td>0.28</td>
<td>0.58 *</td>
<td>0.28</td>
</tr>
<tr>
<td><strong>State Political-System Characteristics</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of legislators who are Democrats</td>
<td>1.59 *</td>
<td>0.74</td>
<td>2.59 **</td>
<td>0.88</td>
<td>2.59 **</td>
<td>0.88</td>
</tr>
<tr>
<td>Proportion of legislators who are Democrats X research university</td>
<td>0.32</td>
<td>0.28</td>
<td>0.30</td>
<td>0.31</td>
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<td>0.31</td>
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<tr>
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<td>0.01</td>
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<td>0.00</td>
<td>0.00</td>
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<td>0.00</td>
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<tr>
<td>Term limits (1=yes, 0=no)</td>
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<td>-0.25 **</td>
<td>0.09</td>
<td>-0.25 **</td>
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</tr>
<tr>
<td>Term limits X research university</td>
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<td>0.00</td>
<td>0.09</td>
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<td>Legislative professionalism</td>
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<td>0.73</td>
<td>1.14</td>
<td>0.73</td>
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<td>Legislative professionalism X research university</td>
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<td>0.26</td>
<td>0.41</td>
<td>0.32</td>
<td>0.41</td>
<td>0.32</td>
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<tr>
<td>Gubernatorial budgetary power</td>
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<td>0.18</td>
<td>-0.49 *</td>
<td>0.22</td>
<td>-0.49 *</td>
<td>0.22</td>
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<tr>
<td>Gubernatorial budgetary power X research university</td>
<td>0.11</td>
<td>0.08</td>
<td>0.19</td>
<td>0.09</td>
<td>0.19</td>
<td>0.09</td>
</tr>
</tbody>
</table>
Table 3. Results for random effects model conditioned on the mean of the individual-level variables (dependent variable is appropriations per FTE logged)

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
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<tbody>
<tr>
<td></td>
<td>β</td>
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<td>β</td>
<td>S.E.</td>
<td>β</td>
<td>S.E.</td>
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<tr>
<td><strong>Economic &amp; Demographic Conditions of States</strong></td>
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<tr>
<td>Per capita income (logged)</td>
<td>0.56</td>
<td>0.59</td>
<td></td>
<td></td>
<td>-0.19</td>
<td>0.72</td>
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<tr>
<td>Per capita income (logged) X research university</td>
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<td>-0.06</td>
<td>0.45</td>
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<tr>
<td>Proportion of the population ages 18 to 24</td>
<td>-17.76</td>
<td>10.80</td>
<td>-28.56</td>
<td>* 11.88</td>
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<tr>
<td>Proportion of the population ages 18 to 24 X research university</td>
<td>2.44</td>
<td>5.38</td>
<td>8.40</td>
<td>6.20</td>
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<td><strong>Postsecondary Characteristics &amp; Governance</strong></td>
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</tr>
<tr>
<td>Governance structure (1=Coordinating boards with strong budget authority, 0=other)</td>
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<td></td>
<td></td>
<td></td>
<td>-0.03</td>
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</tr>
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<td>Coordinating board X research university</td>
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<tr>
<td>State uses formula funding (1=yes, 0=no)</td>
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<td>0.17</td>
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<td>Formula funding X research university</td>
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<tr>
<td>Proportion of higher education enrollments in private institutions</td>
<td></td>
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<td></td>
<td></td>
<td>1.21</td>
<td>0.70</td>
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<tr>
<td>Proportion of higher education enrollments in private institutions X research university</td>
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<td></td>
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<td>0.33</td>
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<td>Constant</td>
<td>8.50</td>
<td>** 0.28</td>
<td>8.46</td>
<td>** 0.30</td>
<td>9.17</td>
<td>** 0.61</td>
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<tr>
<td>Degrees of Freedom</td>
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<td>14</td>
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<td>23</td>
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<tr>
<td>Difference in log likelihood from model 1</td>
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<td>17</td>
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<tr>
<td>Difference in degrees of freedom from model 1</td>
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<td>12.82</td>
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<tr>
<td>Prob &gt;chi2</td>
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<td></td>
<td>0.62</td>
<td></td>
<td>0.77</td>
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</table>

