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Abstract

The author's goal in this article is to estimate the causal effect of unionization on institutional decision-making, using a national survey of presidents and faculty senate leaders to measure the level of shared governance at 341 public universities in 15 different areas. To handle the endogeneity of faculty unionization, an index of state employee collective bargaining rights is used as an instrument for unionization. Findings indicate that unionization greatly increases faculty influence over institutional decision-making, both in compensation and in areas outside of compensation.

Keywords

instrumental variables, union voice

Cover Page Footnote

Stephen R. Porter is a Professor at North Carolina State University and a Visiting Scholar at RTI International. I thank John Curtis, Michael Mauer, Claire Porter, Paul Umbach, and participants in the Human Resources seminar of the Department of Economics at Iowa State University and the 2010 Workshop on Research Design for Causal Inference at Northwestern University School of Law for advice and comments. I also thank Henry Farber and Gabriel Kaplan for generously providing access to their data, and Clint Stephens for assistance with assembling the data sets. A data appendix with additional results, and copies of the computer programs used to generate the results presented in the paper, are available from the author at srporter@ncsu.edu.

THE CAUSAL EFFECT OF FACULTY UNIONS ON INSTITUTIONAL DECISION-MAKING

STEPHEN R. PORTER*

The author's goal in this article is to estimate the causal effect of unionization on institutional decision-making, using a national survey of presidents and faculty senate leaders to measure the level of shared governance at 341 public universities in 15 different areas. To handle the endogeneity of faculty unionization, an index of state employee collective bargaining rights is used as an instrument for unionization. Findings indicate that unionization greatly increases faculty influence over institutional decision-making, both in compensation and in areas outside of compensation.

Public sector unions are currently the focus of intense debate in the United States. Several high-profile efforts to curtail public sector collective bargaining have occurred, including the successful 2011 legislative action in Wisconsin and the 2011 Ohio union law subsequently overturned by referendum. While anti-union sentiment appears to be increasing, the defeat of the Ohio law by popular vote suggests that public sector unions will not be easily eliminated.

One segment of public sector unions has received relatively little notice by researchers: faculty unions at colleges and universities. Although the number of faculty unions increased considerably almost half a century ago, we still know little about the effects of unionization on faculty and institutions, particularly on how institutions function. The overall effect of unionization is unclear. Because of the power of collective bargaining, unions might increase faculty power over university decision-making, particularly in areas such as faculty compensation. Conversely, the legalistic approach to faculty-administrative relations that results from unionization may result in administrators unwilling to informally cede power to faculty, unless such power is specifically spelled out in the collective bargaining agreement, resulting in a loss of influence after unionization.

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My goal with this article is to estimate the causal effect of unionization on institutional decision-making. I use a national survey of presidents and faculty senate leaders to measure the level of shared governance at an institution, and estimate the effect of unionization using an instrumental variables (IV) approach and state unionization laws. Such an approach is necessary if a simultaneous relationship exists between governance and the presence of a faculty union on campus. A common finding in the case study literature is that faculty often unionize not only as a response to low salaries but also as a result of frustration with their input into university decision-making. If faculty unions form in part due to low levels of involvement in decision-making, standard regression analysis will yield biased estimates of the effect of unionization.

Background

I assume that faculty vote to form a union to increase their collective welfare (Hosios and Siow 2004). Union formation and the presence of a collective bargaining agent allow faculty to extract concessions from the university administration. The ability of a faculty union to influence the university lies in its ability to strike (in some states), to enact informal sanctions against the university that result in costs other than what would occur under a formal strike, and to increase faculty voice in governance.

The formation of a union may allow faculty to make a credible threat to strike in a few states, with the potential of disrupting and even shutting down a university if their demands are not met. While faculty strikes are not widespread in the United States, they do occur almost annually; 163 faculty strikes occurred at two-year and four-year institutions during the period 1966 to 1994 (Annunziato 1994). In 2011, faculty voted to strike at campuses of Long Island University, Mt. Hood Community College, and Youngstown State University (Huckabee 2011a; Medina 2011; Schmidt 2011), while faculty actually went on strike at Cincinnati State Technical and Community College and Southern Illinois University at Carbondale (Hebel 2011; Huckabee 2011b). Most recently, members of the union representing California's 23-campus state university system voted to authorize a series of two-day rolling strikes after two years of unsuccessful negotiations (Schmidt 2012).

Nonetheless, the ability of faculty to strike is limited at most universities. Public sector employees are legally permitted to strike in only nine states (Kearney 2009), and many faculty collective bargaining agreements contain specific "no strike" clauses (DeCew 2003). Some collective bargaining agreements contain severe penalties for violating these clauses, permitting the university to fire striking faculty or requiring the union to reimburse the university for expenses and damages that occur due to a strike (Johnstone 1981). Thus, the influence of faculty unions must depend on more than the ability to strike, because the strike threat is not credible for many faculty unions.

Even if faculty at an institution cannot strike, administrators will still be motivated to negotiate concessions with the union, rather than ignore their demands. Faculty can make life difficult for administrators, without resorting to a strike, through their refusal to participate in activities such as faculty recruitment and administrative committees; Donald Wollett (1973) referred to these types of sanctions as “academic sabotage.” Although faculty strikes are illegal in Massachusetts, for example, in 1997 members of the state college faculty union stopped participating on some administrative committees “on the theory that this was individual, voluntary activity that could be suspended without crossing the line into an illegal work stoppage” (Art 2006: 285). More common than work slowdowns are contract campaigns, in which union members engage in a variety of activities to pressure the administration to agree to their terms (Mauer 2006). These activities include campus events, attempts at influencing the media, and public demonstrations.

