

8-29-2013

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Recommended Citation

Cassell, Mark K. (2013) "The Impact of Unionization on University Performance: A Cross-sectional Time Series Analysis," *Journal of Collective Bargaining in the Academy*: Vol. 0, Article 4.
Available at: <http://thekeep.eiu.edu/jcba/vol0/iss8/4>

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The Impact of Unionization on University Performance: A Cross-sectional Time Series Analysis

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Presented at the 40th Annual Conference of the National Center for the Study of Collective Bargaining in Higher Education and Related Professions April 7-9, 2013, New York, New York.

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In 1968 the union movement in higher education was launched on the CUNY campuses in New York when CUNY held the first academic labor union election on an “integrated, heterogeneous, multi-campus system” (Ladd and Lipset 1973). In the nearly five decades since that historic election, unionization has grown to cover more than a third of all public four-year institutions and 40 percent of faculty at those public institutions (see Figure 1). While unionization is more common at larger institutions, Figure 1 illustrates that even among the smallest public institutions, unionization has increased over time.

Figure 1 here

Yet, despite the benefit of time and the growing number of university faculty who have organized, there is arguably less consensus today over unionization’s impact on university effectiveness than there was in 1968. Today, as then, faculty unions are under fire from legislators, the media, and the public (Davis 2011). The repeated attacks have fueled reductions in state subsidies for higher education, curtailment or elimination of collective bargaining, establishment of so-called “charter” or “enterprise” universities (Martin and Samels 2005), and weakening or elimination of tenure (McPherson, M. and M.O. Schapiro. 1999). This research cuts through the often-hyperbolic rhetoric to examine empirically the relationship between unionization and the performance of public universities.

There are, of course, multiple ways to assess university performance. At the same time data limitations mean that, even if one could reach consensus on the perfect performance measure, it is unlikely that the perfect database would exist. Studies of unionization in higher education typically focus on unions’ impact on individual

attributes such as compensation (Birnbaum 1974 & 1976; Brown and Courtenay 1977; Hendrick *et al.* 2011), working conditions (Wickens 2008), job security and job satisfaction (Ponak and Thompson 1984; Mayer 2011), decision-making and governance (Porter 2012) and academic freedom (DeCew 2003). Relatively few studies look at the impact of unionization on the performance of institutions as a whole. An exception is Kim Cameron's 1982 article, "The Relationship between Faculty Unionism and Organizational Effectiveness."

Cameron's study of 41 four-year institutions in the northeast concluded with two opposing possible relationships between unionization and organizational effectiveness. One possibility is that unionization reduces university effectiveness by centralizing the organization, imposing rigid personnel structures, and reducing the organization's flexibility. Cameron (1982) writes, "When organizational energy is expended in rationalizing the organization through organizing and bargaining activities, less energy is available for the pursuit of multidimensional effectiveness or the satisfaction of multiple constituencies" (20). At the same time, Cameron's work also points to an opposing possibility: far from reducing an organization's effectiveness, unions are likely to occur in universities that have shown to be dysfunctional. Indeed, it is often an ineffective administration that prompts unionization. As a result, Cameron acknowledges that unionism could be a "proactive move to improve organizational performance and institutional interaction" (21). Because he had only cross-sectional data, Cameron was unable to determine which possibility was correct. This research, at its core, takes up Cameron's central question regarding unionization's impact on institutional performance but this time with cross-sectional time series data from the National Center for Education

Statistic's Integrated Postsecondary Education Data System (IPEDS) spanning 23 years and 431 public four-year institutions¹.

The paper is divided into four sections. Methodology and data are presented in Section I. Section II turns to the influence of unionization on higher education efficiency. Section III examines the influence of unionization on higher education effectiveness. Both empirical sections present and test several hypotheses derived from the scholarly literature. A concluding Section IV discusses a possible explanation for the research findings by examining the influence of unionization on a university's budgetary priorities, i.e. the percent of the budget devoted to instruction vs. administration.

I. METHODOLOGY AND DATA

Scholarship on unionization and higher education typically uses cross-sectional data analysis. However, since cross-sectional data offer only a snapshot in time, such approaches are unable to capture change in their models. This research addresses the problem by using time series cross-sectional (TSCS) regression analysis to examine the effect of unionization on changes in university performance and behavior. A panel data regression differs from a regular time-series or cross-section regression in that it has a double subscript on its variables:

$$y_{it} = \alpha_i + x_{it} \beta + \varepsilon_{it}, \quad i = 1, \dots, N; \quad t = 1, \dots, T \quad (1)$$

The i subscript denotes the cross-section dimension (universities) and t denotes the time-series dimension. Most of the panel data applications utilize a one-way error component model for the disturbances, with: $u_{it} = \alpha_i + \varepsilon_{it}$.

¹ The Integrated Postsecondary Education Data System (IPEDS) consists of nine interrelated survey components collected each year from all institutions that participate in any federal financial assistance program authorized by Title IV or the Higher Education Act of 1965.

TSCS data are characterized by repeated observations on the same fixed political units. In this case the units are 432 public four-year universities reporting data annually for 23 years.² The two main options one has in TSCS is to analyze the impact of an independent variable on a dependent variable within a group, i.e. what happens to university performance when a university switches its union status? This is known as “Fixed Effects.” Alternatively, one can use “Random Effect” which analyzes the impact of an independent variable across a group, i.e. what is the average effect of unionization on university performance?

