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FACULTY PREFERENCES OVER UNIONIZATION:
EVIDENCE FROM OPEN LETTERS AT TWO RESEARCH UNIVERSITIES

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Faculty Preferences over Unionization: Evidence from Open Letters at Two Research Universities
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ABSTRACT

What determines employee preferences for unionizing their workplaces? A substantial literature addresses this question with surveys on worker attitudes and pay. Unionization drives at the Universities of Minnesota and Washington have given rise to open letters of support or opposition from over 1,000 faculty at Washington and support from over 200 at Minnesota. Combining these expressions with publicly available data on salary, job titles, department affiliation, research productivity, teaching success, and political contributions from over 5,000 faculty, we provide new estimates of the determinants of faculty preferences for unionization at research universities. We find that faculty with higher pay and greater research productivity are less supportive of unionization, even after controlling for job title and department. Attitudes matter as well: after accounting for pay and productivity, faculty in fields documented elsewhere to have more politically liberal participants are more likely to support unionization.

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Substantial bodies of social science research seek to empirically explain why workers join unions or the related question of why workers would seek union representation at their firms. Economic studies tend to focus on factors such as pay and the workers' beliefs about how unionization would affect pay.¹ Psychological studies tend to emphasize general attitudinal factors, such as political beliefs, attitudes toward unionization, or dissatisfaction with one's job as possible determinants.²

While data on *aggregate* outcomes of union certification elections are widely available (see Farber, 2014), secret ballots make information on *individuals'* expressed preferences for unionization unobservable. As a result, studies of the determinants of individuals' preference for either joining unions, or unionizing their workplaces, rely on surveys asking about individuals' pay, their job satisfaction, and their attitudes toward unionization, among other possible factors. Because of the difficulties administering surveys, the literature tends to rely on relatively small samples, in addition to whatever measurement problems arise from relying on self-reports of objective information such as pay or subjective information such as general attitudes toward unionization. Even when researchers have access to survey-based measures of individuals' union sympathies, some of the other important data (such as salary, political preferences, or productivity) are typically lacking.

A confluence of circumstances has created a promising opportunity to document how preferences for unionization relate to directly observable individual characteristics such as pay as well as productivity, gender, and political attitudes. First, current faculty unionization drives have given rise to public expressions of support for unionization at the University of Minnesota,

¹ See, for example, Farber and Saks (1980), Demsetz (1993), and other studies described below.

² See, for example, Premack and Hunter (1988) and other studies discussed below.

and to public expressions of both opposition and support at the University of Washington. At Minnesota, 234 faculty members have signed an open letter in support of unionization. At Washington 837 of the faculty have signed their names to an open letter of opposition to unionization, and 327 have signed an open letter of support.³ Hence, one can observe a strong measure of union preference – and willingness to state this preference publicly – for the faculties at the Universities of Washington and Minnesota. Second, because both universities are public, their faculty salary data are publicly available, as are job titles and department affiliations as well. Third, and related, because of improving data infrastructure as well as transparency, it is possible to get systematic access to both the individual-level salary data as well as detailed public data potentially relevant to unionization preferences, research and teaching performance, and political preferences.

That is, we can obtain two measures of research productivity (the number of publications per faculty member from ISI and Google Scholar citations), a measure of teaching success (the ratemyprofessor.com rating), and a measure of political preferences – political contributions by party of candidate or PAC from the Federal Elections Commission. We are also able to classify faculty by gender using first-name frequencies from the Census, by title using the state salary data, and by academic department using the respective university directories. Given existing findings on the relationship between academic field and political leanings (Zipp and Fenwick, 2006), the department affiliations have promise as indirect measures of attitudes toward unionization. Putting these data together, we have a direct measure of unionization preference for large samples of faculty at Washington (over 3,000) and Minnesota (roughly 2,000), along with direct measures of pay, productivity, political preferences, and other factors. The data set is

³ See <http://mnacademics.org/dearcolleagues> and <http://www.uwexcellence.org/statement-of-opposition.html>

both large in comparison with the individual-level datasets used in existing studies of unionization preferences. It is also detailed and fairly objective compared with self-reports of attitudes. Using these data we can revisit the question of who supports unionization or, more specifically, which of the various potential determinants – direct factors such as pay or general attitudinal factors arising from individuals’ or fields’ political predilections – generates observed preferences for and against unionization.

While our data are of interest because they provide an unusually detailed glimpse into individual-level measures that are not usually observable, they are separately of interest because of the public-sector university context. First, while unionism is generally in decline in the US, public sector unions are growing in importance (Freeman, 1988). Second, unionization of professionals is a topic of interest in itself (Park, McHugh and Bodah, 2006). Finally, the unionization of university faculty and instructors is a topic of growing interest as universities rely more heavily on non-tenure-track instructional faculty and adjunct faculty, whose pay tends to be far lower than pay for tenure-track faculty (Dworkin and Lee, 1985; Holsinger, 2008; Goeddeke and Kammeyer-Mueller, 2009).

This paper proceeds in four sections after the introduction. Section 1 reviews the relevant existing literatures and describes the contexts of the unionization contests at the Universities of Minnesota and Washington. Section 2 discusses rationales for employee support for, and opposition to, unionization at a research university, linking these ostensible rationales specific questions that we can explore empirically (e.g. are higher-paid faculty, or more research-active faculty, more or less likely to support unionization?) Section 3 discusses the data, assembled from ten disparate sources, used in this study. Section 4 turns to empirical results. We first document bivariate relationships between openly expressed attitudes toward unionization and

salary, research productivity, teaching success, gender, and scholarly field. We then turn to regressions to find the distinct relationships between these determinants and union support. We also explore robustness to both missing values for explanatory variables as well as the possibility that those signing an open letter are not merely those who feel more strongly about unionization.

We find that salary, research productivity, and scholarly field affect unionization preference. Higher-paid faculty are less likely to support unionization. After accounting for salary, faculty who are more productive at research are less likely to support unionization. After accounting for both salary and research productivity, scholarly field matters for unionization preference. Faculty in fields documented elsewhere (Zipp and Fenwick, 2006) to be more politically liberal are substantially more supportive of unionization. After accounting for salary, research productivity and scholarly field, other factors – teaching ratings, gender, and political contributions – bear no significant relationship to union support.

I. Existing Literature and Current Context

1. Existing Literature

This study is relevant to two related but separate literatures on unionization. One large literature examines the impact of unionization on pay as well as other outcomes. Unions are well understood to reduce the variance of pay along with, perhaps, increasing its mean.

Blanchflower and Bryson (2004) summarize evidence to this effect, showing both that unions raise pay by about ten percent and that “unions raise wages most for the least educated, with the

most highly educated having the lowest premium.”⁴ If employees are seeking unionization in order to redistribute pay from higher to lower-paid workers, we would expect higher support for unionization among low-paid workers and greater opposition among those with higher pay.

A specific strand of the literature examines the impact of unions on pay at universities (see Hedrick et al, 2011, for a recent contribution). Other papers examine impacts of unionization on research productivity (Hosios and Siow, 2004) or faculty input into decision making (Porter, 2013). The findings of this literature include that unions have small positive impacts on average pay at universities (Hedrick et al, 2011), although unions may redistribute pay among employees (Hedrick et al, 2011; Hosios and Siow, 2004). In addition, unions promote faculty input into decision making but may reduce research productivity (Hosios and Siow, 2004; Porter, 2013).

A second substantial literature explores the determinants of worker support for the unionization of their workplaces. This second literature is of course related to the first in that employee support for unionization might depend, at least in part, on the anticipated effects of unionization. The work tends to link workers’ self-reported tendencies to support unionization to five kinds of factors: one’s current pay, or pay relative to other workers at the firm; dissatisfaction with current working conditions; attitudes toward unionization; belief that a union can materially improve working conditions; and political attitudes.⁵

⁴ They conclude that “the wage benefits of [public sector] union membership are greatest for manual workers, the young and the least educated.” Card, Lemieux, and Riddell (2004) similarly confirm Freeman’s (1980) finding that unions reduce wage inequality.

⁵ Contributions in the economic, industrial relations, and psychology literatures, respectively, include Farber and Saks (1980), Kochan (1979), and Premack and Hunter’s (1988) meta-analysis. Wheeler and McClendon (1991) provides a useful summary of the early literature.