Because highly visible faculty protests and other pressure tactics may harm the public image of the university, senior university administrators have an incentive to grant at least some concessions to the union. The sociologist Gaye Tuchman (2009) has argued that senior university administrators work at their current jobs with an eye on their next position, leading to a focus on short-term solutions that they can tout when interviewing. Being known for presiding over a bitter dispute with faculty that results in negative publicity for their university will not be seen as a plus for ambitious administrators seeking to advance in their profession. In addition, faculty union negotiations tend to be much more drawn out than negotiations in the private sector, sometimes stretching over years. Such lengthy negotiations impose a time and resource cost on the university administration that gives them an incentive to reach an agreement with the union. The ability of faculty unions to gain concessions also lies in the collegial nature of academic institutions. Most senior administrators involved in bargaining are former faculty members, sharing common interests with faculty on the other side of the bargaining table (see e.g., Cameron 1991).

Finally, faculty unions serve an organizing capacity that increases faculty voice both inside and outside the university. While faculty senates are known for being “notoriously ineffective in advancing faculty interests” (Kemerer and Baldrige 1981: 262), unions have been much more successful in organizing like-minded faculty together. Unions provide a way for faculty to speak with one voice not only to the administration but also to outside actors such as state legislatures. This ability is vital, because the legislature ultimately makes decisions on faculty wage increases (Freeman 1978); faculty unions can influence institutional outcomes through political lobbying efforts (Hedrick, Henson, Krieg, and Wassell 2011). Unions also serve as credible representatives that can publicize negative actions on the part of the university administration to external groups, such as the American Association of University Professors, which in turn has the ability to censure institutions.

Because public sector unions typically focus on compensation during collective bargaining (Kearney 2009), it may not seem immediately obvious that faculty unions should increase faculty influence over administrative decision-making, particularly in areas outside compensation. Case studies of faculty unionization, however, indicate that lack of input into decision-making can play as large a role as low salaries in unionization efforts (Arnold 2000; Martinello 2009). Victor Baldridge and Frank Kemerer noted that "it is standard practice for most faculty unions to demand decision-making rights in areas other than just economic. . . . Virtually all faculty unions also eventually seek to expand their jurisdiction into areas traditionally considered the territory of senates, departments, and administration" (1976: 405; see also Wickens 2008).

If faculty unions do seek influence over non-pecuniary as well as pecuniary areas of the university, then non-pecuniary factors should play a role in why individual faculty support unions. Empirical studies of how faculty vote in union elections show that while dissatisfaction with pay is a substantively significant predictor of a positive vote, satisfaction with other aspects of campus life also affects union support. Faculty are more likely to vote for unionization when they distrust the administration, are dissatisfied with the fairness of administrative policy and the amount of participation in governance, and are dissatisfied with other aspects of their job, such as teaching duties and facilities and support services (Bornheimer 1985; Dworkin and Lee 1985; Hemmasi and Graf 1993; Goldey, Swank, Hardesty, and Swain 2010). Research also shows that faculty unions are perceived as being instrumental in achieving higher salaries as well as increasing faculty control over the administration and increasing faculty input in formulating policies (Rasuli and Karim 1999). One common theme from these studies is that faculty pursue unionization not only to increase compensation but to affect other aspects of their work life as well.

Faculty collective bargaining agreements reflect the disparate concerns of unionized faculty. One analysis of 41 faculty collective bargaining agreements found, not surprisingly, that 100% contained provisions dealing with salaries and fringe benefits, and 78% dealt with promotion and grievance procedures. Yet over half of the agreements dealt with chairperson selection, and a third with budget cutback procedures (Ponak, Thompson, and Zerbe 1992). An analysis of 294 faculty collective bargaining agreements found that governance issues were mentioned in one-third of the agreements; the language used in some of these ensured faculty involvement in shared governance in addition to areas such as the use of financial resources and long-range planning (Maitland and Rhoades 2001).

Empirical research on the effects of faculty unions has focused almost solely on compensation, with two studies looking at promotion and tenure, both finding positive effects. Ann Maria May and colleagues found that unionized institutions have a higher proportion of female faculty at the ranks of associate and full professor, which they attribute to "the role of unions in formalizing tenure and promotion procedures and providing

faculty with greater opportunities to pursue grievances” (May, Moorhouse, and Bossard 2010: 713). Daniel Rees (1994) reported similar findings for all faculty.

The literature on unions and compensation is somewhat mixed, with some studies having found that unionized faculty earn more than nonunionized faculty (Birnbaum 1974; Barbezat 1989; Ashraf 1992, 1997; Rees, Kumar, and Fisher 1995; Monks 2000; Benedict 2007), while others found little difference (Kesselring 1991; Rees 1993; Hosios and Siow 2004). Most of the positive studies found the unionization effect to be very small, generally only a few percentage points of salary. Important to note is that these studies generally do not take into account unobserved heterogeneity between institutions. Recent studies using panel data have found that unionization has no apparent effect on the level of faculty compensation (Martinello 2009; Hedrick et al. 2011).

These negative findings have caused researchers to speculate that faculty form unions to obtain non-pecuniary benefits, including job protection and greater say over institutional operations (Martinello 2009; Hedrick et al. 2011). This view fits with the case study and faculty voting literature on why faculty unions form. However, I note that studies looking at the impact of unionization on compensation generally focus on the *mean* level of compensation between unionized and non-unionized institutions, rather than on the effect of unionization on the *distribution* of compensation.