Random effects is used in this analysis for three reasons: 1) the core research questions center around unionization’s impact on university performance generally and not with respect to any specific university; 2) several variables in the analysis (University Selectivity and Carnegie Classification) do not vary over time and thus they would fall out of the analysis were we to use fixed effects; and third, the number of universities that switch union status during the time period is relatively small and thus making it difficult to analyze the impact of a switch in union status. Using random effects allows us to determine the average effect of unionization across four-year public institutions not what would happen if a single university switched its union status.

The data for this research come from the Delta Cost Project, a research organization that has developed a cross-state longitudinal database from the Integrated Postsecondary Education Data System (IPEDS) data at the National Center for Educational Statistics. The value added of the Delta Cost Project’s database is that it enables one to evaluate variables over time, and put information in context through

² Beck (2001) notes that TSCS data are distinct from panel data, which are repeated cross-section data, but the units are sampled and they are typically observed only a few times. TSCS units are fixed; there is no sampling scheme for the units.

comparison with patterns in other states (Delta Cost Project 2013).

To maintain a narrow focus, I exclude vocational schools, medical schools and public 2-year institutions. And, because of the Supreme Court's *NLRB v. Yeshiva University* (1980) decision, private institutions are also excluded from the database³. The 432 public universities over 23 years generate approximately 9,461 observations. Variables used in the analysis are described in Appendix 1.

Dependent variables. I explore the relationship between unionization and performance along two fronts that reflect different values. The first value is efficiency. Are universities without unions more efficient than universities with unions? Two different measures of university costs and expenses are used to capture efficiency. The first measure is total spending on direct educational costs including spending on instruction, student services, and the education share of spending on central academic and administrative support, and operations and maintenance. A second measure of efficiency is total education and general expenditures referred in IPEDS as "core expenses." The measure includes expenditures on instruction, research, public service, academic support, student services, institutional support, operations and maintenance, and scholarships and fellowships.

I also measure university performance in terms of effectiveness: How well does the university fulfill its educational mission regardless of cost? While no single measure can easily capture the mission of an institution, state legislators increasingly use

³ The Supreme Court held that the implied exemption from National Labor Relations Act coverage for so-called managerial employees applied to faculty members at Yeshiva, because their authority over University academic policy was nearly absolute. While it did not prohibit unionization at private institutions, the decision makes it extremely difficult for faculty in private institutions to bargain collectively.

outcomes such as completions and graduation rates as proxies for effectiveness. Three outcome measures are used to capture effectiveness:

Graduation rates. Proportion of full-time, first-time, degree/certificate-seeking undergraduate students graduating within 150 percent of normal time⁴;

Degrees. Number of degrees conferred per 100 full-time enrolled (FTEs) students by a college, university, or other postsecondary education institution as official recognition for the successful completion of a program of studies;

Completions. The total number of completions (awards, certificates, and degrees) granted per 100 full time equivalent students enrolled.⁵

Independent variables. In addition to typically relying on cross-sectional analysis, studies of wages or costs in higher education often fail to control for cost-of-living differences across states. Were unionization rates equally distributed across the country, the variation in the cost of living would not bias the results. But because unionization is positively correlated with living costs, for example, estimates of union impacts that omit this relationship overstate the impact of unionization (Hendrick *et al.* 2011).

A second limitation of earlier work is a lack of attention to state economic and political variables. Studies that examine the influence of unionization on higher education do not typically control for a state's economic or political context. This is somewhat surprising since comparative state policy research routinely finds that the

⁴ Normal Time to Completion - The amount of time necessary for a student to complete all requirements for a degree or certificate according to the institution's catalog. This is typically 4 years (8 semesters or trimesters, or 12 quarters, excluding summer terms) for a bachelor's degree in a standard term-based institution; 2 years (4 semesters or trimesters, or 6 quarters, excluding summer terms) for an associate's degree in a standard term-based institution; and the various scheduled times for certificate programs.

⁵ In IPEDs these data are reported by level (associate's, bachelor's, master's, doctor's, and first-professional), as well as by length of program for some. Institutions report all degrees and other awards conferred during an entire academic year, from July 1 of one calendar year through June 30 of the following year.

political ideology of state policy makers and the economic health of the state influence the priorities of state government.

Lack of attention to state institutional difference is also a limitation of past scholarship on higher education. Knott and Payne (2004) develop a classification of higher education structures across states and show that such structures can influence the behavior of colleges and universities. They find, for example, higher education institutions have more resources in those states in which statewide boards are more decentralized and have fewer regulatory powers. Again, if unionization rates were distributed equally across states than institutional differences might not matter. However, if unionization is concentrated in states that cede discretion over financial matters to colleges and universities, then ignoring this relationship may overstate the impact of unionization.

I address the limitation of previous research by controlling for the following independent variables:

Size of institution. A categorical variable that divides student population into five quintiles coded 1-5 and labeled “very small”, “small”, “medium”, “large”, and “very large”. The values vary over time because they reflect the relative population for any given year.

Carnegie 2005 Classification. The 2005 Carnegie Classification includes all colleges and universities in the United States that are degree-granting and accredited by an agency recognized by the U.S. Secretary of Education. This variable does not vary over time.

Selectivity. Measured in terms of the number of students who apply divided by the number of students admitted. Admission and application information in the Delta Cost Project, does not cover all 23 years. I, therefore, use data for 2009 and assume that selectivity (like the Carnegie Classification) is relatively stable over time.

Cost-of living adjustments. An annual cost of living index for the American states. (Source: William Berry <http://mailer.fsu.edu/~wberry/garnet-wberry/a.html>).

Unionization. The Center for Collective Bargaining in Higher Education (CCBHE) collects the most comprehensive information on unionization among colleges and universities. Using 2010 data provided by CCBHE I construct a dummy variable if any subgroup of faculty (full-time, part-time, or adjuncts) are represented by a union at the institution (1=union, 0=nonunion).

