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The effects of state political interests and campus outputs on public university revenues

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Abstract

Using data for 428 individual campuses in all 50 states, I show that state government funding and tuition and fee revenues at public universities depend on both political and economic factors. State government funding varies depending on the relative size of various interest groups in each state, as well as the ability of public universities to present a united front when dealing with state government. Differences in state government funding at specific campuses reflect differences in the net political benefits to political officials from the supply of instruction, academic research and public service. Net tuition and fee revenues are higher at campuses that receive less state government funding, but also higher in states where public universities have more financial autonomy. The price of attending college thus depends in part on whether the relevant decision makers are state government officials or university administrators.

JEL classification: H42; H72; I22

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1. Introduction

Although public universities obtain revenues from a wide variety of sources (Noll, 1998), by far the most important sources of unrestricted revenues remain state governments and students. For campuses analyzed in this paper, the median share of all unrestricted revenues obtained from these sources was 78 percent in 1994–95, and 93.5 percent if I exclude stand-alone activities such as hospitals and federal research centers. Revenues from both of these sources relative to enrollments vary widely across campuses. State government funding per full-time equivalent (FTE)[1] student ranged from US$17,102 at the University of Alaska-Fairbanks to just US$935 at Castleton State College in Vermont. Net tuition and fee revenues per FTE student ranged from US$10,885 at the University of Vermont to just US$871 at Northwest Oklahoma State University (National Center for Education Statistics, 1994–95).

Comparisons based on dollar amounts per FTE student are not very enlightening, however, as revenues from both sources should vary depending on a number of political and economic factors. State government funding for public universities should depend initially on available government resources and the political costs and benefits to legislators and governors from allocating scarce resources to public higher education. Funding for particular campuses should also depend on the mix of students and the extent to which each campus supplies public and quasi-public goods such as academic research, agricultural extension services, and public policy advice. Tuition rates obviously differ for state residents and nonresidents, and should also depend on the

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[1] Throughout this paper, full-time equivalent enrollment is measured as the number of full-time students plus one-third the number of part-time students.

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amount of state government funding and students' willingness to pay for instruction at each campus. Moreover, public universities in different states enjoy different degrees of autonomy over financial matters (Volkwein & Malik, 1997). Tuition and fee revenues may depend on whether the relevant decision makers are state government officials or public university administrators.

Nonetheless, relatively little research exists explaining revenues from state governments and students at individual public university campuses. Virtually all previous studies of state government funding are limited to major research universities, or use data aggregated to the state level. Many of these studies do not ask whether state government funding is affected by political interests, or whether funding for individual campuses is affected by the supply of public and quasi-public goods. Studies that simultaneously analyze state government funding and tuition revenues are even less common. Most previous studies omit tuition revenues entirely, while others assume that tuition rates are set independent of state government funding.

I estimate a system of four equations in order to determine the effects of political interests and campus outputs on revenues at 428 public university campuses in all 50 states. I estimate revenue equations for state government appropriations, grants and contracts, and net tuition and fee revenues. I also estimate equations for separately budgeted spending on research and public service to nonacademic constituencies, in order to allow for simultaneous causation between spending and revenues.

Given tax revenues, state government funding for public universities is lower in states with many elderly residents, who receive few or no direct benefits from public universities but do benefit from other government programs. State government funding is also lower in states with large private higher education sectors, and where a large number of university governing boards limits the ability of public universities to present a united front when lobbying on their own behalf. The marginal effects of campus outputs on state government funding vary depending on the extent to which they benefit important state constituencies, and perhaps a tendency for university administrators and faculty to expand certain programs rather than maximize revenues. The marginal effect of state resident undergraduate enrollment exceeds the effects of nonresident undergraduate and graduate and professional enrollments, while the marginal effect of spending on public service to nonacademic constituencies exceeds that of spending on academic research.

Net tuition and fee revenues also reflect both political and economic considerations. Controlling for enrollments, input prices, and students' willingness to pay, net tuition and fee revenues are higher at campuses with limited state government funding, but also higher in states where public university campuses have more autonomy over financial matters. This implies that university administrators are less concerned with maintaining low tuition rates than are state legislators and executives.

Finally, the determinants of separately budgeted spending on academic research are somewhat different from the determinants of spending on public service. Controlling for revenues and land-grant status, spending on research is a complement to graduate and professional instruction, but a substitute for undergraduate instruction. Spending on public service to nonacademic constituencies is independent of enrollments, but tends to be higher in states where farming is an important part of the state economy.

Section 2 summarizes previous research on state government funding of public universities. Section 3 discusses my model specification and the expected effects of my explanatory variables. Section 4 presents the empirical analysis, and Section 5 summarizes key findings and implications.

2. Previous research

Previous empirical studies of state government funding of public universities have not produced a consensus specification. They differ initially in the unit of analysis and measurement of the dependent variable. Borcherding and Deacon (1972), Clotfelter (1976), and Goldin and Katz (1999) examine statewide government funding per capita; Strathman (1994) uses statewide appropriations per student; and Peterson (1976) examines both.[2] Hoenack and Pierro (1990) examine appropriations to the University of Minnesota divided by state voting-age residents over a period of 34 years, while Coughlin and Erekson (1986) analyze appropriations per student for 42 public universities in 1980–81. Cohen and Noll (1998) use panel data to examine the annual percentage change in appropriations to 83 public research universities, and Leslie and Ramey (1986) examine appropriations to individual public universities, controlling for enrollment as an explanatory variable. Lindeen and Willis (1975) examine correlations between various measures of statewide funding and political, social or demographic variables.

These studies establish that state government funding for public universities increases as a function of state government resources, although the variables used to measure resources also differ. Borcherding and Deacon

[2] Most of these studies simply refer to "appropriations," without being explicit about whether the dependent variable also includes state government grants and contracts. I include all state appropriations, grants and contracts, but in practice, about 92 percent of these revenues for campuses in my data set are unrestricted appropriations.

(1972), Clotfelter (1976), Strathman (1994) and Goldin and Katz (1999) use per capita state income, while Hoenack and Pierro (1990) use state tax revenues divided by voting-age population. Coughlin and Erekson (1986) use separate variables for per capita income and a tax effort index. Lindeen and Willis (1975), Peterson (1976), and Leslie and Ramey (1986) use a variety of economic measures, while Cohen and Noll (1998) use the percentage change in gross state product.