Arthur Hosios and Aloysius Siow (2004) posited a theoretical model in which unions change overall faculty compensation by redistributing funds from well-paid, more productive faculty to poorly paid, less productive faculty, leaving the average level of compensation unchanged. This redistribution occurs due to the nonprofit nature of academic institutions—there is no profit to be shifted away from stockholders to workers, as in the private sector. Instead, their model assumes that only the distribution of resources within an institution can be changed. In their study of Canadian universities, Hosios and Siow interpreted the salary compression across ranks that occurred after unionization as evidence in favor of their model. Felice Martinello (2009) made a similar argument, and found that unionization resulted in a redistribution of compensation in favor of older faculty. These studies suggest that unions increase faculty influence over compensation, but in ways that may not be easily detected when analyzing only mean differences in compensation.

In sum, multiple strands of research suggest that faculty unions have traditionally pursued influence within institutions far beyond the determination of salary. The empirical literature on the effects of faculty unions has focused on compensation, finding small or no apparent effects, although most of these studies have not looked at how the distribution of compensation changes after unionization. In this article I seek to build on the literature by analyzing the effect of unionization on faculty influence, not only for compensation but for other areas of institutional decision-making as well.

Methodology

I use a 2001 survey on faculty governance that was sent to presidents and faculty leaders at every four-year institution accredited to grant bachelor's degrees in the liberal arts (Kaplan 2004). The institutional response rate was 68%, with 903 private and public universities and colleges having at least one respondent to the survey. I focus on a subset of schools, those with a Carnegie classification ranging from bachelor's to research university (thus excluding specialized institutions such as seminaries included in the original survey). Given these exclusions, the final sample size is 341 public institutions.¹ For institutions with more than one respondent, I averaged the responses to create one record per institution, with weights to reflect the number of respondents per institution.

To identify the effect of faculty unions on decision-making, I require an exogenous source of variation in unionization. Unionized institutions likely differ from nonunionized institutions in ways that are unobservable, at least in terms of the typical higher education data sets available for analysis. For example, faculty political beliefs, distrust of campus administrators, and satisfaction with employment conditions may affect both the probability of unionization (Bornheimer 1985; Dworkin and Lee 1985; Hemmasi and Graf 1993; Goldey et al. 2010) and the amount of effort faculty exert when attempting to influence institutional decision-making. In addition, as stated above, evidence indicates that lack of influence is one of the factors that lead faculty to unionize. Both omitted variables and simultaneity suggest that faculty unionization is endogenous in a model with faculty influence on decision-making as the dependent variable.

I use the legal framework for academic unions as a source of exogenous variation, as used in the general union literature and teacher union literature. Faculty unions are subject to both federal and state law. In terms of federal law, faculty union activity at private universities falls under the purview of the National Labor Relations Board (NLRB) and relevant court decisions. The most relevant decision to date is the 1980 Supreme Court ruling in *NLRB v. Yeshiva University*, in which the court ruled that faculty at private universities could not unionize if they were managerial employees (Thomas and McGehee 1994; Metchick and Singh 2004). Whether faculty can be considered managerial employees hinges on the amount of influence they have on institutional decision-making. The amount of influence can be fairly minimal; in one case, faculty had no say in hiring and tenure decisions but were ruled managers because they had influence over the curriculum and other academic areas (Shaw 2006). Given that faculty unionization at private institutions depends on the amount of say they have over how the institution is governed, it makes little sense to study the effect of faculty unions on decision-making for privates: by definition, unions can occur at

¹Approximately 2 to 3% of respondents did not fill out one or more of the decision-making questions described below; their missing data were handled with multiple imputation (Allison 2001).

*Table 1. Distribution of Faculty Unions
by Year of Agent Recognition*

<i>Time period</i>	<i>Sector</i>		<i>Total</i>
	<i>Private</i>	<i>Public</i>	
1965–1969	0	20	20
1970–1974	20	55	75
1975–1979	14	68	82
1980–1984	0	23	23
1985–1989	0	1	1
1990–1994	1	6	7
1995–1999	0	5	5
2000–2004	0	5	5

private institutions only when faculty have such minimal influence that they would be viewed by the NLRB as regular employees (such as custodians and secretaries) rather than managers.² Thus, I exclude privates from the analysis and focus only on public universities. Table 1 shows the distribution of faculty unions at four-year public institutions by year of recognition.

Academic unions at public institutions fall under state law, and I use variation in state laws regulating the unionization of state employees as an instrument for the presence or absence of a faculty union at a university. The data are from 2000 and are taken from Farber's (2005) updated version of the Freeman and Valletta (1988) NBER Public Sector Collective Bargaining Law Data Set. Richard Freeman and Robert Valletta created an 8-category classification of state laws measuring the strength of collective bargaining rights for a variety of public sector workers, including state employees. The classification ranges from low to high as follows:

1. Collective bargaining prohibited
2. No provision
3. Collective bargaining permitted
4. The right to meet and present offers
5. Employer duty to bargain, express or implied with no specific dispute settlement mechanism
6. Duty to bargain with fact-finding or mediation required
7. Duty to bargain with strikes allowed
8. Duty to bargain with arbitration required

In the Appendix, I describe in more detail the validity and strength of this instrument, particularly within the local average treatment effect framework advocated by Angrist, Imbens, and Rubin (1996).

The dependent variable is taken from a series of questions that asked respondents to describe the extent of faculty influence on institutional

²There are a handful of exceptions to this rule. Universities may voluntarily recognize a faculty union, even though the university would prevail in having the union decertified in an NLRB hearing. This has been a rare occurrence; see, for example, Schneider (1998).