Republican control over government. A political measure created by merging data on the partisan character of each state government. The variable is a variation on the Ranney index and measures the percentage of state institutions (assembly, senate, and executive) controlled by the Republican Party. Thus if the Republican Party controls only one house of government the variable is .33, two houses is .66, and two houses plus the governorship is 1. This variable varies over time.

Economic context. As an indicator of state economic performance, I use per capita state Gross Domestic Product from the Bureau of Economic Analysis at the Department of Commerce. The variable varies over time.

Regulatory Structure. Knott and Payne's measures of regulatory strength and centralization within higher education across states. Knott and Payne classify each state into one of three categories: "highly regulated" (coded as a "3") are states with governing or coordinating board and strong regulatory powers; "moderately regulated" (coded here as "2") are states in which a coordinating board exists with some regulatory powers; and "minimally regulated" (coded as "1") are states which have a coordinating board, advisory or planning agency with few formal regulatory powers.

Partisan Structure. Combines Republican Control and Regulatory Structure. The impact of partisan control may be particular powerful when regulatory system is more centralized. This interactive variable thus combines partisan control of state government with the Knott and Payne's measure of regulatory strength.

The next sections turn to the empirical analysis of unionization's impact on university performance.

II. UNIONIZATION'S IMPACT ON EFFICIENCY

Policymakers and scholars disagree over the impact of unionization on organizational efficiency. Some scholars argue that unionization weakens efficiency.

Economists, for example, argue that by creating a cartel, unionized workers secure

artificially high wages that contribute to higher costs and lower efficiency (Marlow 2013; Vedder, Denhardt, and Robe 2012; see also Riley 2011). Political scientists and sociologists critical of unionization argue that public sector labor unions accrue unfair influence in the political process and use their power to shape elections in favor of policies that support unions at the expense of the public's interest (Moe 2006). Other scholars take an opposing view pointing out that internationally, countries with higher unionization rates enjoy higher productivity than those with lower unionization rates (Metcalf 2003). Some economists suggest that by democratizing the labor force unions lead to more productive organizations in part because greater discretion is allocated to employees nearest to the client or customer (Addison 2005; Wolff 2012). Finally, organizational scholars note that unions reduce turnover, reduce inequality within the organization, increase job satisfaction, and increase employees' commitment to an organization's mission; all factors linked to higher efficiency.

Four Models of Efficiency. To measure unionization's impact on university efficiency I first model direct educational costs and core expense – two different measures of a university's budget described earlier. The two models use the following equation:

$$\log(Y)_{it} = \alpha_i + Union \beta_{it} + Selectivity \beta_{it} + Size \beta_{it} + Republican \beta_{it} + Carnegie \beta_{it} \\ + Reg_Structure \beta_{it} + PerCapitaGDP \beta_{it} + \log(Y)_{i,t-1} + Partisan Structure \beta_{it} \\ + Year Dummies (1 - 23) \beta_{it} + \varepsilon_{it}$$

where Y is a measure of direct instructional costs or core expenses for public four-year institutions adjusted for inflation and the cost-of-living differences between states. The log of both measures is used in order to pull outlying data from a positively skewed distribution closer to the bulk of the data, and to have the variable be normally distributed.

Since the budgets of one year are often used to set the following year's budget, a one-year lag of the dependent variable is included in the equation. Dummy variables for each year are included to control for exogenous time factors.

To assess unionization's potential impact on changes in budgets, I also model the impact of unionization on the annual change in direct educational costs and core expenses.

The two change models use the following equation:

$$\begin{aligned} \text{Percent Change } (Y)_{it} = & \alpha_i + \text{Union } \beta_{it} + \text{Selectivity } \beta_{it} + \text{Size } \beta_{it} + \text{Republican } \beta_{it} \\ & + \text{Carnegie } \beta_{it} + \text{Reg_Structure } \beta_{it} + \text{PerCapitaGDP } \beta_{it} + Y\beta_{it} + \text{Partisan Structure } \beta_{it} \\ & + \text{Year Dummies } (1 - 23) \beta_{it} + \varepsilon_{it} \end{aligned}$$

where Y is annual percentage change ($[(Y_n - Y_{n-1})/Y_{(n-1)}] * 100$) in the direct instructional costs or core expenses for public four-year institutions adjusted for inflation and the cost-of-living differences between states. Because percentage change is affected by the size of the variable, I include the absolute value for direct educational cost and core expenses in the equation. Year dummies are again included to control exogenous time-related factors.

Hypotheses. Labor costs are the largest expense for any university. If critics of unionization are correct, we would expect unionized institutions to be less efficient than institutions that are not unionized. That is, all thing being equal, the budgets of unionized schools should be higher than non-unionized institutions. A second hypothesis is that given their emphasis on cost-cutting over revenue generation, one would expect schools in Republican-dominated state governments to have lower expenditures than school in states where Republicans are less dominant. Also, one would expect wealthier states (as measured by per capita GDP) to have the flexibility and capacity to spend more on public universities than poorer states. Third, one would expect the size of the institution and

selectivity to be positively associated with school expenditures, i.e. the more selective a school and the larger a school the more costly it is likely to be. Finally, Partisan Structure combines Knott and Payne's institutional control variable with Republican control of state government. The expectation is that in states that are high centralized and highly Republican, one would expect greater cuts in higher education and lower core expenses.