Given state government resources, funding depends on legislative demand for public university outputs relative to demand for other government programs. The earliest studies equate demand with the preferences of the median voter (Borcherding & Deacon, 1972; Clotfelter, 1976; Peterson, 1976),[3] but later studies focus on the importance of interest groups (Cohen & Noll, 1998; Goldin & Katz, 1999; Hoenack & Pierro, 1990). In addition, Clotfelter (1976) and Strathman (1994) argue that legislative demand for university instruction depends on the discounted future benefits from investing in human capital, which are lower in states with significant outmigration.[4]

Few previous studies control for the mix of outputs at individual campuses. Coughlin and Erekson (1986) use cross-sectional data for 42 universities in large football conferences. They find effects from student and faculty quality, and success in intercollegiate athletics. The only campus-specific variables examined by Cohen and Noll (1998) are the existence of an affiliated hospital and the change in federal research grants, while Leslie and Ramey (1986) limit their explanatory variables to enrollments and state economic factors.

Previous studies make different assumptions regarding causation between state government funding and tuition and fee revenues. Coughlin and Erekson (1986) and Hoenack and Pierro (1990) treat tuition as exogenous. (Hoenack and Pierro subtract tuition from the marginal supply price to obtain the net marginal cost to the legislature.) Most other studies implicitly assume that state government funding does not depend on tuition revenues. One exception is Strathman (1994), who finds simultaneous causation between appropriations per student and tuition revenues per student, using data aggregated by state. Finally, no studies have been found that test for whether differences in legal restrictions on public universities have an affect on tuition rates or revenues.

3. Model specification and expectations

I begin by asking which decisions need to be modeled, given my research questions, and which should be treated as exogenous. Since my primary interest is in the effects of state political interests and campus outputs on public university revenues, I model the decision by state legislators and executives to fund individual campuses. I also model net tuition and fee revenues in order to allow for simultaneous causation between state government funding and tuition, and to test for the effect of differences in university autonomy over financial matters (see Volkwein & Malik, 1997). I also model separately budgeted spending on research and public service, which are themselves functions of revenues.

I take as given the number of students and the cost of faculty labor at each campus. Most other studies of public university revenues also treat enrollments as exogenous. Two exceptions are Clotfelter (1976) and Hoenack and Pierro (1990), who treat enrollments as endogenous, but take tuition rates as given. I estimate state government funding and net tuition revenues as functions of lagged enrollments, so that I may focus on the decisions of state government officials and university administrators. Preliminary estimation of equations for undergraduate enrollments and the supply of spaces in graduate and professional programs did not add any insights to the *political* economy of public university revenues.[5]

[3] Peterson (1976) argues that policy in states with more competitive elections should more closely resemble the preferences of the median voter, and then assumes that the median voter demands more funding for public higher education than would occur without competitive elections. Neither of these propositions is obvious. Median voter preferences are empirical matters that could vary from state to state, while the extent to which policy resembles the preferences of the median voter should depend on whether elections are *contestable* and on the opportunities for interest groups to influence policy.

[4] Some previous researchers have asked whether funding decisions reflect the political preferences of elected state officials or the design of institutions, without significant results. Cohen and Noll (1998) include a dummy variable for Republican governors but find no effect on the annual percentage change in appropriations. Peterson (1976) finds that state appropriations are higher in states with more professionalized legislatures. He does not argue that this is related to demand for public higher education specifically. Rather, he claims that professional legislators are inclined toward "developing the highest level of public services obtainable even if the public does not demand it" (1976, p. 529). Clotfelter (1976) tests for effects from fiscal illusion, but does not find any.

[5] Consistent with Clotfelter (1976), Hoenack and Pierro (1990) and results reported in Becker (1990), I find that resident undergraduate enrollment increases with the pool of high school graduates in a state, decreases with resident tuition rates, and increases with tuition rates at competing institutions. I also find, as did Clotfelter (1976), that resident undergraduate enrollments are lower in states with high per capita incomes. Nonresident undergraduate enrollment decreases with nonresident tuition rates (though the effect is not significant), and increases with the rate of net in-migration to each state. The supply of spaces in graduate and professional programs increases with spending on research and public service, and the fraction of adults with college degrees in the state.

3.1. State government funding

I assume that state legislators and executives who allocate funds to public universities are motivated primarily by a desire to maximize the net political support they receive in the form of votes, campaign contributions, or other services. This assumption is based on the extensive public choice literature (e.g., Hoenack, 1983, Ch. 6; Hoenack & Pierro, 1990; Stevens, 1993, pp. 194–96), as well as the absence of a strong efficiency rationale for unrestricted appropriations to public universities (Fischer, 1990; McPherson & Schapiro, 1991; Noll, 1998). The key implication of this assumption is that state government funding for public universities is determined by the political costs and benefits to state government officials from responding to important state constituencies.

I estimate the following model:

> State government funding for campus *i* in state *j* is a function of state government resources in state *j*, political interests in state *j*, enrollments by different categories of students at campus *i*, supply of public and quasi-public outputs by campus *i*, qualitative attributes of campus *i* affecting benefits to state legislators and executives, cost of inputs at campus *i*, other revenues at campus *i*.

The dependent variable is the dollar amount of state government appropriations, grants and contracts per 100,000 voting-age residents in the state. All of my revenue, spending and enrollment variables are divided by state voting-age population in order to be consistent with state tax revenues and interest groups variables, which must be normalized to account for differences in state size. Slightly more than half of the campuses in my sample also receive funds from local governments. I control for these revenues separately in my specification, but achieve nearly the same results if I combine state and local government funding in the dependent variable.

I measure state government resources by general tax revenues per 100,000 voting-age residents. State tax revenues are themselves a function of state economic activity and demands for state government services, but Hoenack (1983, p. 162) argues that this constraint on the legislature's total spending is largely independent of citizens' demands for particular goods and services. I therefore assume that state general tax revenues are exogenous with respect to funding for any individual campus.

Given state government resources, funding for public universities depends on competing demands by state political interests (Cohen & Noll, 1998; Goldin & Katz, 1999; Hoenack & Pierro, 1990). Students who attend public universities (and their parents) can be expected to support higher state government funding. One measure of an opposing interest group is the fraction of voting-age residents who are 65 or older. Elderly residents are unlikely to attend college or have children who attend college, but do benefit from other programs such as medical care, residential tax relief, and public transportation. Hoenack and Pierro (1990) find that this variable has a negative effect on state government funding for the University of Minnesota, and I expect to find the same for campuses in my data set. Another measure of a relevant interest group is total enrollment in private colleges and universities per 100,000 voting-age residents. State residents who are affiliated with private colleges and universities may oppose the use of tax dollars to support their public sector competitors, and the demand for research and other noninstructional services from public universities should be lower in states where these services are also supplied by the private sector. In addition, Goldin and Katz (1999) argue that state support for higher education depends on the historical importance of the private higher education sector in each state. They find that state and local government funding for all institutions of higher education in 1929 was negatively related to private college enrollments in 1900. I therefore expect that state government funding will be lower in states with large private higher education sectors.