Table 2. Wording of Survey Question on Faculty Influence

Below you will find 15 items describing decisions regularly made on a campus. For each of the decisions listed, please indicate in the relevant box the percentage of faculty whose participation in the decision takes the form indicated. For each question, focus on the practice of the last 5 years. Note that the sum of the figures in each row should be 100% for questions 1–15.

Example: If in the selection of the department chair, 25% of the institution's faculty are in departments or divisions in which they elect the chair, 60% in departments or divisions with chairs appointed by the administration after consultation with faculty, and 15% in departments or divisions which have chairs appointed unilaterally by the administration, then the responses to this question would appear as follows:

	Determination	Joint Action	Consultation	Discussion	None
	<i>Faculty authority and determination</i>	<i>Between faculty and administration</i>	<i>Administration consults with the faculty</i>	<i>Administration explains decisions to faculty</i>	<i>No faculty participation</i>
10. Selection of department chair	25		60		15

decision-making for 15 different items using a 5-point Likert scale, for which influence could range from full faculty determination to no faculty participation. Unlike the typical Likert scale, respondents were asked to place the percentage of faculty on their campus in each category (see Table 2 for question wording). This approach is somewhat unusual, but it allows for a finer discrimination between institutions, particularly those where faculty governance is not homogeneous across the institution.³ The average proportion of schools falling into each category can be seen in Table 3. Looking at the first two columns, faculty have the most authority over the curriculum and setting degree requirements, and the least authority over construction programs, budgetary planning, and individual faculty salaries. The distributions conform to what the typical observer of American higher education would conclude about faculty influence. Namely, faculty influence on decisions about the curriculum is greater than for hiring, and much greater than for decisions about fiscal matters.

Analyzing such a dependent variable is not straightforward. One approach would be to assign weights to each category (e.g., 0 to 4) to create an overall weighted average of faculty influence. Given the ordinal nature of the scale, such weights would necessarily be arbitrary. In addition, this would treat the effect of unionization as linear, which may not be the case.

Given the five categories of responses listed in Table 2, one can create two dichotomous dependent variables reflecting how much influence faculty have on administrative decision-making at their school. First, if survey respondents indicated that 100% of faculty at their institution fell within the top three categories (determination, joint action, and consultation), then the school is coded as 1 (having at least weak influence), versus 0 for all other schools. Second, if respondents indicated that 100% of faculty had either determination or joint action, then the school is coded as 1 (having strong influence), versus 0 for all other schools. Respondents rarely indicated that 100% of faculty at their school had sole authority and determination

³Another reason for the wording of this question was to match the wording of the 1970 survey conducted by the American Association of University Professors (1971).

Table 3. Distribution of Items Measuring Faculty Influence over Decision-Making

<i>Items measuring influence</i>	<i>Determination</i> (%)	<i>Joint action</i> (%)	<i>Consultation</i> (%)	<i>Discussion</i> (%)	<i>None</i> (%)
Faculty status					
Appointments of full-time faculty	18	55	24	3	1
Tenure promotions for faculty	14	55	28	2	1
Academic operation					
Decisions about the content of the curriculum	59	33	6	1	0
Setting degree requirements	50	39	9	2	0
Academic planning and policy					
Types of degrees offered	19	55	18	5	2
Relative sizes of the faculty of various disciplines	6	27	38	21	8
Construction programs for buildings and other facilities	1	8	37	39	15
Setting of the average teaching loads	7	38	23	24	8
Selection of administrators and department chair					
Appointing the academic dean	3	33	52	9	3
Appointing department chairs or heads	17	43	33	5	2
Financial planning and policy					
Setting faculty salary scales	2	24	24	32	18
Decisions about individual faculty salaries	4	21	25	28	23
Short range budgetary planning	2	16	33	32	16
Organization of faculty agencies					
Decisions that establish the authority of faculty in campus governance	15	50	20	11	4
Selecting members for institution-wide committees, senate, and similar agencies	48	34	12	4	3

in a decision-making area. Thus, analyzing the effects of unionization on only the determination category using this approach is not possible.

The main independent variable of interest, presence of a faculty union, was created by using the *Directory of Faculty Contracts and Bargaining Agents in Higher Education* (National Center for the Study of Collective Bargaining in Higher Education 2006) and is a dummy variable indicating the presence of a faculty union for full-time faculty in 2000.

In the Appendix, I argue that public sector union laws will only be uncorrelated with the error term of the models conditional on the inclusion of two state-level covariates, political culture and the strength of the state higher education governance structure. State political culture is measured by state citizen ideology (Berry, Ringquist, Fording, and Hanson 1998). The citizen ideology measure is based on interest group ratings of individual members of Congress weighted by their vote shares, combined across districts in a state, for the year 2000.

State governance structures can be grouped into two types. Consolidated boards, which tend to have the most power to regulate public higher education, usually have responsibility over academic programs and budgets. The second type, coordinating and planning boards, may have limited power in some areas but are chiefly meant to coordinate relationships between the state government and individual institutions. As Jill Nicholson-Crotty and

Kenneth Meier noted, “Coordinating boards differ from consolidated governing boards in that they do not govern institutions and they do not appoint institutional chief executives or set faculty personnel policies” (2003: 85). Research indicates, for example, that the strength of a state’s higher education governing board can affect prices, with stronger political control resulting in lower tuition at public universities (Lowry 2001). I include a dummy variable indicating whether a state had a consolidated governing board (23 states). The data are from 1997 and are taken from McGuinness (2002).

