

Faculty Privilege:

Research and the Rise of Tenure and Faculty Authority in American Higher Education

Scott E. Masten*

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ABSTRACT

Faculty at American colleges and universities possess an exceptional combination of job security and decision authority. Why some faculty should enjoy rights, privileges, and protections available to virtually no other class of employees has never been adequately explained, however. This paper makes three main contributions to the debate over tenure and university governance. First, it identifies a source of “hold-up” peculiar to academic employment. Second, it directs attention to the critical role of faculty authority over personnel decisions in securing the employment protections conventionally associated with academic tenure. Finally, the paper documents the relationship between research and faculty personnel authority over time and across institutions using institution-level publication data from 1900-1940 and 1975-2014. Estimates accounting for unobserved heterogeneity and selection in authority allocations in 1970 show substantial costs of “mistaken organization”: Marginal treatment effect estimates indicate that delegation of authority over personnel decisions to faculty increased research productivity among institutions that chose to do so (a positive “average treatment effect on the treated”), whereas delegating personnel authority to faculty at institutions where administrators had retained that authority would have reduced research productivity (a negative “average treatment effect on the untreated”). Even publication rates and authority remain correlated, the data provide no evidence of selection or causal relationships in the allocation of personnel authority in 2001, however.

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*Professor of Business Economics & Public Policy, Stephen M. Ross School of Business, University of Michigan. Ann Arbor, MI 48109-1234, semasten@umich.edu. I have benefited from the comments of Giorgio Zanarone and participants at the Barcelona School of Economics Summer Forum Workshop on Organizational Economics and seminars at George Mason University Scalia Law School and the University of Michigan. Special thanks to Stephen Porter and Gabriel Kaplan for sharing Kaplan’s 2001 AAUP survey data; to Larry Gerber for sharing electronic versions of his coding of the AAUP surveys reported in his 2014 book; and to Victor Borden, Project Director of the Carnegie Classification of Institutions of Higher Education, for providing an electronic copy of the 1970 classification information from *The Classification of Institutions of Higher Education* (1973). The Web of Science data files used in this study are licensed materials obtained with the assistance of the University of Michigan Library. Dignan Chen provided invaluable programming assistance extracting and organizing data from the Web of Science database.

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1. Introduction

Faculty at American colleges and universities possess an exceptional, arguably unique, combination of job security and decision authority. In addition to the employment protections of academic tenure, “regular” faculty at most higher education institutions exercise significant authority over important organizational policies and decisions, including product design (curriculum) and, perhaps most significantly, personnel matters: appointments, promotions, and dismissals. Although employees in a handful of other settings enjoy comparable job protections — primarily public sector employees such as federal judges, public school teachers, and other civil servants — in none of these do current employees get to choose their colleagues democratically.¹

Critics have long faulted tenure and faculty governance for contributing to all manner of dysfunction and inefficiency in higher education. Perhaps most conspicuous from an economic perspective is tenure’s degradation of incentives. As Brogaard, Engelberg, and Van Wesep recently put it, “the incentives provided by the threat of termination are perhaps the starkest incentives faced by most employees, and tenure removes those incentives” (2018: 179-80). Tenure also impedes progress in instruction and research by hindering the replacement of faculty whose knowledge or specialty has become

¹ Higher education systems in other countries also typically feature some form of academic tenure with varying degrees of faculty authority. The U.S. differs from most other countries, however, in the number of private postsecondary institutions (among other ways). For a recent discussion and empirical analysis of the governance of Italian universities, see Degli Antoni et al. (2021). Law firms have democratic processes for selection and retention of attorneys that resemble in some respects those of academic institutions, but law partners are owners rather than employees of their firms (*cf.*, Gutkin, 2022). Alleged instances of federal judges merely timing their retirements to influence the selection of their successors have been criticized as unethical (see, e.g., Lin and Lat, 2021; Raymond, 2022). Unions provide worker protections but do not generally control hiring decisions, although they may influence hiring in some industries by limiting eligible candidates for employment.