No previous empirical studies consider the ability of public universities themselves to lobby state political officials. Most states have multiple campuses, and attempts by individual campuses to obtain more state government funding may undercut the efforts of other campuses. Some states, however, have consolidated statewide boards of trustees that allow individual campuses to present a unified position to state government officials (see Lewis & Maruna, 1996). More generally, coordination problems experienced by public universities should increase with the number of governing boards. Public universities in states that have fewer governing boards should be able to lobby more effectively, and thus obtain more state government funding. See the Appendix for a listing of the number of governing boards in each state.[6]

Differences in state government funding at individual campuses should also reflect the mix of outputs supplied by each campus (Cohen & Noll, 1998; Coughlin & Erekson, 1986; Hoenack, 1983). I measure instructional outputs using separate variables for the number of full-time equivalent resident undergraduates, nonresident undergraduates, and graduate and professional students per 100,000 voting-age residents. In order to accurately mea-

[6] Some states have a separate statewide governing board for community colleges or vocational institutes, while other states have local or county governing boards for community colleges. These boards are not included in my totals.

sure the marginal effect of graduate and professional enrollments, I also include an intercept shift for campuses that have graduate and professional programs. As Hoenack and Pierro (1990) note, enrollments can be interpreted as measures of interest groups that receive direct benefits in the form of subsidized instruction. I expect that state government funding will increase with enrollment by all three types of students, but the marginal effect will be highest for state resident undergraduates. The political benefits to state legislators and governors from funding instruction for resident undergraduates clearly exceed those from funding instruction for nonresident undergraduates. The comparison between resident undergraduates and graduate and professional students is less clear, although the potential benefits from investing in graduate and professional students are reduced if those students are more likely to leave the state after graduation (Clotfelter, 1976; Strathman, 1994). Moreover, university administrators and faculty who receive positive utility from having graduate programs may expand these programs to the point where declining marginal revenues fall below those for undergraduates (James, 1990; Lowry, 1997).

I measure the supply of public and quasi-public outputs at each campus by separately budgeted spending on research and public service per 100,000 voting-age residents. Spending on public service is defined as separately budgeted funds "expended for activities established primarily to provide noninstructional services beneficial to groups external to the institution" (Broyles, 1995, p. 29). It includes such things as agricultural extension services, public policy institutes, and outreach activities to assist community groups and nonprofit organizations.

As with enrollment by different kinds of students, there are two reasons why the marginal effect of public service on state government funding should exceed that of research. First, the political benefits to state government officials from public service should exceed the political benefits from academic research (see Hoenack, 1983, p. 164). Academic research is a relatively pure public good whose benefits are distributed broadly, and research conducted at private universities or government agencies may be a close substitute for research at public universities. Public service is targeted toward specific constituencies, and close substitutes may be lacking. Second, faculty and administrators who prefer doing research over public service should research at a level where marginal revenues are less than those from public service (James, 1990; Lowry, 1997).

I include a dummy variable for campuses that do not report any spending on either research or public service, in order to control for possible anomalies due to accounting practices (see Getz & Siegfried, 1991). I also include a dummy variable for universities that have an integrated medical school. Medical schools should be viewed as particularly valuable by state government officials because they can supply health care training and research that benefits a broad range of constituencies.

State government funding should also depend on the cost of inputs at each campus (Borcherding & Deacon, 1972; Clotfelter, 1976; Hoenack & Pierro, 1990). I use mean total compensation for all faculty members to measure the cost of inputs. I also include funding from local governments, and net tuition and fee revenues. I expect that state government funding will be lower at campuses that are also funded by local governments. The effect of net tuition and fee revenues should be zero or negative, depending on whether state government funding is determined first, or whether the two are set simultaneously.

3.2. Net tuition and fee revenues

My second dependent variable is net tuition and fee revenues per 100,000 voting-age residents. Net tuition and fee revenues are equal to gross revenues minus institutional financial aid. Of course, net revenue from student tuition and fees is not a choice variable. Rather, relevant decision makers first determine "list" prices and the amount of institutional financial aid to be granted. Then net revenues are the product of net prices and enrollments. I estimate a reduced form equation for net tuition and fee revenues that suppresses these underlying relationships.

Net tuition and fee revenues at public universities may depend on political as well as economic factors. Public universities have multiple revenue sources, and product differentiation allows the prices charged for instruction to vary across campuses within each state. Moreover, state government officials stand to benefit from low tuition rates that maximize the number of state residents who can attend college, whereas public university administrators probably prefer to generate discretionary revenues and use them for activities that benefit administrators and faculty (James, 1990). Tuition rates and fees can therefore depend in part on the preferences of relevant decision makers in each state and the availability of alternative revenues that can be used to subsidize instruction (Becker, 1990, p.184).

I estimate the following model:

> Net tuition and fee revenues at campus *i* in state *j* are a function of financial autonomy of campuses in state *j*, enrollments by different categories of students at campus *i*, students' willingness to pay for instruction at campus *i* in state *j*, cost of inputs at campus *i*, other revenues at campus *i*.

I assume that the identity of the relevant decision maker depends on the amount of financial autonomy possessed by public universities in each state. Volkwein and Malik (1997, pp. 33–34) use survey responses from pub-

lic university administrators to rank the states according to the autonomy over financial and personnel matters enjoyed by public universities. See the Appendix for specific state ranks. I use the percentile ranking, scaled from zero to one, with one representing the most autonomy. I expect that net tuition and fee revenues in states with relatively more autonomy reflect the desire of university administrators to generate discretionary revenues, whereas those in states with relatively less autonomy reflect the desire of legislators to keep tuition rates low.

Enrollments are measured using the same variables as in the state government funding equation. Enrollments are included primarily as control variables, and expectations about the marginal effect of different types of students are unclear. Although nonresident and many graduate and professional tuition rates are higher than resident undergraduate tuition rates, *net* tuition and fee revenues depend on the allocation of institutional financial aid.