Results

Table 4 shows the OLS and IV results for the 15 areas of faculty influence over institutional decision-making. Given the discussion in Angrist and Pischke (2009: 197–205), these models are estimated as linear probability models rather than bivariate probit models. The first two columns include OLS and IV results for the impact of unionization on weak influence (determination, joint action, and/or consultation) versus no influence, and the last two columns show the impact on strong influence (determination and/or joint action) versus almost no influence (consultation, discussion, and no participation).

In general, the IV estimates show stronger union effects than the OLS estimates. Faculty unions increase faculty influence over decision-making in a wide variety of areas, with larger effects for the weak influence category compared with the strong influence category. Turning to specific decision-making areas, unionization increases faculty influence across 9 of the 15 areas, regardless of the categorization of the dependent variable as weak or strong. In other words, faculty unions can shift faculty influence from discussion to at least consultation, and from consultation to at least joint action, for many different areas.

Areas in which faculty unions have a strong impact include faculty appointments, tenure and promotion, setting the curriculum and types of degrees offered, setting of teaching loads and appointing department chairs, setting faculty salary scales and individual faculty salaries, and decisions about faculty governance. These areas have traditionally been seen as within the purview of the faculty in U.S. higher education and encompass far more domains than just compensation. Of these areas, setting faculty salary scales has by far the largest impact, increasing the probability of an institution being classified as weak versus none by 57 percentage points and strong versus almost none by 42 percentage points. The effect sizes of unionization for the other decision-making domains are generally half these.

With the exception of setting degree requirements, areas in which unionization has little impact tend to be administrative, such as the size of faculty at the institution, construction programs, appointment of deans, budgetary planning, and selecting members of institution-wide committees. Note, however, that even here unionization has small, positive effects for weak

Table 4. Effects of Unionization on Faculty Influence: OLS versus IV

Items measuring influence	Weak influence		Strong influence	
	OLS	IV	OLS	IV
Faculty appointments	.06 (.04)	.29*** (.08)	.04 (.05)	.25*** (.09)
Tenure and promotion	.08** (.04)	.31*** (.07)	-.02 (.05)	.27*** (.10)
Curriculum	.06** (.03)	.22*** (.06)	-.01 (.05)	.25*** (.09)
Degree requirements	-.01 (.04)	.05 (.07)	-.00 (.05)	.16 (.09)
Degrees offered	.03 (.04)	.22** (.09)	.06 (.05)	.25*** (.09)
Size of faculty in disciplines	.05 (.05)	.26*** (.09)	-.02 (.03)	.07 (.05)
Construction programs	.01 (.04)	.05 (.06)	-.01 (.01)	-.03 (.02)
Teaching loads	.05 (.05)	.26*** (.09)	.13*** (.05)	.24*** (.08)
Appointing deans	.11** (.05)	.28*** (.10)	-.02 (.04)	.01 (.06)
Appointing chairs	.21*** (.04)	.51*** (.09)	.05 (.05)	.23*** (.09)
Faculty salary scales	.31*** (.05)	.57*** (.08)	.34*** (.04)	.42*** (.06)
Individual faculty salaries	.16*** (.05)	.24*** (.08)	.08** (.04)	.14*** (.05)
Budgetary planning	.14*** (.05)	.17** (.08)	.00 (.02)	-.04 (.04)
Faculty governance	.12** (.05)	.21** (.09)	.06 (.05)	.32*** (.10)
Institution-wide committees	.00 (.05)	.24** (.10)	-.03 (.05)	.08 (.10)

Notes: Cell entries are coefficients, with robust standard errors in parentheses. Equations include controls for state political culture and strength of state higher education governance; full results available on request. Unweighted n equals 341.

** $p < 0.05$, *** $p < 0.01$.

influence. Unionized faculty are more likely than nonunionized faculty to have some influence over the size of the faculty, appointment of deans, budgetary planning, and institution-wide committees. Looking at just the weak influence column, unionized faculty have significantly more influence than nonunionized faculty in 13 of the 15 domains.

Sensitivity Analysis

Including university-level covariates in the models is potentially problematic, as many of the variables used in models of higher education institutional behavior are endogenous in this context. For example, faculty are regularly consulted on issues such as spending, admissions standards, and the optimal size of the student body. Technically, such control variables are not needed given the instrumental variables approach (except to increase power), but there may be some nonresponse bias in the data due to respondents from some types of schools being more likely to respond than others.

The models are estimated in two ways. First, only the state-level controls listed above in a fully exogenous model are included, but instead of robust standard errors I cluster the standard errors at the state level, given that union laws occur at the state level. Second, I estimate a potentially endogenous model by including a group of institutional-level covariates: size (log of full-time equivalent enrollment), financial resources (log of expenditures per student), selectivity (Barron's college guidebook selectivity index, which ranges from 1 [not selective] to 6 [very selective]), age of the institution, location (urbanization scale ranging from large city to rural), and institutional mission (Carnegie classification, a classification scheme that sorts