obsolete. Defects attributed to faculty governance include slow, cumbersome, and inefficient decision-making; policy incoherence; capture by special, entrenched, or ideological interests; and lack of accountability. In Thomas Sowell’s assessment, tenure and faculty governance rank “[a]mong the leading institutional liabilities of American colleges and universities”: “In virtually no other institution anywhere is there such a blank check for irresponsibility” (1993: 294-5). Frustration with the costs and content of higher education has elicited proposals to weaken or eliminate tenure and diminish faculty roles in decision making at public universities in several states (Surovell, 2023; Butcher, 2023; Quinn, 2024).

Economists have generally been skeptical of the traditional defense that tenure and faculty governance are necessary for the protection of academic freedom and have offered, instead, several incentive- and risk-based explanations for the privileges accompanying a professorial appointment. Risk and incentive problems are far from peculiar to academic employment, however. There exists, after all, a large personnel economics literature — and larger still principal-agent literature — devoted to risk sharing and incentive alignment in nonacademic settings where the legal default nevertheless remains employment at will. Moreover, academic activities appear especially devoid of the types of relationship-specific investments that motivate the adoption of protective governance arrangements in other contexts. For the most part, neither the courses faculty teach nor the research they conduct is specific to any particular institution. Critically missing from the literature is an explanation for why the reputational forces and standard contracting practices relied on for the vast majority of private sector employment relationships are inadequate to mitigate whatever incentive or hold-up problems exist in academia.

This paper makes three main contributions. First, it identifies a source of hold-up in academic employment that arises from the interplay of the market for “academic capital” — the knowledge and skills that enhance a scholar’s productivity — and the combined research and non-research responsibilities of regular academic appointments *even if* all institutions value individual scholars’ activities identically.² Like

² I use the term “hold up” here in the original sense associated with the transaction cost economics literature (as introduced by Goldberg, 1976) as opposed to its appropriated connotation (originating with Grossman and Hart, 1986, and exemplified in labor economics by Malcomson, 1997, and Acemoglu and Shimer, 1999).

their nonacademic counterparts, educational employers and employees have an interest in bargains that efficiently allocate resources and effort. Thus, as long as the value an institution places on a scholar's time in non-research activities (teaching, administration, clinical work, *et cetera*) exceeds the value of the research time forgone, an administrator's request to perform (extra) non-research activities in exchange for salary (or other benefits) has the potential to leave both the institution and individual better off. But because a scholar's value in the academic market depends on his or her cumulative scholarly output and capacity for future contributions, interruptions in research effort today stand to reduce a scholar's earnings potential over the rest of his or her career, thereby introducing a sequential dimension — and thus reneging hazard — to academic bargains. As in commercial transactions requiring relationship-specific investments, the prospect of hold up in academic employment provides a motive for the adoption of governance structures that enhance participants' confidence in the integrity of their bargains.

Second, the paper directs attention to the critical role of faculty authority over personnel decisions in securing the employment protections conventionally associated with academic tenure. Early 20th-century tenure systems that left the definition and determination of adequate performance exclusively to governing boards and administrators were, in practice, largely indistinguishable from employment at will. It was not until (and where) faculty acquired meaningful authority over appointment, promotion, and dismissal decisions that tenure took on its contemporary significance.

Finally, the paper examines the relationship between research and faculty personnel authority across institutions using institution-level data on publication rates and governance arrangements. Inasmuch as the problem of academic hold up derives from the tension between research and other faculty responsibilities, the value of ceding authority over personnel decisions to faculty will be largest in institutions that have made research an important element of their mission. Histories of American higher education and surveys conducted by the American Association of University Professors (AAUP) show that faculty gained formal authority over personnel decisions only gradually and selectively over the course of the 20th century. Combining responses to AAUP surveys conducted in (or around) 1920, 1940, 1970, and 2001 and data on publications per faculty member over the periods 1900-1940 and 1975-2014, the paper