Table 1 here

Results. The results of the analysis across four models suggest that unionization is positively associated with efficiency. The results are presented in Table 1. The union coefficients for the two budgetary variables are negative and statistically significant even after controlling for last year's budget. This means that a positive change in the union status of a university on average *reduces* a university's direct educational costs and core expenses. Similar results occur when examining the impact of unionization on the rate of change in direct instructional costs and core expenses. Unionization, on average, contributes to a nearly one percent reduction in the growth of core expenses and educational costs.

The relationship between the control variables and the dependent variables are largely as expected. The selectivity of an institution is statistically significant and negatively related to the two budget measures, i.e. as the institution becomes less selective (higher proportion of applicants are admitted) the cost and expenses of an institution decline. At the same time, the relationship of selectivity to a change in costs and expenses is not statistically significant. Size also matters. Larger institutions are more costly and expensive than institutions with fewer students.

Political, economic, and administrative variables demonstrate mixed results. There is a negative and statistically significant relationship in three of four models between Republican control of government, suggesting that Republican-controlled state governments contribute to lower instructional cost and lower core expenses. Per capita GDP is positively related and statistically significant in three of four models, suggesting support for the hypothesis that public universities in wealthier states spend more than schools in poorer states. And finally in one of the models, “Partisan Structure” the interactive variable connecting Republican control with Knott and Payne’s institutional variable is positively related to budgets and statically significant.

III. UNIONIZATION’S IMPACT ON EFFECTIVENESS

In addition to claiming that unions drive up costs and lower efficiency, critics of unionization argue that unions undermine effectiveness. Some economists argue that unions impose rigid hiring and promotion rules that limit an organization’s flexibility and keep unproductive employees in their jobs. Teachersunionexposed.com, one of a number of anti-union lobbying organizations, captures the view:

America’s teachers unions — particularly the National Education Association and the American Federation of Teachers — are the most organized and powerful voices in education politics. These unions continue to block reforms needed to improve our nation’s schools by putting their focus on teachers rather than on the students they teach.

An opposing view is also found in academic research. Scholars note that unions improve working conditions, accountability, wages, and transparency – all factors linked to more effective organizational outcomes. Indeed, it is precisely when reforms are needed that

unions help ensure that change will not be arbitrary or capricious. Diane Ravitch, a senior fellow at the Brookings Institution, captures the view:

The union is thus necessary as a protection for teachers against the arbitrary exercise of power by heavy-handed administrators. In our school systems, as in our city, state, and federal governments, we need checks and balances. Just as the executive, legislative, and judicial branches of government all act as checks on each other, we need checks and balances in our school systems.

<http://www.aft.org/newspubs/periodicals/ae/winter0607/ravitch.cfm>

Thus, as with efficiency, scholars differ on the impact of unionization on effectiveness which, in turn, contributes to different expectations about the impact of unions in higher education.

Three Models of Effectiveness. As noted above, there are many ways to measure effectiveness. Fortunately, the Delta Cost Project data include a complete set of commonly used outcome measures for the time period of this analysis. To measure unionization's impact on university effectiveness I select three different dependent variables: 1) graduation rate of students who finish within 150 percent of normal time; 2) # of degree award per 100 FTEs; and 3) # of completions per 100 FTEs. The dependent variables are then modeled using the following equation:

$$(Y)_{it} = \alpha_i + Union \beta_{it} + Selectivity \beta_{it} + Size \beta_{it} + Republican \beta_{it} + Carnegie \beta_{it} + Reg_Structure \beta_{it} + PerCapitaGDP \beta_{it} + \log(Y)_{i,t-1} + Republican * Reg_Structure \beta_{it} + Year Dummies (1 - 23) \beta_{it} + \epsilon_{it}$$

where Y is the outcome variable.

Hypotheses. If critics of unionization are correct one should expect universities with unions to perform worse than universities that do not have unions. That is, all things being equal, unionized schools should have lower graduation rates, degrees awarded, and completions. One would also expect other control variables to influence educational outcomes. One would expect more selective institutions to perform better than less

selective institutions. One might expect wealthier states to generate more effective university outcomes. At the same time, it's less clear how the size of an institution, the partisan composition of state government, or the type of regulatory system might influence the effectiveness of public universities.

Table 2 here

Results. The results are presented in Table 2. The analysis finds little support for the view that unions hinder a university's effectiveness. On the contrary, unionization is positively associated with graduate rates, degrees awarded and completions and the relationship is statistically significant. Unionization, for example, leads to a nearly 1 percent increase in the graduation rate of a school and is linked to an additional completion and degree for every 100 students. High selectivity contributes to higher graduation rates and a greater number of degrees and completions. Larger institutions are associated with slightly higher graduation rates but lower number of degrees and completions. Wealthier states, measured in terms of per capita GDP, contribute to a larger number of degrees and completions, and better graduation rates. The variable Partisan Structure which combines Republican*Regulatory Structure is negatively associated with degrees awarded and completions but positively associated with graduation rates.

IV. CONCLUSION: EMPHASIS ON INSTRUCTION OVER ADMINISTRATION

The central findings of this research are provocative and run against the grain of some common expectations concerning the influence of unions on university budgets and performance. The analysis finds that unions contribute to a more efficient and effective university. Unionized institutions show lower costs and expenses even after controlling

for the previous year's budget. In addition, the rate of cost increases is lower in unionized institutions. At the same time, unionization is positively linked to higher graduation rates, and a higher number of completions and degrees. The results, while significant, raise more questions than they answer. What contributes to these outcomes? What are unions doing that leads to lower costs and better performance?