Many of the existing studies of employees' preferences for unionization include a measure of pay, such as the worker's wage relative to other workers at the firm. Numerous studies – such as Farber and Saks (1980), Demsetz (1993), Premack and Hunter (1988), Dworkin and Lee (1985), and Goeddeke and Kammeyer-Mueller (2010) – find that lower-paid workers are more likely to support unionization. Other studies - such as Wheeler, McLendon, and Weikle (1998), Holsinger (2008), and Charwood (2002) – find no relationship between pay and preference for unionization.

Much of the literature emphasizes the role of attitudes toward unions as well as political attitudes more generally. For example, Park, McHugh, and Bodah (2006) find that general beliefs (e.g. attitudes toward unionization) play a large role in preferences for unionization among a sample of pharmacists. Eaton et al (2014), in a study documenting the role of emotion in a union election at Delta Airlines, also find a strong impact of workers' general attitudes toward unions.

Because individual voting choices are secret, the literature on preferences for unionizing of one's workplace relies on surveys.⁶ Surveys have the advantage of being able to elicit measures of attitudes and beliefs, which are the focus of much of the psychological and industrial relations literatures, along with self-reports of objective factors such as pay. Surveys also have the disadvantage of being costly to undertake. As a result, most studies rely on fairly small samples of employees at each workplace. For example, Farber and Saks (1980) employ a

⁶ A related literature uses individual-level data such as the CPS containing demographic information as well as whether one is a union member, exploring the determinants of union membership. See Hundley (1988), Haberfeld (1995), and Charwood (2002), for example.

sample of 829 workers at 29 different workplaces. Wheeler, McLendon, and Weikle (1998) have a relatively large sample of 1,196 at six different workplaces.

Our sample is based on a combination of administrative data on pay, job titles, and academic department, quasi-administrative data on political contributions, scholarly productivity, and teaching success, and open expressions of support or opposition to unionization. Our samples are large, over 3,000 at one university and nearly 2,000 at the other. We have direct measures of pay and productivity, so we can explore the relationship of these factors to unionization preferences.

Our data contain no direct measures of worker dissatisfaction of the sort emphasized since Kochan (1979). Along with pay, we do have three measures of on-the-job performance – number of publications, citations to one’s work, and teaching ratings. To the extent that poor performance leads to dissatisfaction, one might view these as measures of job satisfaction. More generally, we can view these as measures of whether employees are successful at their jobs. It is of interest to know whether those who are proficient at their jobs are more or less supportive of unionization.

While we lack direct measures of employee attitudes, we do have three pieces of information that are indirectly related to attitudes toward unionization. First, we have the employees’ political contributions, by party. Given that Democrats have traditionally been more sympathetic than Republicans to unions, employees’ contributions may serve as a proxy for attitudes toward unionization (see Charwood, 2002). Second, we have information on gender, which some existing studies have identified as a source of different views of unionization.

Finally, and perhaps most important, we have the employees' scholarly fields. Previous research documents relationships between fields and political attitudes, so we can employ the academic department variable as a measure of general attitude toward unionization. Zipp and Fenwick (2006) document the shares of faculty by broad field identifying themselves on a five point scale between very liberal and very conservative. Surveying faculty in both 1989 and 1997, they find that humanities faculty are the most likely to report being politically liberal, while engineering and business faculty are least likely. To the extent that openly expressed attitudes toward unionization relate to scholarly discipline – and moreover, to the extent that those in more liberal fields are more likely to support unionization – we would take this as evidence of an effect of general political attitudes on unionization.

Thus we use this new and rich dataset to revisit the following questions identified in the existing literature. First, among those at the university, how does one's pay affect one's preference for unionization? Second, how does one's proficiency at work affect one's preference for unionization? Third, how do preferences for unionization vary according to one's field-based political leanings? Finally, what is the relative importance of these various factors in determining preferences for unionization?

2. Context at Washington and Minnesota

a. Minnesota

The University of Minnesota system operates five campuses, two of which (Duluth and Crookston) are unionized.⁷ The Twin Cities campus is the University of Minnesota flagship

⁷ <http://www.mprnews.org/story/2016/01/20/uofm-faculty-union-petition>

campus and the only major research university in the state. In 2014, the Center for Measuring University Performance ranked the University of Minnesota 16th among US research universities and 6th among US public universities.⁸ The 2015 unionization drive is not the first at the University. Union supporters attempted unsuccessfully to organize the Twin Cities campus in the late 1990s, when the University’s regents entertained eliminating tenure.⁹

The Service Employees International Union (SEIU) began organizing at the University of Minnesota in 2014.¹⁰ Minnesota law requires that the bargaining cannot include just the adjunct faculty but rather must include the tenured and tenure track faculty as well. The latter faculty “already receive the kind of pay and benefits that adjuncts are demanding,” making it potentially more difficult for the union to prevail in an election.¹¹

Union organizers argue that “a union would give them more input on the direction of the university” and would “give raises to contingent faculty.” One lecturer who “teaches three classes a semester” argued that she does “pretty much everything that a tenure line faculty does” but is “paid less and there's not the ability for recognition and pay increases.”¹² University representatives have stated a preference to “work directly with our faculty, rather than through a third-party union.”¹³

Not all departments at Minnesota are included in the bargaining unit. In particular, the faculties of the Law School and the Academic Health Center (including the schools of medicine,

⁸ <http://mup.asu.edu/MUP-TARU-Natl-1-25.html>

⁹ <http://www.tcdailyplanet.net/seius-faculty-union-effort-may-face-hurdles-university-minnesota/>

¹⁰ <http://www.startribune.com/union-tries-to-woo-faculty-at-university-of-minnesota/279220392/>

¹¹ <http://www.startribune.com/union-tries-to-woo-faculty-at-university-of-minnesota/279220392/>

¹² <http://www.mprnews.org/story/2016/01/20/uofm-faculty-union-petition>

¹³ Email from Patti Dion, Senior Director, Employee Relations at the University of Minnesota, to U of M faculty,. February 12, 2016.

dentistry, nursing, pharmacy, public health, and veterinary medicine) are not currently eligible to vote on unionization.

On January 20, 2016 SEIU “filed cards” with the Minnesota Bureau of Mediation Services (BMS) “to seek an election for the Twin Cities faculty to decide if SEIU will be their exclusive bargaining representative.”¹⁴ That is, the SEIU submitted signed cards from a group of faculty whom SEIU hopes will constitute 30 percent of the voters that the BMS deems eligible. At this writing, the union and the university await BMS decisions on which job titles are eligible to vote as well as whether the union has submitted enough signed cards.

The union and the University disagree on whether non-tenure track faculty are allowed to vote. Minnesota law indicates that the “bargaining unit definition includes the rank of professor, associate professor, assistant professor, research associate or instructor, and research fellow.” Although the union uses the language ‘contingent faculty,’ according to the University, this “is not an employee group or job classification at the University, and it is not a term used in state statute.” After a February 16, 2016 BMS hearing, the University reported that the union “does not agree with the voter eligibility list” provided by the University. Instead, the “union contends that in addition to the positions stated in the statute, this election should also include a number of additional positions, including primarily teaching specialists, senior teaching specialists, lecturer, and senior lecturer.”¹⁵

Pro-union employees have prepared a website making their case for a union. As of February 13, 2016, 234 faculty had signed their names to an open letter supporting for the

¹⁴ Email from Patti Dion, Senior Director, Employee Relations at the University of Minnesota, to U of M faculty, January 25, 2016.

¹⁵ Email from Patti Dion, Senior Director, Employee Relations at the University of Minnesota, to U of M faculty, February 18, 2016.

unionization effort.¹⁶ Of the 234, 172 held titles containing the word “professor.” The others were instructors, lecturers, and teaching specialists who are seemingly outside the group that the University claims is eligible to vote.

b. Washington

The University of Washington at Seattle is a major research university, ranked 11th in the US among research universities. The University of Washington operates three campuses, at Bothell and Tacoma, in addition to the flagship Seattle campus.