Regardless of the relevant decision maker, net tuition and fee revenues should increase with students' willingness to pay for instruction at each campus. Thus, I include state per capita income, and expect that net tuition and fee revenues will be higher in states where students have more resources. Students should also be willing to pay more to attend campuses with better academic reputations. I measure reputation using the ranking in the annual survey of "America's Best Colleges" from the *US News & World Report* (1994). These rankings are based on surveys of academics who are asked to rank the institutions in their peer group by quartiles (US News & World Report, 1994, p. 9). Separate rankings are constructed for "national" and "regional" universities.[7] I converted these rankings into percentiles (scaled from zero to one, with one being high), and combined the four regional rankings into a single index. I also include a dummy variable for regional universities to allow for different intercepts as well as different slopes, and one for campuses with integrated medical schools. Campuses with medical schools should generate more net tuition and fee revenues because of medical students' own high willingness to pay, and because a medical school may enhance the overall prestige of the university.

Students' willingness to pay should also be affected by the economic value of a college degree. Hoenack and Pierro (1990) measure this by the relative starting salaries of college graduates and nongraduates in their time series analysis of enrollments at the University of Minnesota. I do not have comparable state-specific data, but the fraction of adults age 25 and over in each state with at least a bachelor's degree serves as a proxy for the importance of a college education in state labor markets. Students' willingness to pay for a college degree should be greater, and thus net tuition and fee revenues should be higher, in states where a larger fraction of the adult population has a college degree (Hoxby, 1997).[8]

Given the absence of perfectly competitive markets, net tuition and fee revenues should also vary with the cost of inputs, so I control for mean faculty compensation. This may also serve as a proxy for higher quality inputs. Finally, other sources of revenues that may be used to subsidize instruction include state and local government funding. Net tuition and fee revenues should increase with mean faculty compensation and decrease with state and local government funding.

3.3. Supply of research and public service

The supply of public and quasi-public outputs at each campus is measured by separately budgeted spending on research and public service per 100,000 voting-age residents. While much of this spending is funded by restricted gifts, grants and contracts from federal and private sources (Noll & Rogerson, 1998), faculty at campuses that receive more revenues from state governments and student tuition and fees should be better able to compete for grants and contracts from other sources. Unrestricted revenues might also be used to fund research and public service directly, either in the expectation of generating more funds from other sources, or to provide nonpecuniary benefits to faculty (James, 1990). I therefore treat separately budgeted spending on research and public service as endogenous variables, and estimate the following models:

Spending on research or public service at campus *i* in state *j* is a function of grants and contracts restric-

[7] *US News & World Report* does not publish the actual criteria for designating a university as "national" or "regional," but describes national universities as institutions that are "more selective . . . [and] place a high priority on research and award large numbers of Ph.D.s" (1994, p. 9). All but one of the 127 national universities in my data set are classified as Research or Doctoral universities by the Carnegie Foundation for the Advancement of Teaching (the exception is Tennessee Tech). None of the 301 regional universities are classified as Research universities; 17 are Doctoral universities, 242 are Comprehensive universities, and 42 are Baccalaureate institutions. My data do not include any institutions classified by *US News & World Report* as liberal arts colleges or specialized institutions.

[8] One variable typically included in student demand equations that is not in my net tuition and fee revenue equation is the price of enrolling at competing institutions. Logically, students' willingness to pay for instruction at a particular campus should depend on the prices charged by its competitors. However, the prices at all other public universities in the state will themselves depend on per capita income, the value of a college degree, state government funding, and the price at campus *i*. I therefore omit competitors' prices from my reduced form equation.

ted to research or public service at campus *i*, unrestricted revenues at campus *i*, other uses for unrestricted revenues at campus *i*, qualitative attributes at campus *i* affecting the supply of research or public service, demand for public service in state *j*.

My data do not allow me to identify the specific nature of any restrictions on grants and contracts, so I use revenues from different public and private sources and endowment income per 100,000 voting-age residents. 99 percent of gross tuition and fee revenues and 92 percent of state government funding at campuses in my data set are not subject to restrictions. In contrast, 85 percent of federal government funding, 85 percent of private gifts, grants and contracts, 77 percent of local government funding, and 63 percent of endowment income carry restrictions.[9]

Other uses for unrestricted revenues are measured by student enrollments, with no distinction between resident and nonresident undergraduates. Graduate and professional student instruction should be a complement to academic research, so I expect the coefficient in the research equation to be positive. Undergraduate instruction should be a substitute for research, so I expect a negative coefficient. Expectations regarding the effects of enrollments on public service spending are uncertain.

An important qualitative attribute that should affect spending on research and public service is land-grant status. Land-grant universities are eligible for certain federal programs involving agriculture and the mechanical arts, and have a long tradition of emphasizing public service to nonacademic constituencies (National Association of State Universities and Land-Grant Colleges, 1995). I therefore include a dummy variable for land-grant status, and expect that both research and public service spending will be higher at land-grant campuses.

The supply of public service to nonacademic constituencies may also depend on the political and economic context in each state. Since public service includes agricultural extension programs (Broyles, 1995), one relevant measure is the importance of agriculture in the state economy. I therefore include the fraction of gross state product due to farming in the public service equation only.

Finally, 38 of the campuses in my data set do not report any separately budgeted spending on research, and 37 do not report any separately budget spending on public service. While it may be that some campuses do not supply any research or public service, there are others where the reported amounts may be affected by accounting practices. Getz and Siegfried (1991) note that institutional accounts do not always match the categories used in the Integrated Postsecondary Education Data System, so that anomalies sometimes occur in the reported data. For example, no campus in the California State University system reported any separately budgeted spending on either research or public service in 1993–94 or 1994–95. Although I lack detailed information on every such case, I include a dummy variable for the 23 campuses that report no separately budgeted spending on either activity. I report the results of alternative specifications below.

3.4. A priori identification

Based on the order condition, each of the equations in my model is over-identified. Exogenous variables excluded from the state government funding equation include land-grant status, academic reputation measures, revenues from federal and private sources and endowments, and state-level variables affecting net tuition and fee revenues or public service spending. Exogenous variables excluded from the net tuition and fees equation include land-grant status, federal and private revenues and endowment income, and state-level variables affecting state government funding or public service spending. Exogenous variables excluded from the research and public service equations include medical school, academic reputation, and all state-level variables except for the fraction of gross state product due to farming.

4. Analysis

My data set consists of all public, four-year institutions in the 50 states for which I was able to obtain complete financial and enrollment data from the Integrated Postsecondary Education Data System, and that are classified as national or regional universities by the *US News & World Report* (1994).[10] Table 1 provides

[9] Other revenue sources that are not included in my model are sales and services of educational activities, auxiliary enterprises, hospitals, independent operations, and miscellaneous sources. Revenues from sales and services "are incidental to the conduct of instruction, research or public service" (Broyles, 1995, p. 30), and thus are endogenous. Auxiliary enterprises, hospitals, and independent operations are stand-alone activities that generate both their own revenues and expenditures. I tested for the effects of miscellaneous income, but the coefficient was insignificant in both spending equations.