*p≤0.05, **p≤0.01,
To further illustrate this finding, let us again consider the cases of Utah and Illinois. In Utah there was a large disparity in appropriations per FTE between research and non-research universities, but 13.5% of students enrolled in research universities were graduate students, compared to less than 1% of students in other public institutions in the state. Conversely, in Illinois there is no significant difference in appropriations per FTE by institution type, but the percentage of enrollments from graduate students is relatively similar for research universities (17.6%) and for other public four-year institutions (14.7%) in the state. Thus, while graduate education occurs almost exclusively among the research universities in the state of Utah, both research and non-research universities provide graduate education in Illinois, so the non-research universities face different costs per student in these two states.

We also find that the proportion of completions in STEM fields is positively associated with appropriations per FTE (see Figure 4). In many states, research universities tend to educate more students in these resource-intensive STEM fields, thus contributing to the differences in funding between research and non-research universities. For example, in North Dakota 46% of graduates in research universities complete degrees in STEM fields compared to 18% of graduates in the state’s other public universities. In states such as Arkansas, there is no difference in the proportion of completions in STEM fields by institution type, so the costs associated with the courses provided are similar.

Figure 4. Appropriations v. Proportion of STEM Completions

![Graph showing the relationship between appropriations per FTE and the proportion of STEM completions. The graph includes data points for research universities and other universities, with a trend line indicating a positive correlation.](graph_url)
When we add institutional political influences to the baseline model (see Model 2), we find several interesting new effects—notably the university’s proximity to the state capital and the proportion of legislative appropriations-committee members that graduated from the university. Moreover, the coefficient for the Carnegie research university dummy variable is no longer statistically significant at conventional levels. This indicates that, after controlling for the institutional student and political characteristics, there is no difference in the level of appropriations per FTE allocated to research and non-research universities.

Figure 5 provides a graph of the predicted values of appropriations per FTE by whether the institution is located in the state capital, and the fitted-regression line from the fully-specified model (6b). Both research and non-research universities receive an average of more than $550 per FTE than similar institutions in other locations. Research universities are also more likely to be located in the state capital (12%) compared to other public universities (6%).

Figure 6 illustrates the predicted positive relationship between appropriations per FTE and the proportion of legislative committee appropriations members that graduated from the institution. On average, appropriations per FTE tend to be higher at institutions where a large proportion of the legislative committee appropriations members graduated from the university. The extent of legislative appropriations committee members attending in-state public universities varies

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**Figure 5. Appropriations v. Institutions Located in the State Capital**

![Graph showing the relationship between Log Appropriations per FTE and whether the institution is in the state capital (1=State Capital, 0=Other Location). The graph indicates a positive relationship, with research universities receiving more than $550 per FTE compared to similar institutions in other locations.]
markedly by state. For example, in Vermont seven of the 18 appropriations committee members (nearly 40%) graduated from the University of Vermont. Yet in Idaho, fewer than 10% of the legislative appropriations committee members in 2003 held an undergraduate degree from a public university in Idaho, so this factor had little influence on the distribution of appropriations across institutions in the state.

The fully specified model controls for other important characteristics of states that we hypothesized might influence a university’s level of appropriations. Even though the model does not fit the data very well, we find that there are several political and demographic characteristics of states that influence the level of appropriations per FTE to all public research and non-research universities. Among the state political-system characteristics, there is a statistically significant, positive effect from the proportion of legislators who are Democrats in both subset Model 3 (including state political-system characteristics) and the fully-specified model (Model 6). On average, institutions tend to receive higher levels of appropriations per FTE as the proportion of Democratic legislators increases, regardless of Carnegie research classification. In both the subset and the fully-specified models, there is also a statistically significant, negative effect from gubernatorial budgetary power, as hypothesized. That is, as the sole statewide-elected leader with fiscal responsibility for maintaining a balanced budget,
governors are more likely to constrain state spending on higher education, if they have strong budgetary powers. We also find that term limits are associated with lower levels of appropriations per FTE in the final model, although the effects are not significant in the subset model (3). This provides some evidence to support our hypothesis that term limits may impose greater fiscal discipline on the legislature and lead to lower overall spending on higher education.