The SEIU began organizing the UW faculty in 2015.¹⁷ Like Minnesota, Washington requires a single union for all faculty at the UW system. “State law requires that all faculty be represented by a single union. If the effort is successful, about 5,500 to 6,000 faculty members — from part-time lecturers to tenured professors — at all three campuses (Seattle, Bothell, Tacoma) would belong to one union.”¹⁸

At Washington, groups of faculty favoring, and others opposing, unionization have established respective websites outlining their positions. As of February 13, 2016, the pro-union faculty open letter included 327 signatures.¹⁹ Of these, 191 held titles containing the word “professor.” The faculty opposing unionization have a website, and their open letter includes 837 signatures at this writing.²⁰ Hence, we have public statements of support for unionization for roughly five percent of UW faculty as well as public pronouncements of opposition from

¹⁶ See <http://mnacademics.org/dearcolleagues>.

¹⁷ <http://www.seattletimes.com/seattle-news/education/debate-over-unionizing-uw-faculty-hot-and-heavy/>

¹⁸ <http://www.seattletimes.com/seattle-news/education/debate-over-unionizing-uw-faculty-hot-and-heavy/>

¹⁹ See http://www.uwfacultyforward.org/sign_public_letter_from_uw_faculty.

²⁰ See <http://www.uwexcellence.org/statement-of-opposition.html>.

over ten percent. At Minnesota we have public statements of support from more than five percent of eligible faculty.

II. Data

We have datasets covering the faculties of the Universities of Minnesota and Washington as of January 2016. Subject to caveats described below, for each faculty member we observe salary, whether the faculty is openly opposed to unionization at Washington²¹, whether the faculty member is openly supportive of unionization²², job title (professor, associate professor, lecturer, etc), department (English, economics, etc.). For subsets of faculty we observe a teaching rating (from ratemyprofessor.com), Google Scholar citations, and the faculty member's number of publications at ISI, and political contributions from the Federal Elections Commission website. That we observe some variables only for subsets creates an issue of missing values. The University of Minnesota dataset is very similar, except that we only observe a list of faculty openly supporting unionization. This section discusses details of dataset construction.

1. Minnesota

Assembling a master list of faculty eligible to vote, along with their titles and academic department affiliations, is a non-trivial task. According to summary data provided by the administration's website, the University of Minnesota had 3,804 Twin Cities faculty in 2015, including Medical School, Duluth Medical School, and Duluth Pharmacy.²³ Moreover, the

²¹ Name listed at <http://www.uwexcellence.org/statement-of-opposition.html>.

²² Name listed at http://www.uwfacultyforward.org/sign_public_letter_from_uw_faculty.

²³ See

http://www.oir.umn.edu/hr/employee_count/report?filter%5B%5D=1&filtered_values%5B1%5D=2015&pivot%5B%5D=2&rows%5B%5D=16&rows%5B%5D=3&show_dimensions=0

University of Minnesota follows the IPEDS definition of faculty, including persons who “hold academic rank titles of professor, associate professor, assistant professor, instructor, lecturer or the equivalent of any of those academic ranks.”²⁴

To create an individual-level dataset, we begin with the salary data, which contain pay and job titles but not academic departments. These data are drawn from a public disclosure of salary data posted at a local newspaper site (the Pioneer Press).²⁵ We obtain all 2014 salaries (the most recent year for which data are available) for the University of Minnesota Twin Cities campus. Of these, we retain a superset of employees whose titles contain the words, “professor,” “lecturer,” instructor,” “research,” or “teaching.” This includes 5,055 individuals with positive salaries. I aggregate the titles into six categories: professor, associate professor, assistant professor, lecturer, instructor, and other.

To get department affiliations we do two things. First, we obtain data on department affiliation from the University of Minnesota online department directory.²⁶ The department directories listings as of February 2016 include 4,491 distinct names under the headings of “faculty/staff.” While this number of individuals exceeds the number of faculty, two comments are in order. First, some of the listed faculty/staff are not actually current faculty. For example, the directories include emeritus faculty. Second, some of the faculty in the salary data are missing from the departmental directories. Accordingly, we searched the individual online directory for these faculty by first and last name to obtain department affiliations. In the end, we

²⁴ <https://nces.ed.gov/ipeds/glossary/index.asp?searchtype=term&keyword=faculty&Search=Search>

²⁵ See <http://extra.twincities.com/car/salaries/> .

²⁶ <http://www1.umn.edu/systemwide/directories/>

obtain department affiliations for 3,664 faculty appearing in the salary data, of whom 3,348 have non-zero salaries.

Because the unionization drive at Minnesota excludes the Academic Health Center and the Law School, we exclude individuals in those units. This brings the relevant number of directory listings down to 1,835 in the sample with positive salaries and department affiliations. Of these 1,835, we match open union support data for 155 openly pro-union faculty using a matching key consisting of the last name and the first three letters of the first. We obtain Google citation data for 431, ISI publication data for 1,085²⁷, ratemyprofessor data for 856, and FEC election contribution data for 150.

A query to the ISI dataset for the publications of faculty of a particular university returns a publications from the faculty only while they are employed at that university. Hence, the number of publications is incomplete for faculty members who move mid-career. To deal with this, I separately obtain the annual number of publications, 2006-2015, I then calculate the average number of annual publications, beginning with the first year since 2006 in which the faculty member has publications. This annual average is my measure of ISI publications.

Table 1a shows sample statistics for the University of Minnesota faculty in the sample, both overall and broken down by those expressing pro-union sentiments and those who do not sign an open letter. Supporters have lower salaries, are less productive at research, and are more likely to be female. Their average teaching ratings are about the same as those not expressing support for the union.

²⁷ Note that ISI provides only a first initial, so the matching key for ISI data is the last name plus the first letter of the first name.

2. Washington

The master list of University of Washington employees is from the Washington state salary database.²⁸ We obtain all of the 91,105 employees of the University of Washington system. Most of these are not faculty. Prior to matching we retain 7,439 employees whose job titles include the words “professor,” “instructor,” or “lecturer.” This overstates the number of instructional faculty reported by the university as 4,351, which appears to be the faculty of only UW-Seattle, whereas the University of Washington salary data cover Tacoma and Bothell campuses as well.²⁹ While this database includes job title, it does not indicate academic department.

Because of the possible attitudinal link between academic field and union support, it is important to determine each faculty member’s department. For this, we used the UW online directory, making one query for each department. These queries return both faculty and staff, a superset including 15,934 entries. Of these, 5,618 have titles containing the words “professor,” “lecturer,” “head,” “chair,” “dean,” or “instructor” and therefore are faculty. We also eliminate those whose titles include the words “emeritus,” “retired,” or “visiting.” This leaves us with a master sample of faculty members with positive salaries for 2014, as well as departmental affiliations, consisting of 3,525 observations. I classify the individuals in the sample into nine job titles: professor, associate professor, assistant professor, clinical professor, affiliate professor, professor without tenure, associate professor without tenure, acting professor, and lecturer.

The list of faculty publicly opposing unionization includes 837 names. Of these, 483 match with the data including both salary and departments using a matching key made of the

²⁸ See <http://fiscal.wa.gov/salaries.aspx>.

²⁹ See <https://admit.washington.edu/QuickFacts#faculty>.

upper case last name and the first three letters of the first name. Some of the non-matching faculty are emeritus faculty who no longer appear in the salary database. The list of UW union supporters includes 327 names. Of these, 196 match with data including both salary and department designations.

The FEC data include 4,733 campaign contributions made by University of Washington employees over the period 1997-2015. The FEC classifies contributions as partisan (and if partisan, which party) as well as non-partisan (as with contributions to PACs supporting non-partisan causes). We aggregate giving for each of 1,317 University of Washington employees up to total contributions to Democratic, Republican, and non-partisan recipients. We have 309 aggregated contributions in the matched data.

The teaching rating data include all faculty at ratemyprofessor.com associated with the University of Washington. This list includes 3,174 names, of which 2,847 have at least one rating. Many of these are graduate student instructors, rather than faculty. Of the listed instructors, 849 match with the UW employee data including departmental designations using a matching key consisting of the last name and the first three letters of the first. Google Scholar has 1,531 scholars who registered with Google indicating that they are associated with the University of Washington. Of these, 496 match with the UW employee/department data using the same matching key described above. Many of the remainder are graduate students and others who should not match with the employee data. I am able to match 2,028 faculty with the ISI annual publication data.