The Delta Cost Project dataset does not allow for a micro-level examination of how unions influence university policies. Qualitative analysis may be needed to discern the organizational mechanisms at play at various institutions. However, two measures in the dataset offer a window into a possible answer. One measure "Instruction share," captures the share of education and related spending on instruction. A second measure, "Administration share" captures the portion of spending on academic support, institutional support, and operations and maintenance ascribed to the education function. To the degree that budgets reflect priorities, the budgetary share for administration and instruction offer a snapshot over time of what the university believes is the appropriate balance between administration and instruction. That balance may provide an answer to the puzzle posed by this research.

Benjamin Ginsberg's book *The Fall of the Faculty: the Rise of the All-Administrative University and Why It Matters* (Oxford University Press, 2011) analyzes the sharp rise in administration at universities. Between 1975 and 2005 the number of faculty grew by 51 percent while during that same time, administrators and administrative staffers grew 85 percent and 240 percent, respectively (p. 25). The spike in administration affects university performance in two important ways: one, as the share

of administrators to faculty rises, university budget become bloated since administrators are typically paid well above the average faculty member. Ginsberg notes:

Administrative salaries are on the rise everywhere in the nation. By 2007, the median salary paid to the president of a doctoral degree-granting institution was \$325,000. . . Somewhat more difficult to explain is the fact that by 2010, even some of the ubiquitous and largely interchangeable deanlets and deanlings earned six-figure salaries. (p. 25).

In addition to higher costs, the administration-dominated university is characterized by poor performance partly because administrators often lack substantive expertise in areas in which they exercise control and partly because administrators rarely remain at the institution for more than five years. Kent State University, for example, has had six Deans of Arts and Sciences since I arrived in 1996. The current office holder is an interim dean, hired after the preceding interim dean took another job elsewhere.

Ginsberg writes:

College administrators are usually better at inventing or seizing control of activities than managing them effectively. When administrators take control of a program from the faculty they often ruin it, since they typically know far less about the program and less commitment to it than its original faculty directors.” (pp. 35-36).

In short, Ginsberg’s research suggests one possible explanation for why costs and budgets might rise at a university while performance falters: the heavy mix of administration to faculty. The question is whether unionization, a variable Ginsberg does not include in his analysis, plays a role in shaping the balance between administration and instruction on campus. To address the question I use two models built around a similar set of control variables used in earlier analyses:

$$(Y)_{it} = \alpha_i + Union \beta_{it} + Selectivity \beta_{it} + Size \beta_{it} + Republican \beta_{it} + Carnegie \beta_{it} + Reg_Structure \beta_{it} + PerCapitaGDP \beta_{it} + \log(Y)_{i,t-1} + Republican * Reg_Structure \beta_{it} + Year\ Dummies\ (1 - 23) \beta_{it} + \epsilon_{it}$$

where Y is the percentage of the education-related spending devoted to: 1) instruction and 2) administration.

The central hypothesis is that unionized institutions faculty play a more central role in managing the university. Indeed, much of what is negotiated in a collective bargaining agreement centers on issues of governance. Thus, in unionized institutions I expect a higher percentage of the education-related budget to be devoted to instruction than in non-unionized institutions. Relatedly, in unionized institutions I expect a lower percentage of the education-related budget to be devoted to administration than in non-unionized institutions.

Table 3 here

Results. The analysis in Table 3 reveals that unionization has a statistically significant impact on the budgetary mix between administration and instruction. Unionization leads universities to emphasize instruction over administration. The budgetary share of administration declines by .5 percent with unionization. At the same time, unionization leads to a one percent increase in the instructional share of the budget. One can see the relationship graphically in Figures X and Y.

Figure 2 Here

Figure 2 compares the mean share of administration between unionized and non-unionized schools over time for all four-year public institutions. The graph illustrates that at no point have unionized institutions devoted more of their budget to administration than non-unionized institutions. Moreover, the difference is typically two to three percent; a sizeable amount given that university budgets can often exceed \$500 million.

Figure 3 Here

Figure 3 compares the mean share of instruction between unionized and non-unionized schools over time for all four-year public institutions. The graph illustrates that the overall share of resources devoted to instruction as declined over time. At the same time, unionized schools consistently devote a much higher proportion of their budget to instruction than non-unionized schools. And again, the difference can be as high as four percent. Were one to break out the comparisons of administration and instruction by the size of school it is likely that differences between union and non-union institutions would be even greater for the medium and larger institutions.

In sum, this research began with one puzzle and ended with another. The paper began with the question Kim Cameron posed nearly 25 years ago: What impact does unionization have on university performance? The empirical analysis included several measures of university performance that reflected values of efficiency and effectiveness. Based on the experience of 432 public four-year institutions over 23 years, I find that unionization improves efficiency and effectiveness. Unionization contributes to lower budgets, higher graduation rates, and a greater number of degrees and completions. These finding prompted the further question: How is it possible to have a less costly institution with better outcomes?

There are likely to be numerous ways in which unions affect the costs and quality of a university. Most of the linkages, however, require more in-depth qualitative studies. The Delta Cost Project Data, however, included information on the budgetary mix of administration and instruction. Drawing on the work of Benjamin Ginsberg and others I considered what role if any unionization plays in influencing the share of university resources that are devoted to administration and instruction. Not surprisingly,

unionization is positively related to a higher percentage of the budget devoted to instruction and lower percentage to administration. What makes this finding particularly interesting is that it suggests union influence on university performance may be indirect as well as direct. In other words unions may influence how universities perform by influencing the university's priorities regarding instruction and administration.