Among the economic and demographic characteristics, there is a negative relationship in the final model between the proportion of the population aged 18 to 24 as hypothesized, but this finding is not significant in the subset Model 4. This provides some evidence that, holding other factors constant, institutions tend to receive lower levels of appropriations per FTE when the proportion of traditional college-age students in the population increases. In Model 5 and the fully specified Model 6, none of the variables from the postsecondary characteristics and governance patterns section were significant. Interestingly, none of the interaction terms between any of the state-level variables and the Carnegie research university dummy variable are statistically significant. This suggests that, after taking into account the different characteristics of universities in different states, we were not able to detect any influence of state characteristics on the privileging of research universities. This lack of statistical significance extends even to state policies such as funding formulas, which in part are intended to help equalize the distribution of appropriations across institutions.

CONCLUSIONS

The findings from this study suggest that there is considerable variation across states in terms of the distribution of appropriations per FTE to research universities and other public four-year institutions. One of the primary reasons why some states appear to “privilege” their research universities is because the research universities in these states tend to engage in more expensive types of activities than do their non-research counterparts. In particular, differences between research universities and other public four-year institutions in the proportion of enrollments from graduate students and the proportion of completions in STEM fields account for some of the variation in the distribution of state appropriations to the different types of institutions. Thus, institutions tend to receive more money per student for providing graduate education and technology-dependent courses—ones that are more expensive to provide.

Yet, even after controlling for these basic institutional characteristics, one still finds unexplained variation in the distribution of appropriations per FTE to research and to other public four-year universities. The remaining difference can be accounted for by certain political influences which tend to disproportionately
benefit research universities. Both research and non-research universities located in state capitals receive higher levels of appropriations per FTE than similar institutions in other locations, suggesting that an institution's physical proximity to state policymakers may affect its ability to effectively lobby for its interests. Additionally, the proportion of legislative-appropriations committee members that graduated from an institution is positively associated with the level of appropriations per FTE for both types of universities. In effect, legislators tend to privilege those institutions with which they hold close personal ties. Research universities are more likely to be located in the state capital and tend to have more alums serving on legislative-appropriations committee, which accounts for some of the difference in patterns of state funding across public four-year universities.

We also find that there are some political and demographic characteristics of states that affect the level of appropriations to all institutions—regardless of Carnegie research status. In particular, funding for higher education tends to be greater in states with a high proportion of Democrats in the legislature, buttressing some previous scholarship (Archibald and Feldman 2006, Koshal and Koshal 2000, McLendon and Hearn 2007, Okunade 2004). In addition, appropriations per FTE tend to be lower when the governor has strong budgetary powers—a finding that evinces the need for further empirical work on gubernatorial influence in higher education. There is also some evidence suggesting that term limits and the proportion of the college-aged population may influence the level of appropriations that institutions receive, although these findings are not as robust across multiple specifications of the model.

These findings represent distinctively new perspectives on the factors associated with state funding of public universities. They evidence the need for a closer examination of the link between state-policy outputs in higher education and the characteristics of legislative committees and of the individuals who serve on them. What is more, they point to the value of tethering more tightly research on higher-education policy with perspectives distilled from the areas of comparative-state politics and political economy. Until very recently, the field of higher-education studies and the discipline of political science had largely ignored one another. Increasingly, scholars are exploring important terrain at the intersection of these two areas (Lowry 2007, McLendon 2003), and our study contributes modestly toward that goal.