Using first names of employees, we can impute gender using data on the distributions of first name frequencies by gender.³⁰ We deem a name female if the name is more common among females than males.

Table 1b presents average values of the variables in the UW data. The first column describes the entire UW dataset, and the remaining columns divide the data into those who oppose the unionization effort, those expressing no preference, and those supporting unionization. The vast majority of the individuals in the sample are at the Seattle campus. Average salaries are higher among opposers. Opposers are, on average, more research productive and less likely to be female. Teaching ratings are, on average, higher among union supporters. Partisan political contributions are overwhelmingly made to Democrats regardless of union attitudes. Contributions are larger among the higher-salaried opposers than among the others. Table 2 presents correlations among variables.

III. Results

Our goal below is to document how attitudes toward current unionization efforts – as implied by open expressions of support or opposition – are related to both individual characteristics such as pay and research and teaching productivity, as well as factors potentially related to more general attitudes: political contributions, scholarly field, and gender. It is worth reflecting on the goal of the exercise. One sort of question is whether, say, higher salary causes more or less support for unionization. To get credibly at that sort of causal inference, we would require a source of exogenous variation in pay. A second sort of question, more descriptive than

³⁰ See <http://deron.meranda.us/data/census-dist-female-first.txt> and <http://deron.meranda.us/data/census-dist-male-first.txt>.

causal, is the question, how do preferences for unionization vary among faculty with different characteristics? Are higher or lower-paid faculty more likely to oppose the union? And, related, conditional on other characteristics, are higher- or lower-paid faculty more likely to support? Or conditional on salary, department, and job title, are more research-productive scholars (or more popular teachers) more or less likely to support unionization? The second sort of question is what we address here. We begin with bivariate descriptive approaches and then turn to multivariate analyses.

1. Simple Descriptive Analyses

Before turning to multivariate analyses of union opposition, it is useful to present bivariate analyses. We begin with the relationship between salary and union opposition. Figure 1 shows the distribution of salary for each school, along with measures of union preference, using locally weighted regression, with higher weights for nearer observations (the “lowess” command using the mean option in Stata). At each school, open support for the union initially rises in salary, reaching a peak around 10 percent at a salary of about \$70,000, then declines. Open opposition to the union rises steadily in salary at Washington, reaching over 25 percent at salaries above \$200,000.

Figure 2 examines the relationship between Google Scholar citations and union support for the faculty with linked Google Scholar data. For the University of Washington, opposition rises in citations, and support falls. At Minnesota, the relationship is less clear: the support rate is around 5 percent up to 8 log citations, then it declines. It’s worth noting, however, that there

are only 24 union supporters among the 431 University of Minnesota sample members with Google Scholar data.

Figure 3 examines the relationship between a different measure of scholarly productivity, the annual number of ISI publications, and union support. Among University of Washington faculty, opposition rises fairly steadily in publications, and support falls. The pattern at Minnesota is very similar. Union support is around 10 percent for faculty with 1 publication (e^0) and falls toward zero as the publication rate rises.

Figure 4 examines the relationship between teaching ratings and union support for the matched set. At Minnesota, union support rises with teaching ratings up to 4, when union support tops 12 percent. Union support falls to 8 percent for ratings between 4 and 5. The support pattern is very similar at Washington. Opposition to the union among Washington faculty falls monotonically in teaching ratings. Over a fifth of teachers rated below 2.5 oppose unionization, while under 15 percent of teachers rated over 4 oppose unionization.

Figure 5 shows attitudes toward unionization by gender at the two schools. At both schools, female faculty are more likely to support unionization. At Washington, male faculty are more likely to oppose unionization.

Table 3 provides some evidence on how openly voiced views about unionization vary by academic department. The ten departments at Minnesota with the highest shares of faculty openly supporting unionization are primarily in the humanities and social sciences. They are Cultural Studies and Comparative Literature, History, Asian Languages and Literature, Spanish and Portuguese, Theater Arts and Dance, Anthropology, Field Wildlife and Conservation Biology, Social Work, Art, and Music whose support rates range from 44 to 19 percent.

As at Minnesota, the Washington departments with highest support for unionization are predominantly in the humanities and social sciences. The top ten are History, English, Communications, Social Work, Sociology, Political Science, Asian Languages and Literature, Mathematics, Mechanical Engineering, and Urban Design and Planning. Support drops quickly across these departments, from 36 and 21 percent, respectively, in History and English, to under 10 percent at Mathematics, Mechanical Engineering, and Urban Design and Planning. The Washington departments with highest shares of faculty openly opposing unionization are Obstetrics and Gynecology, Bioengineering, Computer Science and Engineering, Chemistry, Accounting, Electrical Engineering, Physics, Mechanical Engineering, Economics, and Genome Sciences.

While the bivariate relationships are intriguing, they are also potentially misleading because of correlations among variables. Table 2 reports correlations among variables in the two samples, and many variables – such as publications and citations - are highly correlated. Beyond that, attitudes toward unionization vary by salary and by department. Salary also varies by department, and bivariate analyses cannot by themselves indicate whether the departmental variation in union support simply reflects salary differences. To address this we turn now to multivariate analyses that simultaneously control for different variables.

2. Regression models of open support and opposition

a. Washington

For Washington faculty we observe open expressions of union opposition and support from about a quarter of the faculty, which we can use in the following way. Suppose each faculty member has some underlying level of support intensity y^* . If $y^* > 0$, the employee

supports the union, while if $y^* \leq 0$, the employee opposes unionization. Not all employees express their preferences, because doing so is costly. Expressing open opposition has some unobservable cost c_s , while expression open opposition has an unobservable cost c_o .

With this setup we observe an expression of support if (and only if) $y^* > c_s$, and we observe an expression of opposition if (and only if) $y^* < c_o$. If the employee's intensity of support lies in $[c_o, c_s]$, then we observe no openly expressed preference. Even though we do not observe y^* , we can estimate a model of its determinants based on the three observable outcomes: open support, open opposition, and no expression. In particular, we can estimate this using an ordered model such as ordered probit.

That is, we posit the model $y_i^* = X_i\beta + \varepsilon_i$, where y_i^* is individual i 's unobserved level of support for unionization, X_i is individual i 's characteristics (salary, etc), and ε_i is a normal error.

The likelihood function has three branches:

$$\Pr(i \text{ expresses support}) = \Pr(y_i^* > c_s) = \Pr(X_i\beta + \varepsilon_i > c_s) = \Pr(\varepsilon_i > c_s - X_i\beta) = 1 - \Phi(c_s - X_i\beta)$$

$$\Pr(i \text{ expresses opposition}) = \Pr(y_i^* < c_o) = \Pr(X_i\beta + \varepsilon_i < c_o) = \Pr(\varepsilon_i < c_o - X_i\beta) = \Phi(c_o - X_i\beta)$$

$$\Pr(i \text{ remains silent}) = \Pr(c_s \geq y_i^* \geq c_o) = \Pr(c_s \geq X_i\beta + \varepsilon_i \geq c_o) = \Pr(c_s - X_i\beta \geq \varepsilon_i \geq c_o - X_i\beta) = \Phi(c_s - X_i\beta) - \Phi(c_o - X_i\beta), \text{ where } \Phi \text{ is the standard normal cdf.}$$

The variables included in X merit some discussion. We have salary, job titles, and department affiliations for all observations. We have political contributions, publications, citations, and teaching ratings only for a subset. With political contributions, the absence of a match means in principle means that the individual has made no political contributions that require FEC reporting.

The absence of a match with the Google citation, ISI publication, and teaching ratings data has a different meaning. Scholars must register with Google Scholar in order to appear in a particular university's list. Scholars not listed under "University of Washington" have citations on Google Scholar, but their totals are not calculated. Similarly, not all University of Washington teaching faculty have entries at ratemyprofessor.com. Matches with ISI are imperfect because ISI includes only first initials and not entire first names.

The number of observations with no missing values on any variables is small, and including all variables in the models directly is not feasible, so we proceed using three different approaches. First, after including the always-available salary and gender variables, we include the others one at a time. Second, we use indicator variables for the missing observations, along with the underlying variables where the missing values are replaced with zeroes. Third, we employ multiple imputation approaches for the missing values (White, Royston, and Wood, 2011).