Table 5. Effects of Unionization on Faculty Influence: Sensitivity Analyses

<i>Items measuring influence</i>	<i>Weak influence</i>		<i>Strong influence</i>	
Faculty appointments	.29** (.15)	.27*** (.08)	.25*** (.10)	.26*** (.09)
Tenure and promotion	.31** (.14)	.25*** (.07)	.27** (.12)	.19** (.09)
Curriculum	.22** (.09)	.19*** (.06)	.25** (.12)	.21** (.08)
Degree requirements	.05 (.09)	.04 (.06)	.16 (.12)	.11 (.08)
Degrees offered	.22 (.12)	.13 (.08)	.25 (.13)	.21** (.09)
Size of faculty	.26** (.11)	.27*** (.08)	.07 (.06)	.09 (.05)
Construction programs	.05 (.07)	.05 (.06)	-.03 (.02)	-.02 (.02)
Teaching loads	.26 (.16)	.21** (.09)	.24** (.09)	.18** (.07)
Appointing deans	.28** (.13)	.24*** (.09)	.01 (.07)	-.02 (.06)
Appointing chairs	.51*** (.12)	.48*** (.09)	.23 (.12)	.21*** (.08)
Faculty salary scales	.57*** (.14)	.54*** (.08)	.42*** (.09)	.40*** (.06)
Individual faculty salaries	.24** (.11)	.22*** (.07)	.14** (.07)	.12** (.05)
Budgetary planning	.17 (.10)	.23*** (.07)	-.04 (.03)	-.03 (.03)
Faculty governance	.21 (.14)	.21** (.09)	.32** (.13)	.29*** (.09)
Institution-wide committees	.24 (.13)	.19** (.09)	.08 (.11)	.05 (.09)
School-level covariates?	No	Yes	No	Yes
Clustered standard errors?	Yes	No	Yes	No

Notes: Cell entries are coefficients, with standard errors in parentheses. All equations include controls for state political culture and strength of state higher education governance, with robust standard errors when state clustered standard errors are not used; full results available on request. Unweighted n equals 341.

** $p < 0.05$, *** $p < 0.01$.

institutions based on the amount of federal research grants received and number of degrees awarded; ranges from baccalaureate college to research university). These variables are taken from the IPEDS Institutional Characteristics survey, and Barron's and Peterson's college guidebooks, all from 2000. As can be seen in Table 5, the results are similar to the results presented in Table 4, regardless of specification.

Two other potential problems may affect the results. First, the specifications in Tables 4 and 5 assume a linear relationship between the state-level covariates and the dependent variables. Correctly modeling the functional form of these variables is crucial, as the success of the identification strategy depends on it. The situation is similar to regression-discontinuity models, which depend on the correct functional form of the assignment variable. I adopt the approach used by most regression-discontinuity applications, and include squared, cubic, and interactions terms for the state-level covariates. I estimated the models from Table 4, using interaction terms between the consolidated governing board and state ideology variables, and squared and cubed terms for state ideology. The qualitative results varied little from specification to specification, compared with Table 4 (results not shown).

Second, administrator and faculty responses are combined for the analyses in Tables 4 and 5. Inspection of responses for institutions with both administrator and faculty responses reveals some wide differences in responses for individuals at the same institution.⁴ If these differences occur fairly

⁴A few institutions have responses for both the faculty senate leader as well as the head of the local AAUP chapter. I averaged these to create one response per school in Table 6.

Table 6. Effects of Unionization: Administrator and Faculty Responses

Items measuring influence	Administrators		Faculty		Significant difference?	
	Weak	Strong	Weak	Strong	Weak	Strong
Faculty appointments	.05 (.04)	.25*** (.10)	.34*** (.10)	.40*** (.12)	Yes	No
Tenure and promotion	.08** (.04)	.36*** (.10)	.29*** (.08)	.29** (.12)	Yes	No
Curriculum	.04 (.04)	.12 (.07)	.25*** (.07)	.35*** (.10)	Yes	No
Degree requirements	-.02 (.04)	-.05 (.07)	.10 (.08)	.27** (.11)	No	Yes
Degrees offered	.04 (.07)	.18* (.10)	.28*** (.10)	.22* (.12)	No	No
Size of faculty	.13 (.09)	.00 (.09)	.35*** (.11)	.17** (.08)	No	No
Construction programs	-.00 (.10)	-.00 (.04)	.15 (.09)	-.04 (.02)	No	No
Teaching loads	.19* (.10)	.29*** (.11)	.24** (.12)	.34*** (.11)	No	No
Appointing deans	.11 (.07)	-.03 (.09)	.28** (.11)	.12 (.09)	No	No
Appointing chairs	.11* (.06)	.27*** (.10)	.58*** (.11)	.32*** (.11)	Yes	No
Faculty salary scales	.56*** (.10)	.62*** (.08)	.88*** (.11)	.60*** (.08)	Yes	No
Individual faculty salaries	.20* (.10)	.27*** (.09)	.36*** (.10)	.24*** (.07)	No	No
Budgetary planning	.07 (.10)	.10 (.07)	.25*** (.09)	.06 (.05)	No	No
Faculty governance	.20** (.08)	.43*** (.10)	.14 (.10)	.17 (.11)	No	No
Institution-wide committees	.10 (.07)	.16 (.10)	.36*** (.11)	.18 (.12)	No	No
N	256	256	296	296		

Notes: Cell entries are coefficients, with robust standard errors in parentheses. All equations include controls for state political culture and strength of state higher education governance, with robust standard errors; full results available on request. Significant difference across models uses $p < 0.05$.

** $p < 0.05$, *** $p < 0.01$.

randomly, then this should not pose much of a problem for the analyses. If administrator and faculty responses differ in systematic ways, however, then the approach of combining them could be problematic.

Table 6 presents the fully exogenous model results using administrator responses and faculty responses separately. Tests for statistically significant differences across the models find five differences for the weak models and one for the strong models. Specifically, the effects of unionization on weak influence are stronger using faculty responses in only 5 of the 15 areas: faculty appointments, tenure and promotion, curriculum, appointing chairs, and setting faculty salary scales. The effects of unionization on strong influence differ only for the area of degree requirements, again with stronger effects using the faculty only sample. Combining the two sets of responses appears to be a reasonable strategy for estimating union effects on influence.