[10] The most prominent public universities not in my data set are the University of Connecticut, the University of the District of Columbia, Rutgers University, and the statutory colleges at Cornell University. Faculty compensation data are missing for the University of Connecticut. Rutgers has three separate campuses in New Brunswick, Newark, and Camden, New Jersey, but financial data are available only in the aggregate. The statutory colleges at Cornell are omitted because of its unique institutional arrangement, while the University of the District of Columbia is omitted due to the unique political status of the District.

Table 1
Summary statistics[a,b]

Variable	Nonzero cases	Mean	Standard deviation
State government funding, 1994–95*	428	2.01e6	3.33e6
Net tuition and fee revenues, 1994–95*	428	1.04e6	1.98e6
Research spending, 1994–95*	390	7.76e5	1.98e6
Public service spending, 1994–95*	391	3.51e5	9.27e5
State tax revenues, 1994*	428	1.91e8	3.68e7
State per capita income, 1994	428	20958	2753
Number of governing boards, 1994	428	5.49	4.36
State financial autonomy ranking, 1995	428	0.424	0.309
Private college enrollment, 1994*	428	1538.6	967.8
Fraction voting-age population 65 and over, 1994	428	0.171	0.024
Fraction adults with a college degree, 1990	428	0.195	0.037
Fraction gross state product due to farming, 1994	428	0.015	0.016
Resident undergraduates, 1993–94*	428	209.8	246.7
Nonresident undergraduates, 1993–94*	428	48.8	120.1
Graduate and professional students, 1993–94*	402	44.2	73.1
Land grant university	91	0.213	0.410
Integrated medical school	48	0.112	0.316
National university reputation, 1994	127	0.141	0.263
Regional university reputation, 1994	301	0.364	0.320
Mean faculty compensation, 1993–94	428	56910	9798
Local government revenues, 1993–94*	250	20138	91883
Federal government revenues, 1994–95*	428	7.31e5	1.72e6
Private gifts, grants and contracts, 1994–95*	412	2.55e5	6.53e5
Endowment income, 1994–95*	274	42181	2.11e5

[a] * indicates variable is measured in units divided by 100,000 state voting-age population.
[b] Means and standard deviations are for all 428 cases.

summary statistics. Data are for 1994–95, except for local government revenues, faculty compensation, and enrollments, which are potentially affected by state government funding and tuition revenues. These variables are measured using data for 1993–94. The fraction of adults with a college degree is measured for 1990, which is the most recent year for which reliable estimates are available.[11]

For an "average" public university in my sample, state government funding is about US$2.01 million per 100,000 voting-age resident, and net tuition and fee revenues are just about half that. The average public university campus spends US$776,228 on research per 100,000 voting-age residents, and US$350,994 on public service. Average full-time equivalent enrollments are about 210 resident undergraduate, 49 nonresident undergraduate, and 44 graduate and professional students per 100,000 voting-age residents.

Table 2 presents the results of two-stage least squares regressions for each of my equations, with absolute *t*-ratios shown in parentheses. All dependent and independent variables are measured in natural logs, except for dummy variables and percentile rankings for academic reputation or state financial autonomy.[12] This

[11] Estimates of educational attainment are available for more recent years, but are based on small samples for individual states. I do not adjust local government revenues and average compensation for inflation because measures of relevant price increases in individual states or campuses are not available. All data for individual campuses are from the Integrated Postsecondary Data System (National Center for Education Statistics, various years), except for academic reputation and percent nonresident freshman (US News & World Report, 1994), integrated medical school (Research and Education Association, 1994), and land-grant status (National Association of State Universities and Land-Grant Colleges, 1995). Data on governing boards are from the Education Commission of the States (1994), and financial autonomy is from Volkwein and Malik (1997). Minorities as a fraction of state voting-age population is from US Bureau of the Census (1998). State government tax revenues, personal income, elderly residents, and adults with college degrees are from the US Department of Commerce (various years).

[12] All estimations were performed using Stata version 5.0. Table 1 shows that there are a number of independent variables for which some campuses have zero values. Multiplying the ratio of each variable to state voting-age residents by 100,000 means that virtually all of the positive values exceed one, so that the natural log is positive. With a few exceptions, I recode

functional form assumes that the marginal effect of each independent variable is conditional on the values of all independent variables. Table 3 shows estimated marginal effects of different variables evaluated at the sample means.

4.1. State government funding

Turning first to state-level variables, state government funding is significantly higher in states with more tax revenues. Given tax revenues, state government funding is lower in states with many elderly residents or large private higher education sectors, and both coefficients are at least 2.35 times their respective standard errors. The coefficient for the number of governing boards is negative and more than three times its standard error, consistent with my expectation that a large number of boards makes it more difficult for public universities to engage in effective lobbying.

With respect to campus outputs, state government funding increases with enrollments by all three types of students, and all enrollment coefficients are more than three times their standard errors. The estimated elasticities are 0.475 for resident undergraduates, 0.090 for nonresident undergraduates, and 0.072 for professional and graduate students. However, a one percent increase in the number of resident undergraduate students typically represents many more students than a one percent increase in the number of nonresident undergraduates, or graduate and professional students. Table 3 shows that estimated marginal effects at the sample mean are US$4,553 for resident undergraduates, US$3,703 for nonresident undergraduates, and only US$3,281 for graduate and professional students. The order of these point estimates is consistent with my expectations, although the differences are less than their standard errors evaluated at the sample mean.

The effects of research and public service are consistent with the hypothesis that quasi-public goods targeted toward specific state constituencies are likely to be overfunded, whereas broadly distributed public goods are likely to be underfunded (Hoenack, 1983, p. 164). Both coefficients are positive and at least twice their standard errors, but estimated marginal effects at the sample mean are only US$0.162 for research spending, compared to US$0.469 for public service spending. The estimated difference is thus US$0.307, and its standard error is US$0.193 ($t$=1.59). Additional perspective can be gained by comparing the marginal effects of research and public service to the marginal effects of enrollments. According to the point estimates, it would take about US$9,708 worth of public service by an average public university to have the same impact at the margin as one additional resident undergraduate, compared to almost US$28,105 worth of research.