Table 4 reports ordered probit models on open union support at the University of Washington using one of the often-missing variables at a time. Each of the models also includes department and title fixed effects, and salary and gender are included in all specifications. The various columns include log Google Scholar citations, the log ISI publication rate, the ratemyprofessor rating, and log political contributions, respectively. Included individually along with salary and gender, the log ISI publication variable and the Google Scholar citation variables are each significant, while the others are not. After accounting for department, title, and gender, faculty with higher salaries – and faculty with greater research productivity – are less supportive of unionization.

Table 5 reports specifications with dummies for the missing values. For each of the four often-missing variables x_k , Google Scholar citations, ISI publications, ratemyprofessor rating, and campaign contributions, we include two variables in the models. First, we create dummy that takes the value of 1 if the variable is missing (δ_k). Second, we create a variable which takes the value of 0 when it is missing and the value of the continuous variable x_k when it is not missing. Thus, for example, we include a dummy variable for whether an individual lacks ISI publications along with another variable that is the log of ISI publications for observations where they are available and zero for the other observations. Using this approach, again including department and title fixed effects, we see negative and significant relationships between both research productivity measures (Google citations and ISI publications) and union support. The other variables – gender, teaching rating, and contributions – are statistically insignificant.

To measure the role of political attitudes, we replace the department dummies with the percent of faculty in that field who designate themselves as liberal or somewhat liberal, derived from Zipp and Fenwick (2006). The political attitude variable, included in the second column of Table 4, is highly significant: support for unionization is more likely from faculty in departments whose members are in fields whose participants are on average more politically liberal. For column (2) standard errors are clustered on the Zipp and Fenwick (2006) department groupings.

Before turning to other methods for dealing with missing values, we can entertain a different model. Thus far we have assumed that the willingness to express a view and the attitude toward unionization are governed by the same index. It is possible that willingness to openly express a view has different determinants. One approach would be to have a two part model of, first, open expression, and second, attitudes toward unionization conditional on open expression. I lack a credible source of identification for the open expression model. Still, the

concern that open expression and attitudes toward unionization are different dimensions bears exploration. In the model above I assume that those who are silent have $c_s \geq y_i^* \geq c_o$. An alternative interpretation of silence is that I have no information about preferences. So a simple robustness check discards the silent individual and simply estimates a probit on union support among only open supporters and open opposers. The last two columns of Table 5 reproduces the exercise of the first two columns including only those expressing an open preference. The pattern of results is similar. Salary and publications are significant (as is log citations in column 4); and the departmental political attitude matters. I conclude that the results are not sensitive to the modelling assumption implicit in the ordered approach.

Table 6 turns to a more sophisticated method for dealing with missing values. We have determined thus far that after accounting for the always-available department and title fixed effects, gender, and salary, only productivity measures matter. Hence, our goal is to impute the missing values of these measures, log Google citations and log ISI publications. The first column reports an ordered probit modelling support for unionization as a function of gender, salary, and department and title fixed effects, as well the log ISI publication measure. Recall that we observe the ISI measure for 2,028 observations among the full sample of 3,526. We impute using predicted mean matching, using the ten nearest neighbors. In addition we perform ten imputations. Column (1) of Table 6 is the imputed value analog of column (2) of Table 4, which reports the same model using only observations where log ISI publications are non-missing. As before, union support declines in salary and research productivity. The coefficients are -0.09 for log salary and -0.07 for log ISI publications, respectively, in the imputed specification, compared with -0.12 and -0.13 using only the observations with non-missing data.

Column (2) of Table 6 imputes Google Scholar citations on the entire sample, a rather aggressive approach given that the variable is missing for over 3,000 of the 3,526 observations. The third column imputes Google Scholar citations just for the subset of observations for which we have ISI publications. Columns (4)-(6) repeat the exercise of columns (1)-(3), removing the department fixed effects and adding the department-level political attitude variable. In each case, as above, faculty with higher salaries and greater research productivity are less supportive of unionization. Faculty from departments with higher levels of political liberalism are more supportive of unionization.

Table 7 turns to effect magnitudes. We first report probability derivatives from a parsimonious ordered probit model (including salary, gender, the ISI publication rate, departmental political attitudes, and title fixed effects) for two of the three outcomes: support for unionization and opposition.³¹ We then report the 90th and 10th percentiles of the distributions of the explanatory variables. Finally, we report the product of the probability derivative and the 90-to-10th percentile difference in the explanatory variable. This is our estimate of the change in predicted probability of support (or opposition) with a movement from the 10th to the 90th percentile of the explanatory variable.

An increase in salary from the 10th to the 90th percentile would decrease support by 3 percentage points and increase opposition by 8 percentage points. A movement from the 10th to the 90th percentile of the ISI annual publication distribution would decrease support by 4 percentage points and increase opposition by 10. A movement from the 10th to the 90th percentile of the political attitude distribution in the direction of greater liberalism would raise

³¹ Note that the probability derivatives for all three outcomes must sum to one, so the probability derivative not shown, for the quiet outcome, is unity less the sum of the reported derivatives.

support by 9 percentage points and decrease opposition by 23 percentage points. Thus, inter-departmental differences in attitude - after accounting for salary and research success - have a bigger impact than either scholarly impact or salary.

b. Minnesota

The Minnesota data contain only open expressions of support for unionization. Hence, we have two groups, those who are silent and those who support. If we view individuals as having an unobserved preference for or against unionization y^* along with some cost of expressing support c_s , we can view those expressing support as revealing an intensity of support in excess of c_s . We can model the determinants of the underlying preference via probits or linear probability models. Table 8 reports these models. Column 1 reports a probit that includes both title and department fixed effects. Column (2) replaces the department fixed effects with the departmental political attitude measure. Probability derivatives are reported in columns (1) and (2). Column (3) and (4) repeat the exercises the first two columns using linear probability models rather than probits.³²

We see two broad results here. First, salary matters. The probability of expressing open support rises in salary, then falls, reaching a peak probability around \$50,000 in salary. Second, department has a large effect; and this effect is correlated with departments' fields political attitudes. Moving salary from the 10th to the 90th percentile of the earnings distribution reduces the probability of support by 8 percentage points. Moving the department-based political attitude measure from the 10th to the 90th percentile (toward liberal) raises the probability of open support

³² The probit model in column (1) includes fewer observations because the observations in which the department fixed effects perfectly predicts union support are dropped.

by 14 percentage points. Hence, at Minnesota as at Washington, the size of the effect associated with the department's average political attitude is large in relation to the other effects.

Because opposition tends to occur for employees with research output – and we do not observe opposition among MN faculty – we don't see evidence of the relationship between research and union preference at MN.

Conclusion

Using a relatively large new dataset comprised of both open expressions of support and opposition to unionization, along with administrative and quasi-administrative data on pay, productivity, and indirect measures of political attitudes, we provide new evidence on the determinants of preferences for unionization among university faculty. We find a clear negative relationship between salary and support for unionization. We also find that faculty who produce more – and more highly cited – research are less likely to support unionization. After accounting for salary, department, and title, gender and contributions do not matter. Finally, we see large impacts of academic department on union support; and these differences are correlated with field political attitudes. After accounting for their pay and research productivity, faculty in fields whose members tend to be more politically liberal are far more likely to support unionization.

Our findings have relevance to the literature as well as some practical contemporary issues. First, while the literature finds mixed effects of salary we find clear negative effects of salary on preference to unionization, both directly and after accounting for a host of other factors. Second, while individual factors related to pay and research are important, we also find a large role for attitudinal factors, as reflected in the role of the scholarly field. Third, our results

have clear implications for the relationship between the composition of the electorate and its tendency to support unionization. At a research university, including non-tenure track faculty, who have lower salaries and less research output than tenure track faculty, will deliver an electorate more favorably disposed toward unionization.

Finally, our results have implications for possible impacts of unionization on universities' pursuit of their research mission. More productive researchers are less supportive of unionizing their universities. To put this another way, the workplace attribute of having a union is one that our results indicate is less appealing to more research-productive scholars. This raises the possibility that universities that unionize will face difficulty attracting and retaining the most productive scholars.