Our study raises a number of specific directions for future research. One might examine the distribution of appropriations among other types of institutions where privileging is believed to occur. For example, what factors account for differences across states in the distribution of appropriations to historically black colleges and universities (HBCUs) relative to predominantly white institu-
tions? Or between urban and non-urban, state-supported institutions of higher education? Or between the two-year and four-year sectors of higher education? Or between and among regions within a given state? What’s the nature of the distributional politics of state funding of these sectors and institutions?

Building on the model that we have developed, a more strenuous test of the political-economy perspective could also be conducted by examining the extent to which legislators privilege the colleges or universities located in their electoral districts. Other personal sources of privileging could be studied, including whether a university’s president previously held state elected office. Examining these relationships would allow researchers to assess more comprehensively the “personal politics” of public financing of higher education. As McLendon and Hearn (2007) have observed, the unavailability today of data sets containing indicators such as these necessitates data-collection efforts that are quite labor intensive. Yet this line of inquiry, however burdensome, would substantially deepen our understanding of the complexities surrounding state-level financing of higher education.

References


National Center for Public Policy and Higher Education. 2004. Responding to the crisis in college opportunity, #04-1 National CrossTalk.


Endnotes

1. IPEDS is the most comprehensive single source of data on the finance and enrollment patterns of colleges and universities in the United States. It is administered by the U.S. Department of Education via a series of annual surveys of institutions.

2. The states of Nebraska, Hawaii, Alaska, and Pennsylvania were excluded from the analysis for reasons both conceptual and data-related. Nebraska was omitted because the state’s unicameral, non-partisan legislature precludes our testing for partisanship effects—a key conceptual concern of the study. Alaska and Hawaii are commonly excluded from studies of comparative state politics because of their outlier values on various indicators (Berry and Berry 1990, Mintrom 1997). Pennsylvania could not be included in the analysis because more than 30 of its public universities were missing IPEDS data on appropriations—Pennsylvania accounted for more than half of all missing observations in the data set.

3. The University of California San Francisco and California State University at Channel Islands were both excluded because they had extreme outlier values on the dependent variable. In addition, all three of the Rutgers University campuses in New Jersey were omitted because of unusual values on several of the variables used in the analysis.

4. We contacted State Higher Education Executive Officers (SHEEOs) in a number of states to accurately recreate the timeline of the state-budget process. In most states, the initial state-budget proposal begins in the governor’s office at the beginning of the calendar year. It is submitted to the state legislature in early spring, and approved by late spring or early summer of that year. The fiscal year for public universities begins in July of the same calendar year, and runs until the end of June in the following year. As a result, institutions often do not know the exact amount of state appropriations they will receive until right before their fiscal year begins. Thus, higher education appropriations for the 2003–04 fiscal year (represented in the 2004 IPEDS finance survey) were allocated by the state government in the spring or early summer of 2003.

5. The correlation between percentage of graduate enrollments and Carnegie research university was relatively high (i.e., r=0.58), yet the Variance Inflation Factors in the final model showed that all values were less than 5.0.

6. In three states, we were unable to locate biographical data on appropriations committee membership in both chambers and, thus, we used data on one chamber, alone. The states (and the chambers) for which we obtained data in those three cases are Georgia (House Appropriations), Louisiana (Senate Finance), and West Virginia (House Finance).

7. Typically, there were appropriations committees—occasionally, finance or ways and means committees.

8. STEM fields were defined using the classification from the U.S. Department of Energy’s Experimental Program to Stimulate Competitive Research (DOE EPSCoR). The following CIP codes were classified as STEM fields: Agriculture, Agriculture Operations and Related Sciences (01); Natural Resources and Conservation (03); Communications Technologies/Technicians and Support Services (10); Computer and Information Sciences and Support Services (11); Engineering (14); Engineering Technologies (15); Biological and Biomedical Sciences (26); Mathematics and Statistics (27); Military Technologies (29); Physical Sciences (40); Science Technologies/Technicians (41); Psychology (42); and Health Professions and Related Clinical Sciences (51).