Public universities with integrated medical schools receive more state government funding than do otherwise comparable campuses, and state government funding also increases with input costs. State government funding is significantly lower at public universities that also receive funding from local governments, and the tradeoff is approximately one-for-one, based on the estimated marginal effect in Table 3. The coefficient on net tuition and fee revenues is positive, and less than its standard error.

4.2. Net tuition and fee revenues

The second column in Tables 2 and 3 shows the results for net tuition and fee revenues. All of the coefficients are statistically significant and have the expected signs, except for local government revenues and the fraction of adults in each state who are college graduates, which have no independent effect. The coefficient for state government funding is negative and more than 2.7 times its standard error. When combined with the results for the state government funding equation, this implies that differences in state government funding lead to partially offsetting differences in net tuition and fee revenues, but not the reverse.

Net tuition and fee revenues are higher in states where public universities have more autonomy over financial and personnel matters, and the coefficient on percentile autonomy ranking is more than seven times its standard error. This is consistent with the hypothesis that state government officials and university administrators prefer different combinations of prices and outputs. Since my equation controls for state government funding and academic reputation, the tradeoff for lower tuition rates in states where public universities have less autonomy is likely to involve reduced amenities such as student services, lower administrative expenditures, or less investment in future capacity and reputation.

Net tuition and fee revenues increase with enrollments by all categories of students, but estimated marginal effects evaluated at the sample means are US$4,120 for resident undergraduates, US$3,836 for nonresident undergraduates, and only US$2,833 for graduate and professional students. When combined with my results

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cases with zero values as one, so that ln(1)=0. There is only one campus that has less than one dollar in endowment income per 100,000 voting-age residents, and I recode that observation as one. There are 23 campuses with less than one nonresident undergraduate per 100,000 voting-age residents, but only one with zero. I recode that observation as 0.1, which is less than the smallest positive value of 0.38. This approach sacrifices some consistency in order to minimize the number of observations that are recoded. There are also several campuses with less than one graduate or professional student per 100,000 voting-age resident, but these are accounted for by my intercept shift for campuses with no graduate or professional programs.

Table 2
Revenues and outputs at public university campuses[a,b,c]

	State government funding	Net tuition and fees	Spending on research	Spending on public service
State-level variables				
General tax revenues	0.402 (4.47)	–	–	–
Per capita income	–	1.132 (5.98)	–	–
Number of governing boards	−0.097 (5.45)	–	–	–
State financial autonomy ranking	–	0.390 (7.27)	–	–
Fraction of voting-age population age 65 or more	−0.255 (2.35)	–	–	–
Private college enrollment/voting-age population	−0.122 (3.54)	–	–	–
Fraction adults with a college degree	–	-0.106 (0.91)	–	–
Fraction of gross state product due to farming	–	–	–	0.369 (2.46)
Campus outputs				
Resident undergraduate enrollment	0.475 (5.58)	0.835 (14.5)	–	–
Nonresident undergraduate enrollment	0.090 (4.42)	0.181 (11.1)	–	–
Total undergraduate enrollment	–	–	−0.833 (2.23)	0.219 (0.43)
Graduate and professional enrollment	0.072 (2.87)	0.121 (5.96)	0.586 (4.07)	−0.178 (1.09)
Dummy for graduate and professional programs	−0.178 (2.50)	−0.138 (2.07)	1.089 (2.47)	0.296 (0.62)
Research spending*	0.062 (3.13)	–	–	–
Public service spending*	0.082 (3.16)	–	–	–
Dummy for campuses reporting no research or public spending	1.051 (7.22)	–	−7.50 (17.0)	−8.22 (17.1)
Campus attributes				
Land-grant university	–	–	0.949 (3.64)	0.354 (1.26)
Integrated medical school	0.238 (4.41)	0.169 (3.14)	–	–
Academic reputation, national university	–	0.519 (5.01)	–	–
Academic reputation, regional university	–	0.243 (3.35)	–	–
Regional university dummy	–	−0.252 (3.49)	–	–
Campus input prices				
Mean faculty compensation	0.625 (4.47)	0.251 (1.74)	–	–
Campus revenues				
Net tuition and fee revenue*	0.071 (0.87)	–	0.062 (0.18)	−0.326 (0.71)
State government funds*	–	−0.194 (2.79)	0.412 (0.98)	1.378 (2.98)
Local government funds	−0.011 (3.16)	0.002 (0.49)	0.040 (1.90)	0.045 (1.99)
Federal government funds	–	–	0.706 (6.68)	0.166 (1.40)
Private gifts, grants and contracts	–	–	0.193 (4.87)	0.129 (3.00)
Endowment income	–	–	0.029 (1.29)	0.041 (1.69)
Constant	−4.89	−10.77	−5.26	−7.15
Cases	428	428	428	428
R-squared	0.942	0.948	0.812	0.732
Root mean squared error	0.281	0.268	1.784	1.921

[a] All equations are estimated with Stata version 5.0, using two-stage least squares. Absolute *t*-ratios are in parentheses.
[b] All variables except dummy variables, academic reputation, and autonomy ranking are measured in natural logs.
[c] * indicates endogenous variable.

for state government funding, the point estimates imply that graduate and professional instruction may be subsidized by revenues from other sources, or at a minimum contributes less at the margin to covering joint costs than does undergraduate instruction. It must be remembered, however, that estimated marginal revenues depend on the actual values of each independent variable. I summarize the results from some additional analysis below.

Turning to students' willingness to pay, net tuition and fee revenues are higher in states with high per capita income, and higher also at campuses with good academic reputations and integrated medical schools. The coefficient for the fraction of adults with a college degree is less than its standard error, but this is due to a high correlation between educational attainment and per capita income (r=0.76). If I drop per capita income from the

Table 3
Estimated marginal effects at sample means[a,b,c]

	State government funding	Net tuition and fees	Spending on research	Spending on public service
Resident undergraduates	4553**	4120**	–	–
Nonresident undergraduates	3703**	3836**	–	–
Total undergraduates	–	–	−2500**	298
Graduate and professional students	3281**	2833**	10284**	−1408
Research spending	0.162**	–	–	–
Public service spending	0.469**	–	–	–
Net tuition and fees	0.140	–	0.046	−0.110
State government funds	–	−0.100**	0.159	0.240**
Local government funds	−1.104**	0.081	1.547	0.792*
Federal government funds	–	–	0.750**	0.080
Private gifts, grants and contracts	–	–	0.590**	0.177**
Endowment income	–	–	0.530	0.340

[a] Estimates are based on sample means shown in Table 1.
[b] * indicates coefficient is at least than 1.96 times its standard error ($p<0.05$, two-tailed test).
[c] ** indicates coefficient is at least 2.56 times its standard error ($p<0.01$, two-tailed test).

model, the coefficient for adults with college degrees jumps from 0.106 to 0.560, and the *t*-ratio jumps from 0.9 to 6.1.