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Table 1: Summary Statistics

a. University of Minnesota

	all		silent		supportive	
	N	mean	N	mean	N	mean
Salary	1,835	102,909	1,680	104,051	155	90,535
female	1,835	0.32	1,680	0.32	155	0.39
Google citations	431	4809.84	407	4943.36	24	2545.58
ratemyprofessor rating	856	3.55	767	3.55	89	3.58
ISI publications	1,085	3.96	1,007	4.09	78	2.26
contributions to Dems	119	2,202	106	2,146	13	2,654
contributions to Reps	6	1,433	6	1,433	0	
non-partisan contribs	25	631	20	659	5	520

b. University of Washington

	all		opposed		silent		supportive	
	N	mean	N	mean	N	mean	N	mean
salary	3,526	101,261	483	143,522	2,847	95,467	196	81,266
female	3,526	0.33	483	0.27	2,847	0.33	196	0.43
Google Scholar Citations	496	5,267	160	7,328	312	4,518	24	1330
Ratemyprofessor rating	850	3.71	163	3.67	604	3.70	83	3.88
ISI publications	2,028	3.79	364	4.59	1,575	3.72	89	1.79
contributions to Dems	212	3,116	45	4,627	157	2,765	10	1825
contributions to Reps	10	1,885	4	1,238	6	2,317	0	
non-partisan contributions	87	2,122	20	3,630	64	1,687	3	1333
Bothell	3,526	0.08						
Seattle	3,526	0.86						
Tacoma	3,526	0.07						

c. University of Washington Union Support by Campus

campus	Oppose union	Support union
Bothell	2.59%	12.22%
Seattle	15.55%	3.81%
Tacoma	2.94%	20.17%

Table 2: Correlations among Variables

Washington

	oppose	support	female	log salary	log Google	contributions	teaching rating
support	-0.0967*						
female	-0.0507*	0.0527*					
log salary	0.2115*	0.0127	-0.0441*				
log Google	0.2252*	-0.2754*	-0.1161*	0.3533*			
contributions	0.097	-0.0242	-0.0416	0.0283	-0.1244		
teaching rating	-0.0246	0.0595	-0.0237	-0.0294	-0.0151	-0.1183	
log ISI pubs	0.1468*	-0.1088*	-0.1155*	0.2675*	0.3835*	0.0057	-0.0843

Minnesota

	support	female	log salary	log Google	contributions	teaching rating
female	0.0412					
log salary	-0.0405	-0.1530*				
log Google	-0.0295	-0.1208*	0.5158*			
contributions	0.0133	-0.0119	0.0766*	0.0668		
teaching rating	0.0108	-0.0249	-0.1460*	-0.1443*	0.0061	
log ISI pubs	-0.1275*	-0.1192*	0.1931*	0.3274*	-0.0007	-0.0107

Note: * indicates significance at the 5% level in a two-sided test.

Table 3: Unionization Views by Department

A. Minnesota

Minnesota departments most supportive	support
CULTURAL STDY AND COMP LIT	44.44%
HISTORY	35.00%
ASIAN LANGUAGES AND LIT	27.78%
SPANISH AND PORTUGUESE	26.09%
THEATRE ARTS AND DANCE	24.00%
ANTHROPOLOGY	23.53%
FISH WILDLIFE AND CONS BIO	23.53%
SOCIAL WORK, SCHOOL OF	23.08%
ART	19.05%
MUSIC	18.60%

B. Washington

Departments with highest pro-union share	support	Departments with highest anti-union share	opposed
HISTORY	35.71%	OBSTETRICS AND GYNECOLOGY	67.50%
ENGLISH	21.43%	BIOENGINEERING	62.50%
COMMUNICATIONS	17.24%	COMPUTER SCIENCE AND ENGINEERING	58.97%
SOCIAL WORK	16.92%	CHEMISTRY	50.00%
SOCIOLOGY	14.29%	ACCOUNTING	40.00%
POLITICAL SCIENCE	14.29%	ELECTRICAL ENGINEERING	39.53%
ASIAN LANGUAGES AND LITERATURE	11.11%	PHYSICS	29.82%
MATHEMATICS	9.84%	MECHANICAL ENGINEERING	28.13%
MECHANICAL ENGINEERING	6.25%	ECONOMICS	28.00%
URBAN DESIGN AND PLANNING	5.00%	GENOME SCIENCES	26.67%

Table 4: Ordered Probit on Union Support at /UW:
Salary, Gender, and Each other Variable

	citations	publications	teaching rating	contributions
log salary	-0.5147 (0.1603)**	-0.1265 (0.0430)**	-0.1922 (0.0880)*	-0.1276 (0.2153)
female	0.1969 (0.1656)	-0.0565 (0.0746)	0.1631 (0.1060)	-0.0672 (0.2937)
log Google Scholar Citations	-0.2349 (0.0713)**			
log ISI publications		-0.1200 (0.0347)**		
RYP rating			0.0061 (0.0542)	
log contributions				-0.0461 (0.1042)
<i>N</i>	496	2,028	850	248

* $p < 0.05$; ** $p < 0.01$

Note: Dependent variable is ordered with support the highest value, followed by silence, then opposition. All models includes department and title dummies.

Table 5: UW Union Support and Political Attitudes
Dummies for Missing Values

	all	all	exclude silent	exclude silent
log salary	-0.0763 (0.0282)**	-0.0635 (0.0205)**	-0.8261 (0.3351)*	-0.3905 (0.1736)*
Google cites missing	-1.2847 (0.3417)**	-1.1904 (0.6429)	-3.0311 (1.5002)*	-2.3594 (1.2336)
Log G cites	-0.2210 (0.0439)**	-0.2216 (0.0817)**	-0.4609 (0.2035)*	-0.3861 (0.1827)*
ISI pubs missing	-0.0086 (0.0612)	0.0080 (0.0438)	0.2995 (0.2906)	-0.0231 (0.1370)
log ISI pubs	-0.0909 (0.0336)**	-0.1278 (0.0295)**	-0.1815 (0.1556)	-0.3320 (0.1044)**
female	0.0578 (0.0564)	0.0474 (0.1132)	0.3632 (0.2656)	0.2904 (0.1928)
RYP missing	0.1362 (0.2143)	0.3792 (0.1747)*	-0.5940 (0.6724)	0.8587 (0.7286)
RYP rating	0.0080 (0.0543)	0.0396 (0.0467)	-0.1563 (0.1737)	0.1217 (0.1569)
Contribs 0 or missing	0.0920 (0.0995)	0.0885 (0.1252)	0.9820 (0.6181)	-0.0184 (0.3829)
Log contributions	-0.0374 (0.0699)	-0.1397 (0.0770)	-0.5363 (0.4269)	-0.3943 (0.2860)
political attitude		0.0330 (0.0049)**		0.0685 (0.0080)**
<i>N</i>	3,527	3,060	679	589

* $p < 0.05$; ** $p < 0.01$

Note: Dependent variable is ordered with support the highest value, followed by silence, then opposition. Columns (1) and (3) includes department dummies. Column (2) replaces department with the Zipp and Fenwick (2006) share of faculty in the field identifying as “liberal” or “somewhat liberal.” Columns (3) and (4) exclude silent. All columns include title dummies. Standard errors clustered on the Zipp and Fenwick department classifications in columns (2) and (4)

Table 6: Ordered Probit on Union Support UW Union Support

Missing Values Imputed via PMM

	impute ISI var on whole sample	impute Google cites on whole sample	impute Google cites on ISI subsample	impute ISI var on whole sample	impute Google cites on whole sample	impute Google cites on ISI subsample
log salary	-0.0876 (0.0278)**	-0.0880 (0.0283)**	-0.1212 (0.0446)**	-0.0808 (0.0270)**	-0.0880 (0.0273)**	-0.1087 (0.0401)**
log ISI pubs	-0.0771 (0.0338)*			-0.0928 (0.0276)**		
female	0.0759 (0.0558)	0.0823 (0.0560)	-0.0257 (0.0739)	0.0801 (0.0536)	0.0911 (0.0548)	0.0111 (0.0678)
log Google citations		-0.0453 (0.0295)	-0.1210 (0.0417)**		-0.0916 (0.0282)**	-0.1261 (0.0341)**
political attitude				0.0321 (0.0025)**	0.0303 (0.0027)**	0.0300 (0.0035)**
<i>N</i>	3,526	3,526	2,123	3,059	3,059	1,872

* $p < 0.05$; ** $p < 0.01$

Note: Dependent variable is ordered with support the highest value, followed by silence, then opposition. All specifications include department and title FE. Imputation done via predictive mean matching using the 10 nearest neighbors, with 10 imputations. The first and fourth columns impute the log ISI publication variable for the entire sample. The second and fifth columns impute the Google citation variable for the whole sample. The third and sixth columns use the ISI publication variable to help impute the Google citation variable for the ISI subsample.