Discussion

The results presented here suggest that faculty unions have a positive effect on the level of faculty influence at public institutions. Faculty at unionized institutions have more say in decisions regarding overall salary scales as well as decisions about individual faculty salaries. They also have more influence in many other areas, such as appointments of faculty and department chairs, tenure and promotion, teaching loads and the curriculum, and governance. Faculty influence does not appear to suffer from any negative effects of

unionization. In general, the results presented here fit with several strands of literature suggesting that faculty seek to unionize in order to increase their influence over university decision-making, not just to increase their compensation.

In contrast to the literature looking at unionization and faculty salaries, the results here suggest a large impact from unionization on faculty salaries. Several explanations for these divergent findings come to mind. While it is possible that faculty might be “fooled” into thinking unions have increased their influence over the salary structure at their institutions, even though nothing has changed after unionization, Table 6 indicates that positive results for salary are found even when using the administrator-only sample. A more likely explanation is that unionization increases faculty influence over the setting of salaries, but that the main change in salary structure after unionization is in the overall distribution of salaries, rather than the mean level (Hosios and Siow 2004).

Another possibility is that faculty unions increase compensation through changing faculty workloads. Reducing teaching loads or publication expectations while holding salary constant could be viewed as an increase in compensation, in the form of a reduction in the number of hours worked with no loss in pay. The results presented here suggest that unionization increases faculty influence over decision-making about teaching loads, which fits with this explanation. A useful area of future research would be the impact of faculty unions on individual faculty behavior, particularly teaching and research productivity.

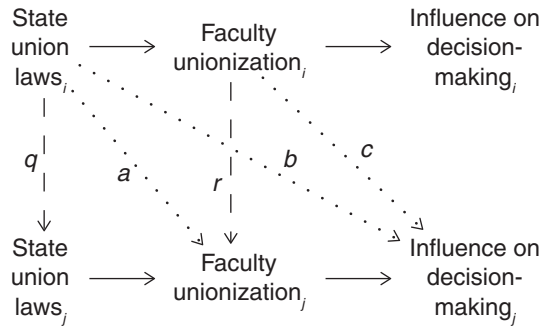
This article demonstrates the importance of properly handling the endogeneity of unionization when studying postsecondary institutional outcomes. I have presented a strong argument in favor of state employee collective bargaining rights as an instrument for university faculty unions, and use of this instrument yielded substantively significant results compared with ordinary least squares.

Finally, the findings are consistent with the view that unions have two faces, one focused on efficiency and the other on voice and governance (Freeman and Medoff 1984). Much of the work on union voice has relied on indirect evidence of the union voice effect, looking at, for example, the difference in quit rates and grievance procedures between unionized and nonunionized firms (e.g., Addison and Belfield 2007; Lewin 2007). The measure used here, faculty influence on institutional decision-making, is a more direct measure of voice, and the results indicate strong, positive differences between unionized and nonunionized institutions.

Appendix

While the use of instrumental variables in economics has historically rested on two assumptions, recent work using instrumental variables has focused on interpreting the estimated treatment effect within Rubin’s Causal Model (Holland 1986); specifically, as the Local Average Treatment Effect (Angrist et al. 1996). Such an interpretation rests on five assumptions, and I describe in detail how each of these assumptions holds for the analyses.

Figure 1. Possible SUTVA Violations



- a* - *i*'s assignment affects *j*'s treatment
- b* - *i*'s assignment affects *j*'s outcome
- c* - *i*'s treatment affects *j*'s outcome
- q* - *i*'s assignment affects *j*'s assignment (same state)
- r* - *i*'s treatment affects *j*'s treatment (same university system)

Note: Based on a graphic developed by Patrick Lam.

1. The Stable Unit Treatment Value Assumption (SUTVA) must hold. Generally, SUTVA comprises two parts, no interference between units and stable treatment and control conditions for each unit. Figure 1 illustrates potential issues of interference between units in the current application.

The figure depicts schools *i* and *j*, with bold arrows indicating the causal paths of the IV model, and the dotted arrows, *a*, *b*, and *c*, illustrating potential SUTVA violations. I first assume *i* and *j* are in different states. Arrow *a* illustrates the effect of *i*'s assignment affecting *j*'s treatment decision. Angrist et al. (1996) suggested this would occur if someone who was assigned a low lottery number (i.e., drafted) convinces a friend with a high lottery number (not drafted) to serve in the military. In this application, this outcome would occur if a change in Nebraska's public sector union laws caused the faculty at Iowa State to change their decision to unionize. Arrow *b* illustrates a similar causal path, except that *i*'s assignment affects *j*'s outcome. So a change in Nebraska's union laws would then cause a change in the demand for influence over decision-making by Iowa State faculty, or a change in the amount of influence administrators or the Iowa Board of Regents decides to grant. Both causal paths seem unlikely and thus are not SUTVA violations in this application.

Arrow *c* is probably the most common form of SUTVA violation, and illustrates spillover effects when unit *i*'s treatment affects unit *j*'s outcome. For example, this will occur if schools strategically decide to raise salaries when faculty in peer schools unionize. While this may be possible, for this application faculty or administrators in school *j* would have to change the amount of faculty influence in reaction to the unionization decision of school *i*. Schools may act strategically in terms of salary raises, but I have discovered no evidence that schools change faculty influence over decision-making due to other schools' unionization decisions. Moreover, if an administration decides to placate their faculty given a wave of unionization at similar schools, the administration would likely focus on highly visible changes. Listening to faculty during meetings or adding a position on a committee is much less visible than an institution-wide increase in faculty salaries. Thus, causal path *c* also seems unlikely.