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Table 1: Unionization's Impact on Higher Education Budgets				
Variables	Log of university instructional costs	Annual rate of change in university instructional costs	Log of core expenses	Annual rate of change in core expenses
Union	-0.00798***	-0.9774***	-0.00566***	-0.7746***
Selectivity of Institution	-0.0178***	-0.0347	-0.0162***	0.063
Size of Institution	0.0111***	-0.1647	0.0103***	-0.2295*
Republican Control of State Gov.	-0.0206***	-2.7930**	-0.0027	-0.8706*
Knott and Payne Structural Controls	-0.0017	-0.2560	-0.000078	-0.0159
State GDP Per Capita	7.44e-07***	0.000064*	1.06e-06***	0.00008***
Carnegie 2005	-0.00085	-0.0821039	-0.00053	-0.0548
Lagged Dependent Variable	0.9851***	_____	0.9831***	_____
Original Budget Variable	_____	1.08e-09*	_____	1.43e-09*
Partisan Structure	0.0048*	0.5665141	0.000064	0.0821
Year dummy variables 1-23				
Constant	0.2816***	3.8328	0.2915***	1.9532
Groups	432	432	432	432
Observations	9461	9461	9461	9461
Within R ²	0.9790	0.1017	0.9857	0.0945
Between R ²	0.9998	0.0220	0.9998	0.0243
Overall R ²	0.9963	0.0989	0.9969	0.0914

*p < .05. **p < .01. ***p < .001.

Variables	Degrees per 100 FTEs	Completion per 100 FTEs	Graduation Rate
Union	0.5472**	0.6987***	0.0158*
Selectivity of Institution	-3.3217**	-3.2207**	-0.1694***
Size of Institution	-0.3780***	-0.3492***	0.0101***
Republican Control of State Gov.	1.4408***	1.3520***	-0.0366***
Knott and Payne Structural Controls	0.0372	0.0668	-0.0083
State GDP Per Capita	0.0001***	0.0001***	4.25e-06***
Carnegie 2005	-0.8258***	-0.7889***	-0.0126***
Partisan Structure	-0.4013***	-0.3706***	0.0129***
Constant	23.2487***	22.9711***	0.4332***
Groups	432	432	429
Observations	9892	9892	3396
Within R ²	0.1075	0.1799	0.0376
Between R ²	0.1812	0.2084	0.1774
Overall R ²	0.1617	0.2003	0.1667

*p < .05. **p < .01. ***p < .001.

Variables	Administration Share of Educational Costs	Instructional Share of Educational Costs
Union	-0.0047*	0.00976***
Selectivity of Institution	-0.1058***	0.0952***
Size of Institution	-0.0086***	0.0106***
Republican Control of State Gov.	-0.0037	0.00036
Knott and Payne Structural Controls	-0.0012	0.0004
State GDP Per Capita	-1.10e-07	-6.89e-08
Carnegie 2005	0.0120***	-0.0162***
Partisan Structure	0.00341***	-0.00429***
Year 1-23		

Constant	0.4234***	0.4897***
Groups	432	432
Observations	9894	9894
Within R ²	0.0223	0.0751
Between R ²	0.3335	0.3611
Overall R ²	0.2799	0.3198

*p < .05. **p < .01. ***p < .001.