4.3. Supply of research and public service

The final two columns in Tables 2 and 3 show the results for separately budgeted spending on research and public service, respectively. Holding revenues constant, research and graduate and professional instruction are complements, whereas research and undergraduate instruction are substitutes. Research spending is also higher at public universities with land-grant status. The estimated marginal effect of local government revenues exceeds one, but federal government funding and private gifts, grants and contracts are the only revenue sources whose coefficients exceed twice their standard errors. Although the coefficients on state government funding and endowment income are also positive, neither of them approach statistical significance at conventional levels.

The determinants of public service spending are somewhat different. Holding revenues constant, public service spending is not significantly affected by enrollments. Holding enrollments constant, public service spending is not affected by net tuition and fee revenues. The coefficient on land-grant status is positive, but only 1.26 times its standard error. The coefficients for local, state and federal governments, private gifts, grants and contracts, and endowment income all are at least 1.4 times their standard errors, and there clearly is a reciprocal causation between state government funding and spending on public service to nonacademic constituencies. Spending on public service is also significantly higher in states where farming is a large part of the state economy.

4.4. Additional results

As noted above, I include intercept shifts to distinguish the 23 campuses that reported no spending on either research or public service, and the 26 campuses that do not have any graduate or professional students. Interestingly, there is no overlap between these two categories. The positive, significant coefficient in the state government funding equation for campuses with no reported spending on research or public service suggests that these campuses may in fact be supplying at least some of these activities. The intercept shift for campuses that have positive graduate and professional enrollments is negative and significant in the state government funding and tuition and fee equations, and positive and significant in the research spending equation. The result for research spending is intuitive, as it implies that the mere existence of graduate and professional programs results in greater spending on research. The two revenue equations, however, imply that campuses with small graduate and professional programs actually generate fewer revenues than those with no programs.[13] This suggests that there are discontinuities not fully captured by my log–log specification.

I re-estimated my equations using only the 357 cases

[13] The cutoff points at which the net effect of graduate and professional enrollment becomes positive are 11.93 students per 100,000 voting-age residents for state government funding, and 3.14 for net tuition and fee revenues. These figures would fall in the fortieth and ninth percentiles, respectively, among campuses in my data set that have graduate or professional programs.

in my sample that have positive values for graduate and professional enrollment, research, and public service. The results are reassuring. All of the variables in the state government funding have the expected signs and are at least 2.1 times their standard errors, except for net tuition and fee revenue, which has no effect, and research spending, which has a positive effect but a *t*-ratio of just 1.84. All of the variables in the tuition and fee equation (including the fraction of adults with college degrees) have the expected signs and are at least 1.9 times their standard errors except local government revenue, which has no effect. The estimated marginal effects on state government funding evaluated at the subsample mean are US$5,065 for resident undergraduates, US$3,877 for nonresident undergraduates, US$3,636 for graduate and professional students. The estimated marginal effects on net tuition and fee revenues evaluated at the sample means are US$3,911 for resident undergraduates, US$3702 for nonresident undergraduates, and US$2,901 for graduate and professional students. The estimated marginal effect of research spending on state government funding is just 0.134, compared to 0.860 for public service spending. Results for research and public service spending are also close to those shown in Table 2, although the effect of land-grant status in the public service equation is now significant.

I also split my sample and estimated separate models for "national" and "regional" universities, using the *US News & World Report's* classifications. All national universities have positive values for graduate and professional enrollment, research and public service. For regional universities, the coefficients on the intercept shifts for graduate and professional enrollment in my revenue equations are negative, but not significant. The estimated marginal revenues from state government and net tuition and fees for graduate and professional enrollment evaluated at the subsample means exceed those for undergraduates at national universities, but are below those for undergraduates at regional universities. The coefficient on research spending in the state government funding equation is less than its standard error for national universities, while the coefficient on net tuition and fee revenues is negative and 1.97 times its standard error. For regional universities, the coefficients on both research spending and net tuition and fee revenues are positive and twice their standard errors. In addition, the negative coefficient for private higher education enrollment is less than its standard error for national campuses but nearly four times its standard error for regional campuses, suggesting that funding for regional campuses is more susceptible to political interests and history.

Thus, there may well be differences between "full service" campuses and those that supply only limited amounts of graduate and professional instruction, research, and public service. It appears that internal subsidization of graduate and professional programs is most likely at campuses that are primarily engaged in undergraduate instruction, while any tradeoff between state government funding and tuition and fee revenues is confined to the largest, "flagship" campuses. The difference between the marginal effects of public service and research on state government funding is greatest at full service campuses, but this does not necessarily mean that research is being subsidized. In fact, the research spending equations for the full sample and every subsample indicate that research is funded by federal and private grants and contracts rather than state government funds or tuition and fee revenues.

In order to further investigate the determinants of tuition rates, I replaced the equation for net tuition and fee revenues with two equations for the list prices for resident and nonresident freshman. Resident tuition rates and fees increase with academic reputation, per capita income, and financial autonomy, and they decrease with state government funding. Nonresident tuition rates and fees increase with mean input costs, academic reputation, and the fraction adults with a college degree. However, the coefficients for state government funding and campus financial autonomy are each less than their standard errors.[14] This suggests that nonresident tuition rates are driven by cost and demand factors only, whereas resident tuition rates also depend on the identity of relevant decision makers and the level of state government funding.

Finally, I experimented with several variations on my basic specification. If I add intercept shifts for campuses that have positive revenues from private gifts, grants and contracts, local governments, or endowment funds, none of their coefficients are significant and my main results are not affected. I also tested further for the effects of qualitative campus attributes, as well as a variety of state-level variables that other researchers have found to have significant effects on state government funding. None of these alternatives improved the model in Table 2.[15]

[14] The equations are the same as the equation for net tuition and fee revenues in Table 2, except that I omit resident undergraduates and divide nonresident undergraduates, graduate and professional enrollment, and state and local government funding by full-time equivalent enrollment rather than voting-age population. The effects of per capita income and education attainment in the resident tuition rate equation are again affected by multicollinearity.