Table 7: UW Effect Magnitudes (Parsimonious Model)

	support		oppose		10%	90%	Δ prob: 90-10 pctl	
	dProb/dx	se	dProb/dx	se			support	oppose
log salary	-0.009	0.004	0.026	0.010	9	12.2	-0.03	0.08
female	-0.001	0.006	0.004	0.017	0	1	0.00	0.00
log ISI pubs	-0.012	0.003	0.034	0.008	1.1	4.1	-0.04	0.10
political attitudes	0.003	0.000	-0.007	0.001	8.7	40.9	0.09	-0.23

Note: the first four columns show the probability derivatives and their standard errors for the probabilities of support and opposition (based on an ordered probit linking union support to log salary, gender, political attitudes, and log ISI publications). Columns 5 and 6 show the 90th and 10th percentiles of the variable distributions. The last two columns show the change in the probabilities of support and opposition with a movement from the 10th to the 90th percentile in the row variable.

Table 8: U of M Individual Characteristics and Open Union Support
(probit; probability derivatives reported)

	probit	probit	LPM	LPM
log salary	1.0975 (1.4603)	1.1992 (0.3053)**	0.6016 (0.2775)*	0.5828 (0.1883)**
(log salary)^2	-0.0506 (0.0662)	-0.0552 (0.0130)**	-0.0290 (0.0128)*	-0.0274 (0.0092)*
female	0.0013 (0.0128)	0.0043 (0.0220)	0.0019 (0.0153)	0.0041 (0.0301)
missing ISI pubs	-0.0024 (0.0139)	0.0009 (0.0060)	-0.0024 (0.0165)	0.0041 (0.0080)
log ISI publications	-0.0090 (0.0116)	-0.0112 (0.0063)	-0.0084 (0.0089)	-0.0140 (0.0066)
not in Google Scholar	0.0371 (0.0623)	0.0362 (0.0262)	0.0522 (0.0643)	0.0393 (0.0434)
log citations	0.0045 (0.0102)	0.0045 (0.0040)	0.0056 (0.0085)	0.0040 (0.0049)
Contribution=0	0.0646 (0.0726)	0.0594 (0.0236)*	0.1462 (0.1427)	0.1440 (0.0999)
log contributions	0.0221 (0.0259)	0.0193 (0.0094)*	0.0272 (0.0209)	0.0263 (0.0152)
missing rating	-0.0141 (0.0377)	0.0031 (0.0435)	-0.0127 (0.0408)	-0.0061 (0.0512)
RMP rating	-0.0007 (0.0095)	0.0009 (0.0091)	0.0004 (0.0107)	0.0008 (0.0107)
political attitude		0.0044 (0.0004)**		0.0052 (0.0007)**
<i>N</i>	1,441	1,709	1,709	1,709
<i>R</i> ²			0.07	0.07

* $p < 0.05$; ** $p < 0.01$

Note: The dependent variable is 1 for open support for unionization while 0 reflects no expressed opinion. Columns (1) and (2) present probability derivatives from probit models. Columns (3) and (4) present linear probability models. Standard errors in columns (2) and (4) are clustered on Zipp and Fenwick department groups. All models include both title and department fixed effects.