Arrows *q* and *r* illustrate two situations in the data set that might appear to violate SUTVA, but do not. Now assuming that schools *i* and *j* are in the same state, we can see that if the union laws for *i* change, then the laws for *j* must change as well. The analogy in a random

experiment would be a cluster randomized trial, with students nested within schools and the unit of treatment at the school level; when one student in a school is assigned to an experimental group, all other students in the school are assigned to that group as well. This implies that the clustering of schools within states should be taken into account when estimating the standard errors.

Arrow r shows a causal relationship in which school i 's treatment decision determines school j 's treatment decision. While unusual, this does occur in the data set. A few of the university systems, such as California State University, voted as a system to unionize, rather than as individual campuses. Thus, it is possible that one or two schools that did not want to unionize could have been forced to unionize if outvoted by faculty in the rest of the system. Like q , this would not appear to be a SUTVA violation. Continuing the analogy of a random experiment, this would be equivalent to a participant in one experimental group persuading another participant in the same group to undergo or avoid the treatment. In this application, one could argue unionization by system might actually reduce the correlation between unobservables and unionization; presumably the schools that are forced to unionize against their will would have low values on variables such as distrust of administrators, unlike the pro-union schools.

The second part of SUTVA assumes that for each unit only one form of the treatment and one form of the control condition occurs. Here, this means there should be no variation in the treatment of unionization, which in turn raises the question, what do we mean by unionization? The definition of unionization used here is the legal one: Unionization occurs when a majority of faculty vote to support a union, the union is certified, and the faculty are then represented by a collective bargaining agent. This definition would appear to be a case of stable treatment. When we consider why a union is able to extract concessions from a university administration, however, part of the union's power derives from the ability to call a strike, which is not legal for faculty unions in all states. Binding arbitration also varies across states. There may thus be some variation in treatment if we consider union power as part of the treatment. This variation in turn implies that the estimated treatment effects will be some sort of weighted average, underestimating the effect for strong unions and overestimating the effect for weak unions.

2. The instrument (or treatment assignment) must be randomly assigned, or ignorably so (that is, can be considered random, conditional on a set of covariates). In this application, this requires us to assume that the strength of public sector collective bargaining rights is uncorrelated with the potential outcomes of level of faculty influence on institutional decision-making. This assumption would be satisfied, for example, if state public sector union laws were randomly distributed across the country. The strength of these laws, however, is driven in large part by the political culture of the state; conservative states have much weaker collective bargaining rights than do liberal states (the correlation between the Freeman and Valletta state employee index and the measure of state citizen ideology is .49). This is problematic, as political culture could be correlated with the potential outcomes. Political culture could affect internal decision-making at an institution indirectly, as faculty and administrators make decisions with the electorate and legislators in mind. Or, political culture could affect decision-making more directly, as states directly regulate the internal functioning of an institution. Most probably, the correlation would occur if faculty sort themselves across states in terms of their political beliefs; liberal faculty choosing faculty positions in liberal states, and so on.

States also vary in terms of the strength of oversight of public higher education. More powerful boards have the ability to intervene internally with the workings of institutions. If state oversight and strength of union laws are correlated, then the potential outcomes and instrument could be correlated. Both lines of reasoning imply that controls for political culture and the strength of the state higher education governing structure should be included in both stages of the instrumental variables regressions to satisfy the second assumption.

3. The instrument must have no effect on the outcome except through the treatment (exclusion restriction). Here, faculty influence at an institution must not be affected by the strength of collective bargaining rights in the state once faculty unionization status has been taken into account. I have not been able to construct a plausible example of a violation of this assumption in this context. One could construct an argument, for example, that as laws governing unionization of state employees change, faculty somehow decide to change how much input they should have at an institution. More indirectly, one could argue that as state laws change, the proportion of state employees who are unionized increases. As a result of becoming unionized, state employees for some reason demand a change in the internal governance of public universities in the state, and are influential enough to achieve this change. Both lines of reasoning illustrate alternate causal paths for state laws and faculty influence on decision-making, but neither seems plausible. A more plausible path is that union laws exert a strong, negative effect on state economies, yielding lower government subsidies to public universities, which results in a dissatisfied faculty and a change in their demand for influence on decision-making. Lonnie Stevans (2009) found limited evidence that right-to-work laws positively affect the economy of a state, so this is an unlikely causal path. While state unionization laws may vary with political culture, laws in and of themselves should not exert a direct effect on faculty input within universities, other than through the unionization of faculty.

4. There should be a nonzero average causal effect of the instrument on the treatment. In the data set, the correlation between the Freeman and Valletta index and whether a public university is unionized is .58. Because the relationship between the ordinal bargaining rights index and unionization may be nonlinear, I use seven dummy variables based on the eight-category collective bargaining rights index in the IV regressions, with the lowest category as the reference group. The partial R-square from the first-stage regressions ranges from .30 to .34, and the first-stage *F*-statistic ranges from 39 to 42. These numbers indicate there is not a weak instrument problem (Bound, Jaeger, and Baker 1995; Stock, Wright, and Yogo 2002).

5. Of the units affected by the instrument, all units must be affected in the same way (monotonicity assumption). Here, there must be no university that would unionize if state collective bargaining rights were limited (i.e., difficult to unionize), but then would not unionize if state collective bargaining rights suddenly became expansive (easy to unionize). Given the research on what drives faculty to unionize, this appears to be a plausible assumption in this context.

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