[15] Neither land-grant status nor academic reputation has a significant effect on state government funding, independent of campus outputs. The presence of an integrated medical school does not affect either research or public service, and the presence of a law school on campus does not have a statistically significant effect on any of my dependent variables, once I control for graduate and professional enrollment. State-level variables tested include the rate of net in-migration, the number of

5. Discussion

My results support the hypothesis that both state government funding and net tuition and fee revenues at public universities depend on political as well as economic factors. State government funding is lower in states with many elderly voting-age residents, who do not benefit directly from subsidized instruction, and also lower in states with large private higher education sectors. Public universities in states that have few governing boards receive more state government funding than those in states that have many boards and thus greater coordination problems. This implies that state government funding depends on the ability of public universities to lobby effectively for themselves.

Although my analysis uses cross-sectional data, the results have implications for the effects of demographic shifts over time. As the fraction of the population over 65 continues to grow in many states (see US Department of Commerce, various years), political opposition to state government funding for public universities may increase. Further work using time series or panel data is warranted in order to study the effects of political interests on changes in state government funding and tuition over time.

Further work is also warranted in order to identify other interest groups that are important for state government funding of public universities. One of the most common policy arguments for state support for higher education is that tuition and fees should be kept low so as to maximize the number of prospective students who can afford to attend college (Fischer, 1990; McPherson and Schapiro, 1991), and previous research suggests that demand for low-cost access to higher education may be correlated with race. Kane (1994, p. 893) finds that the effect of tuition increases from 1973 through 1988 on the probability of college enrollment was greater for Blacks than for Whites in the same income quartile, and argues that this is because Blacks tend to have fewer assets than Whites with similar incomes. McPherson and Schapiro (1997) make a similar argument with respect to both Blacks and Hispanics, which should also apply to Native Americans.[16] When I include the fraction of state voting-age population that is Black, Hispanic or Native Americans in my state government funding equation, the coefficient is positive and 1.95 times its standard error. However, it is not clear whether any causation is associated with race per se or some other attribute such as wealth,[17] nor are there any previous studies suggesting that state governments have been responsive to political pressure from minorities on this issue. Finally, it is possible that this variable is really a proxy for geographic differences. Both state government funding and minority populations are very low in some New England states. When I omit Vermont and New Hampshire from my sample, the coefficient on the minority variable drops by a third and becomes statistically insignificant. I therefore omit any measure of demand for low-cost access from my results in this paper, but raise the question for future research.

My results also go beyond previous studies by showing that state government funding for specific campuses depends on the mix of outputs supplied by each campus. With respect to instructional outputs, the marginal effect of enrollment evaluated at the sample mean is greater for state resident undergraduates than for nonresident undergraduates or graduate and professional students. Further analysis reveals that this result is somewhat sensitive to estimating separate models for subsets of the data, and to the values assumed for different variables. In general, campuses that have small graduate and professional programs are more likely to generate lower marginal revenues from graduate and professional enrollments than from resident undergraduate enrollments. With respect to public and quasi-public goods, the marginal effect of a dollar spent on public service to nonacademic state constituencies exceeds the marginal effect of a dollar spent on a relatively "pure" public good like academic research, and this result becomes even more pronounced when I focus on "full-service" campuses.

All of the factors that affect state government funding also affect net tuition and fee revenues indirectly, but in the opposite direction. In addition, net tuition and fee revenues generated for given enrollments, input costs and students' willingness to pay are higher in states where public university campuses have more autonomy over financial matters. This implies that state legislators seek to hold tuition rates down so that more state residents can afford to attend college. However, my finding

legislative staff per legislator (a measure of legislative professionalism), and two measures of electoral competitiveness provided in Holbrook and Van Dunk (1993).

[16] Median assets for both Black and Hispanic householders were lower than for White householders in the same income quintile in 1993 (US Department of Commerce, 1995, Table F). Comparable data for Native Americans and Asian-Americans are not available, but Native Americans who attend college are more likely than any other racial group to attend a public institution. Thus, 66.8 percent of Whites enrolled at four-year colleges or universities in Fall, 1993, attended a public institution, compared to 67.4 percent of Blacks, 69.1 percent of Asian-Americans, 72.1 percent of Hispanics, and 78.5 percent of Native Americans (National Center for Education Statistics, 1997, Table 206).

[17] Unfortunately, state data on the distribution of household wealth are not available. If I include the fraction of households with incomes below US$25,000 in my state government funding equation, the coefficient is negative and less than its standard error.

that the effect of net tuition and fee revenues on state government funding is not statistically significant suggests that public university administrators who hold the line on tuition increases cannot count on making up the difference with increased state appropriations. Additional research is also warranted on the specific instruments used by state governments to regulate public universities, and their effects on tuition rates and outputs.

Finally, expenditures on academic research and public service to nonacademic constituencies at individual campuses are not affected by net tuition and fee revenues, but do depend on revenues from various government and private sources. The supply of public service to nonacademic constituencies is also greater in states where farming is a more important part of the state economy. Thus, public university outputs as well as revenues depend on both political and economic factors.

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Appendix A. State institutions and procedural controls

Table 4

State	Campuses	Governing boards	Autonomy ranking
Alabama	14	10	5
Alaska	3	1	32
Arizona	3	1	22
Arkansas	9	6	11
California	27	2	44
Colorado	10	5	16
Connecticut	4	2	7
Delaware	2	2	6
Florida	9	1	47
Georgia	16	1	31
Hawaii	2	1	36
Idaho	4	1	37
Illinois	10	4	48
Indiana	11	6	4
Iowa	3	1	14
Kansas	7	1	43
Kentucky	8	8	10
Louisiana	13	3	34
Maine	2	2	19
Maryland	8	3	46
Massachusetts	9	2	40
Michigan	15	13	2
Minnesota	8	3	27
Mississippi	8	1	30
Missouri	12	10	25
Montana	3	1	20
Nebraska	5	2	33
Nevada	2	1	21
New Hampshire	3	1	15
New Jersey	7	12	24
New Mexico	5	6	3
New York	25	2	49
North Carolina	15	1	42
North Dakota	3	1	13
Ohio	11	13	8
Oklahoma	9	4	18
Oregon	6	1	26
Pennsylvania	19	5	12
Rhode Island	2	1	39
South Carolina	11	10	17
South Dakota	4	1	35
Tennessee	9	2	28
Texas	24	13	41
Utah	4	1	29
Vermont	2	2	9
Virginia	13	14	50
Washington	5	6	23
West Virginia	10	2	38
Wisconsin	13	1	45
Wyoming	1	1	1

[a]Number of campuses is the number in my data set.

[b]Data on governing boards are from Education Commission of the States (1994).

[c]Financial and personnel autonomy ranking is from Volkwein and Malik (1997, pp. 33–34).

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