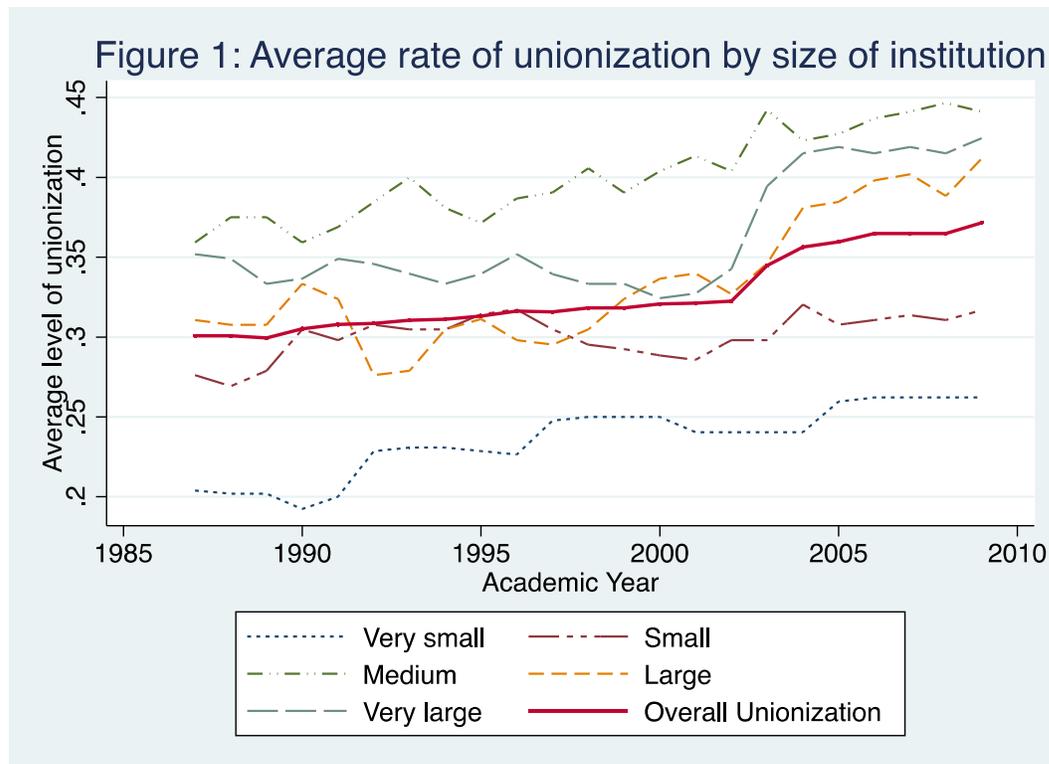


Figure 2: Administrative Share of Educational Costs

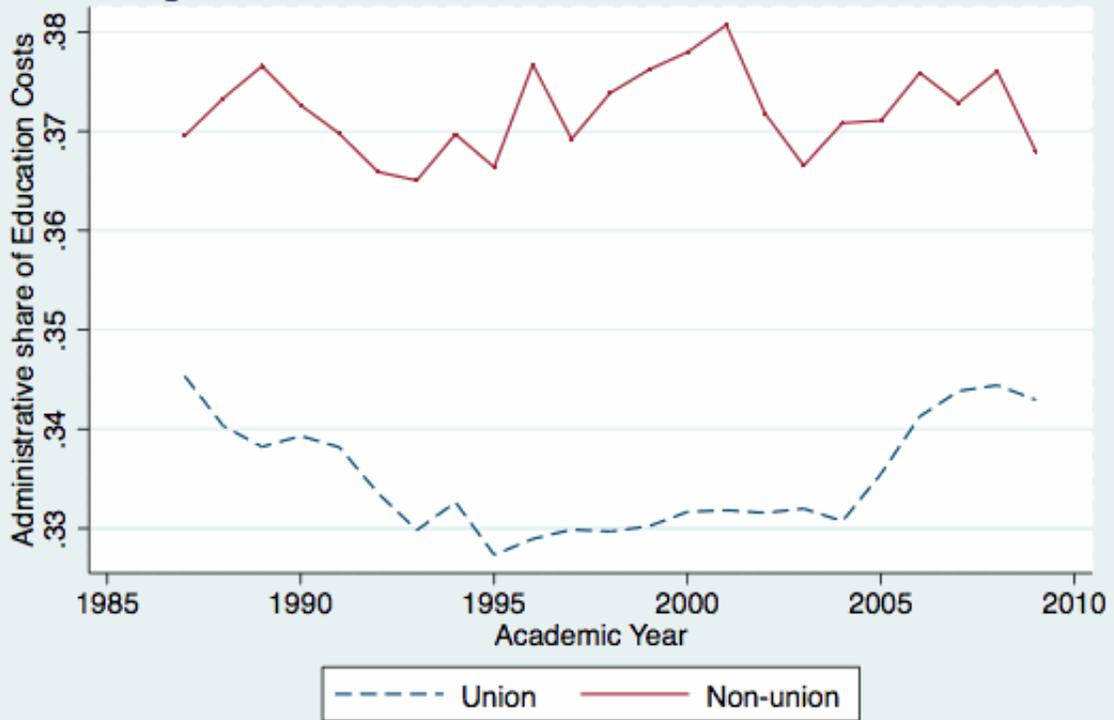
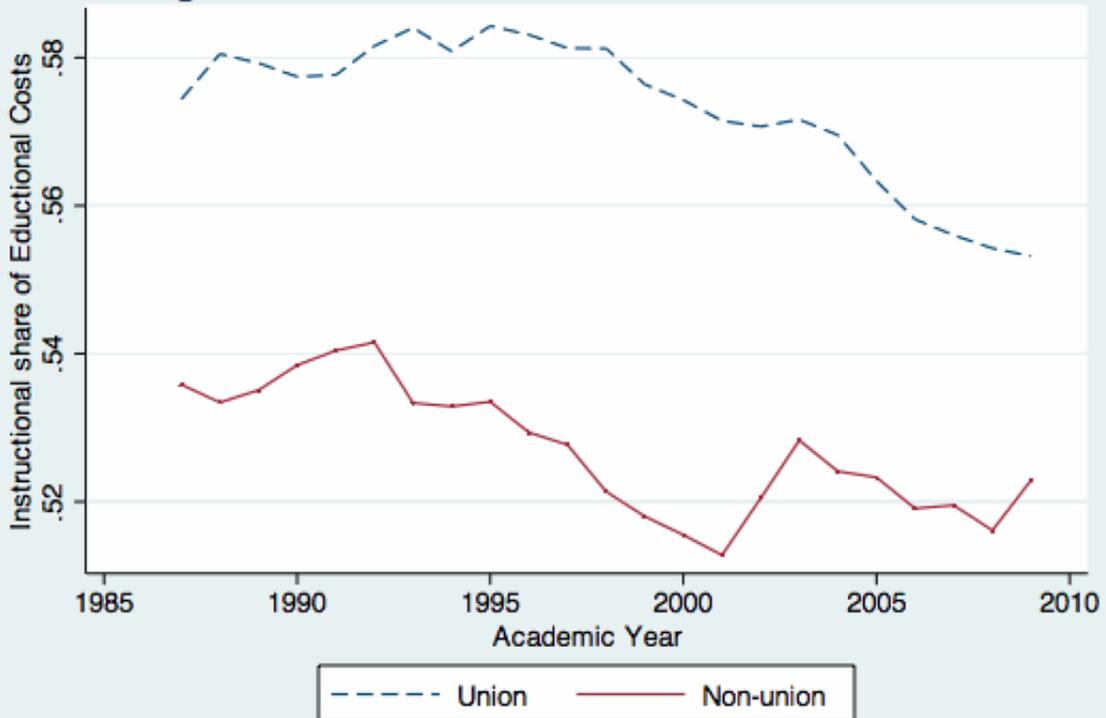