Figure 1: Salary and Views on Unionization

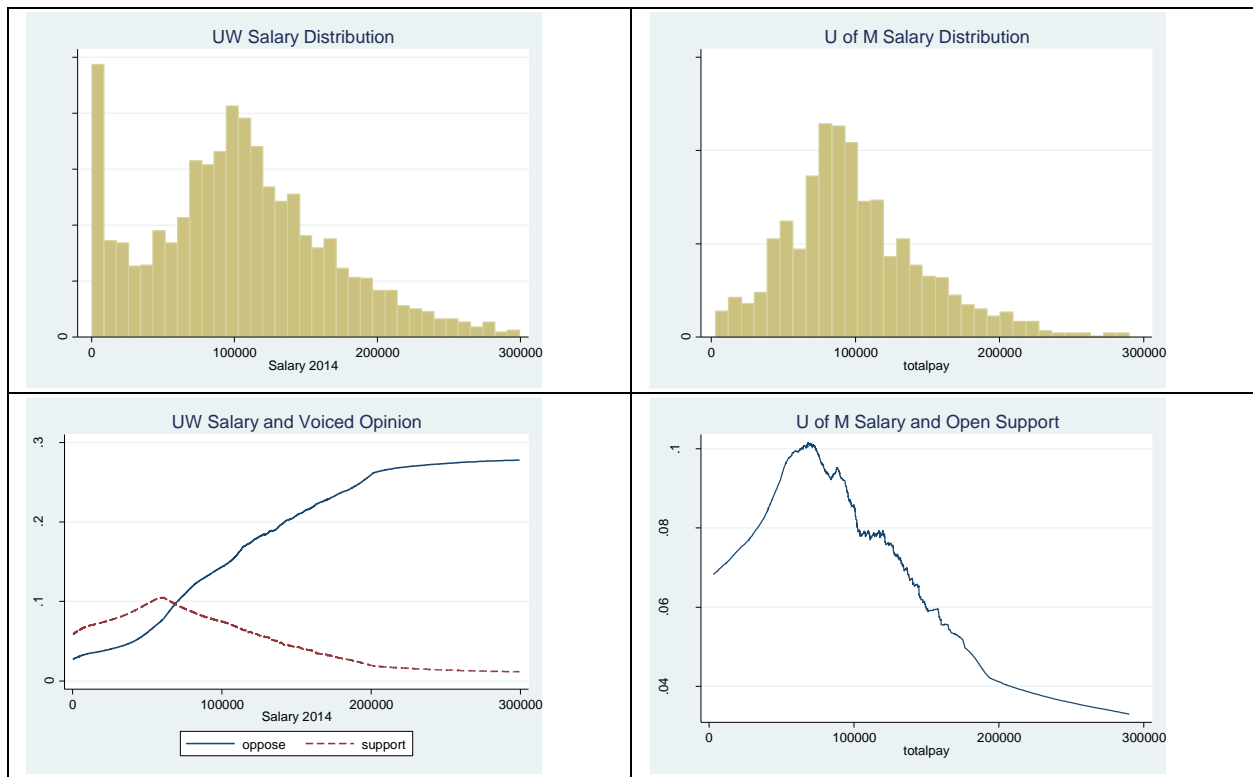


Figure 2: Google Scholar Citations and Views on Unionization

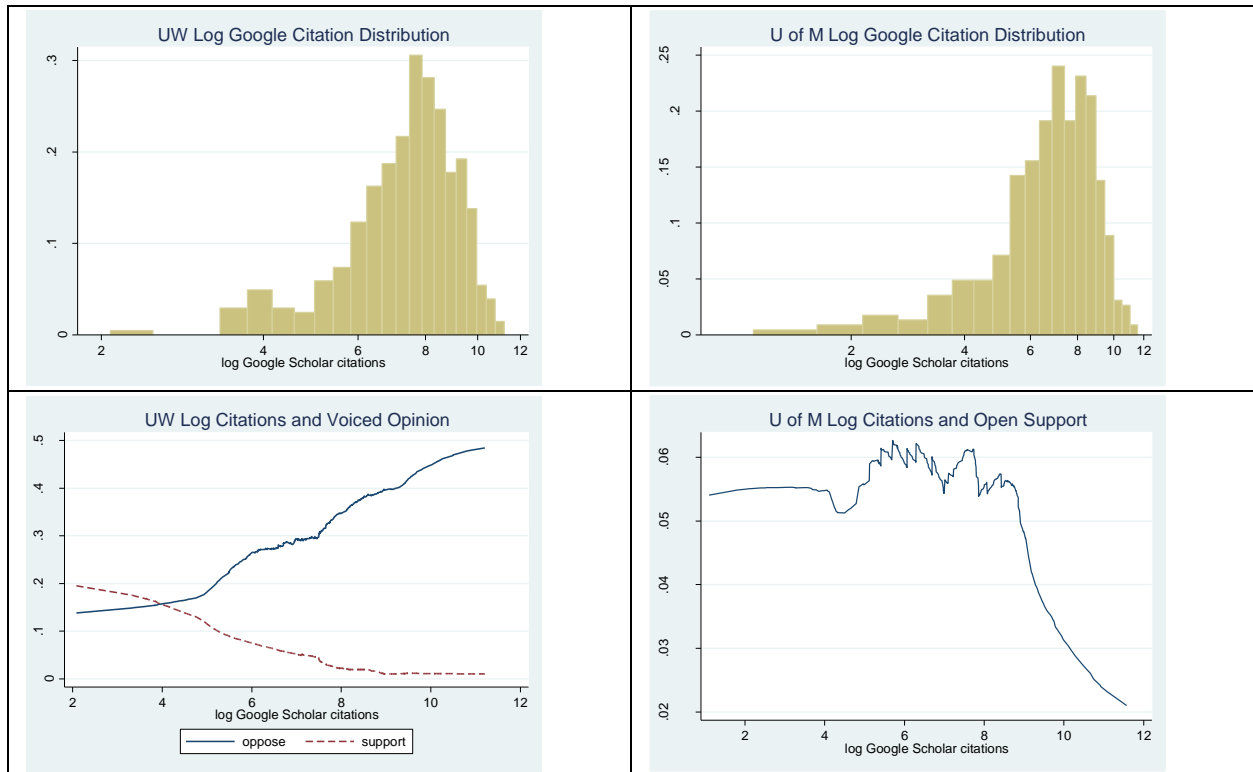


Figure 3: ISI Publications and Views on Unionization

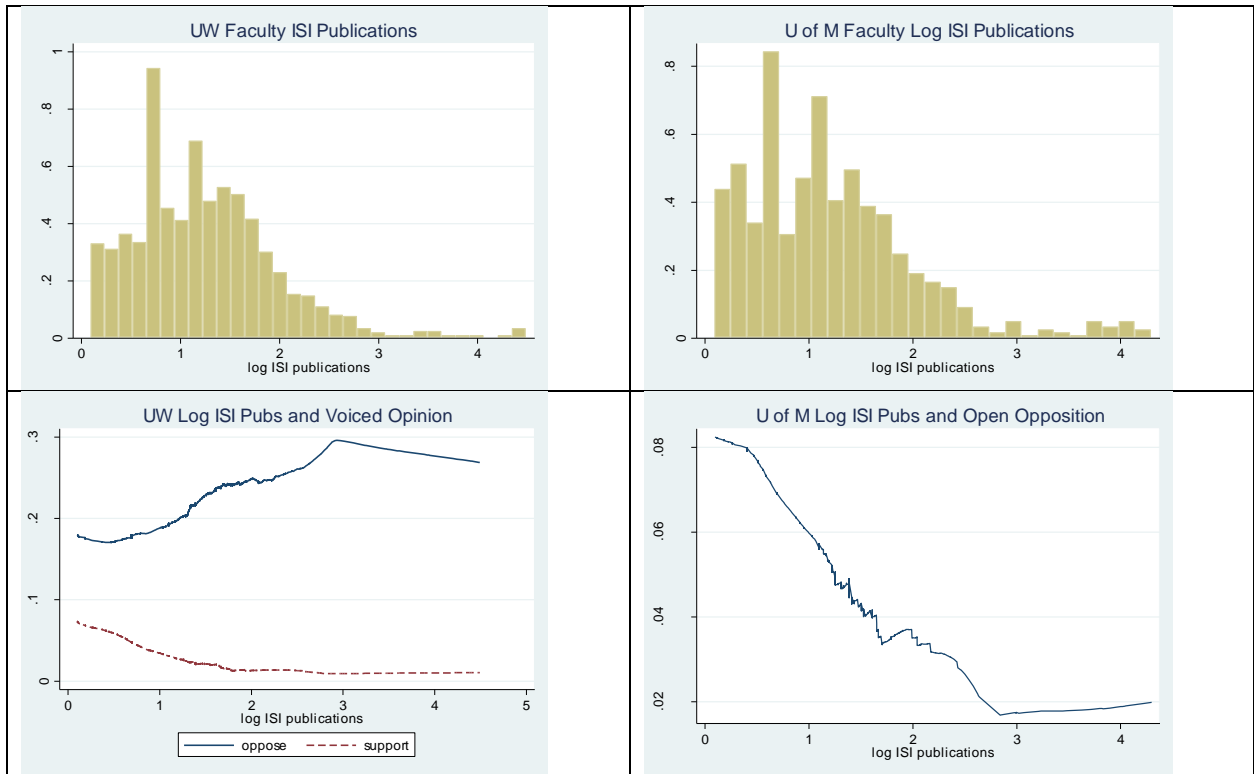
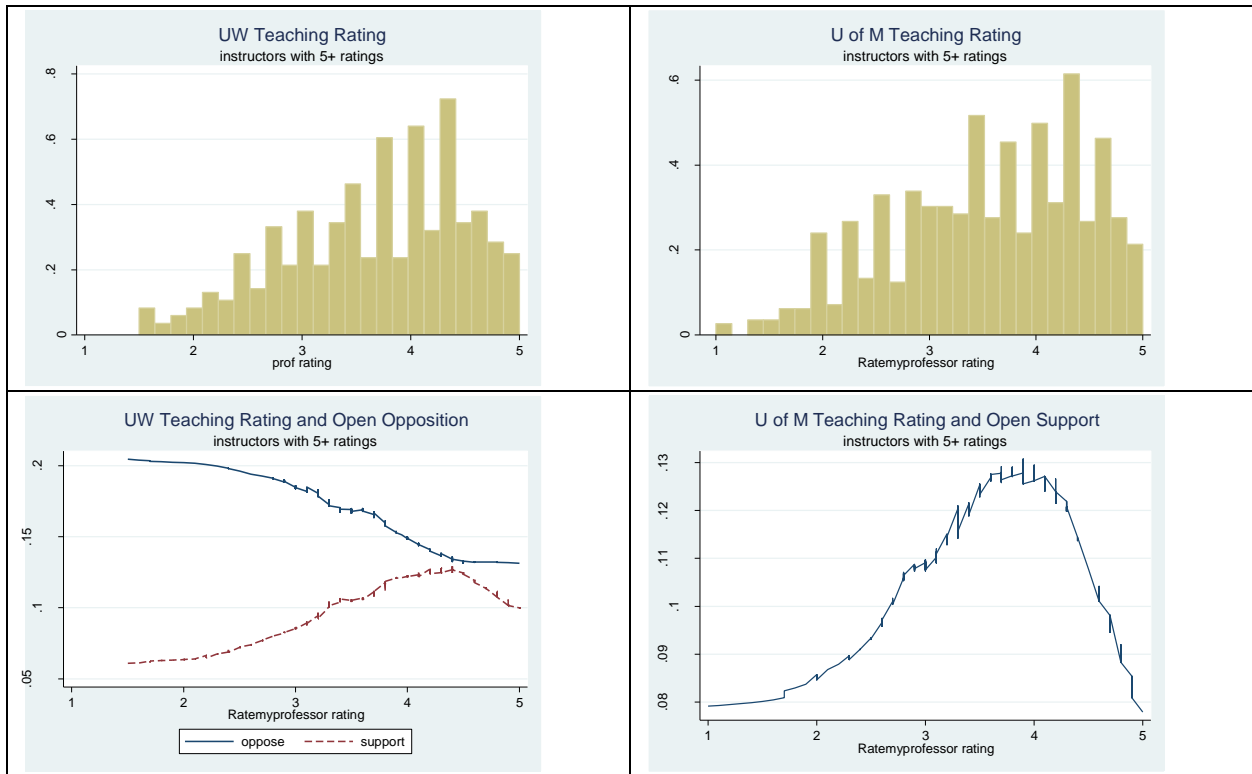


Figure 4: Teaching Ratings and Views of Unionization



Note: teaching ratings from ratemyprofessor.com.

Figure 5: Union Support by Gender