Figure 3: Instructional Share of Educational Costs



Appendix 1

Variable	Observations	Mean	Standard Deviation	Description and Source
Core Expenses	11847	1.78e+08	3.19e+08	Total education and general expenditures includes all core operating expenditures, including sponsored research, but excluding auxiliary enterprises. This variable was originally reported in IPEDS, but for recent years it is calculated by summing expenditures on instruction, research, public service, academic support, student services, institutional support, operations and maintenance, and scholarships and fellowships. Source: Delta Cost Project
University Instructional Costs	11939	1.08e+08	1.77e+08	Total education and general expenditures includes all core operating expenditures, including sponsored research, but excluding auxiliary enterprises. This variable was originally reported in IPEDS, but for recent years it is calculated by summing expenditures on instruction, research, public service, academic support, student services, institutional support, operations and maintenance, and scholarships and fellowships. Source: Delta Cost Project
Administration Share	11814	0.3473522	0.0847561	The share of education and related spending on other education and related costs (the portion of spending on academic support, institutional support, and operations and maintenance ascribed to the education function). Source: Delta Cost Project
Instructional Share	11806	0.5581084	0.0984689	The share of education and related spending on instruction. Source: Delta Cost Project
Total degrees per 100fte	11922	22.28943	12.324	The total number of degrees granted per 100 full time equivalent students enrolled. Source: Delta Cost Project
Total Completions per 100fte	11925	23.39101	24.08849	The total number of completions (awards, certificates, and degrees) granted per 100 full time equivalent students enrolled.

Variable	Observations	Mean	Standard Deviation	Description and Source
				Source: Delta Cost Project
Graduation Rate	3734	0.4663928	0.1615311	Percentage of full-time, first-time, degree/certificate-seeking undergraduate students graduating within 150 percent of normal time. Normal Time to Completion - The amount of time necessary for a student to complete all requirements for a degree or certificate according to the institution's catalog. This is typically 4 years (8 semesters or trimesters, or 12 quarters, excluding summer terms) for a bachelor's degree in a standard term-based institution; 2 years (4 semesters or trimesters, or 6 quarters, excluding summer terms) for an associate's degree in a standard term-based institution; and the various scheduled times for certificate programs. Source: Delta Cost Project
Unionized	12038	0.3267154	0.4690317	National Center for the Study of Collective Bargaining in Higher Education and the Professions , http://www.hunter.cuny.edu/nscsbhep
State Control	12038	0.427268	0.3397763	Vanderbilt University, State Politics and Judiciary Code Book 1987-2005, The Council of State Governments, Book of States 2005-2009
Selectivity	9945	0.6669668	0.176803	Total admission/Total Applications. Sources: Delta Cost Project
Carnegie 2005	11841	18.71556	3.55856	The 2005 Carnegie Classification includes all colleges and universities in the United States that are degree-granting and accredited by an agency recognized by the U.S. Secretary of Education. The 2005 edition classifies institutions based on their degree-granting activities from the fall of 2003 through the spring of 2004. 1 = Associate's--Public Rural-serving Small; 2 = Associate's--Public Rural-serving Medium; 3 = Associate's--Public Rural-serving Large; 4 = Associate's--Public Suburban-serving Single Campus; 5 = Associate's--Public Suburban-serving Multicampus; 6 = Associate's--Public Urban-serving

Variable	Observations	Mean	Standard Deviation	Description and Source
				<p>Single Campus; 7 = Associate's--Public Urban-serving Multicampus; 8 = Associate's--Public Special Use; 9 = Associate's--Private Not-for-profit; 10 = Associate's--Private For-profit; 11 = Associate's--Public 2-year colleges under 4-year universities 12 = Associate's--Public 4-year Primarily Associate's; 13 = Associate's--Private Not-for-profit 4-year Primarily Associate's; 14 = Associate's--Private For-profit 4-year Primarily Associate's; 15 = Research Universities (very high research activity); 16 = Research Universities (high research activity); 17 = Doctoral/Research Universities: Doctorate-granting Universities.; 18 = Master's Colleges and Universities (larger programs); 19 = Master's Colleges and Universities (medium programs); 20 = Master's Colleges and Universities (smaller programs); 21 = Baccalaureate Colleges--Arts & Sciences; 22 = Baccalaureate Colleges--Diverse Fields; 23 = Baccalaureate/Associate's Colleges; 24 = Special Focus Institutions--Theological seminaries, Bible colleges, and other faith-related institutions; 25 = Special Focus Institutions--Medical schools and medical centers; 26 = Special Focus Institutions--Other health professions schools; 27 = Special Focus Institutions--Schools of engineering; 28 = Special Focus Institutions--Other technology-related schools; 29 = Special Focus Institutions--Schools of business and management; 30 = Special Focus Institutions--Schools of art, music, and design; 31 = Special Focus Institutions--Schools of law; 32 = Special Focus Institutions--Other special-focus institutions ; 33 = Tribal Colleges; 0 =</p>

Variable	Observations	Mean	Standard Deviation	Description and Source
				Not classified; -3 = Not applicable, not in Carnegie universe (not accredited or nondegree-granting) Source: Delta Cost Project
Size	12038	3.010052	1.419309	Categorical variable. Divides annual FTE data in to five quintiles. Source: Delta Cost Project
Knott and Payne	12038	2.672371	1.138561	Categorical variable that measures the degree of centralization in state regulatory system for higher education. Sources: Knott and Payne
Cost-of-Living Adjustment	12038	78.17978	17.34694	William Berry, http://mailer.fsu.edu/~wberry/garnet-wberry/a.html
State GDP Per Capita	12038	33372.37	8702.626	Bureau of Economic Analysis