documents a strong and persistent correlation between publication rates and faculty personnel authority across institutions. Such correlations, of course, leave unanswered questions of causality. Estimates using the marginal treatment effects framework (Heckman & Vytlacil, 2007) provide evidence that the selection (or evolution) of authority over personnel decisions was, at least for a time, significantly related to its expected effect on research productivity. Specifically, the delegation of personnel authority to faculty in 1970 is estimated to have increased expected research productivity among institutions that did so (*i.e.*, had a positive “average treatment effect on the treated”) but would have reduced expected research output at institutions where administrators had retained that authority (a negative “average treatment effect on the untreated”). Although the correlation between faculty authority and publication rates persists, evidence of causal relationship between authority allocations and research productivity disappears by end of the century.

In the next section, I discuss the nature of tenure, its relationship to faculty authority, and their evolution in the U.S. over the course of the 20th century. Section 3 contains a brief overview of existing explanations for tenure and their limitations. Section 4 provides a heuristic model illustrating the nature of the hold-up problem in academic employment relationships. Section 5 contains the empirical analysis. Conclusions and observations follow.

2. The Nature and Diffusion of Faculty Privilege in the 20th Century

In casual usage, academic tenure has come to mean permanent or lifetime employment, with the result that much of both the popular and academic discussion of tenure has focused on the purposes and consequences of guaranteed employment as contrasted with term contracts or employment at will.³ Irrevocability is not, in fact, a feature of academic tenure, however. Rather, “[t]enure, accurately and

³ “In practical terms, tenure is merely an extremely robust form of job protection” (Gutkin, 2022). Most economic analyses of tenure make no or only passing reference to the possibility of termination. For example, McLeod and Urquiola (2021), while acknowledging in a footnote that “[a]s a matter of law, tenure does not guarantee permanence of employment, but rather, sets the bar for dismissal high” (201, fn. 10), nevertheless state in the text that “tenure rewards reaching a threshold level of achievement and cannot be taken away” (199). McPherson and Winston (1983) and McPherson and Shapiro (1993) are exceptions.

unequivocally defined,...provides only that no person continuously retained as a full-time faculty member beyond a specified lengthy period of probationary service may thereafter be dismissed *without adequate cause*” (Van Alstyne, 1971: 328; emphasis in original). The level of job security tenure affords depends ultimately on the criteria that constitute adequate cause and the procedures by which those criteria are evaluated. Although a case can be made that grounds for termination have become so stringent and the removal process so costly that, as a practical matter, acquiring tenure at a modern American university implies effective permanence, the notion that an appointment with “permanent or continuous tenure” confers robust job security was not true for most of the 20th century.

Similar to today, faculty appointments in the 19th and early 20th centuries consisted of a mix of fixed-term (often annual) contracts and positions of “indefinite tenure,” with the trend “clearly — though not universally” toward indefinite-term appointments (Metzger, 1973: 122-3). “Indefinite,” however, meant little more than no specified duration. A professor’s continued employment depended on “supremely vague” criteria and procedures for dismissal (*id.*: 123), and retention in one’s position lay solely at the discretion of outside governing boards and, effectively, over time, in presidents: “Although a professor usually held office indefinitely on good behavior, his tenure depended upon usage and had no legal status: he could be fired at will by the governing board; in many institutions a hearing was not required” (Hofstadter and Metzger, 1955: 230). At most public universities, the standards permitted “removal whenever in the judgement of the board the interests of the college require it” (Metzger, 1973: 127), and courts generally interpreted charters to afford boards — both private and public — near absolute discretion on dismissal decisions (*id.*: 132-134). According to Metzger, the vast majority of dismissals of professors with indefinite tenure between 1860 and 1914 (62 of the 68 he uncovered) occurred without a hearing (*id.*: 128). As late as 1910, “the concept of permanent faculty tenure, though not entirely unknown, was forthrightly accepted by very few university presidents even of leading institutions, and professors were at the mercy of their

superiors to a far greater degree than would be true at the better universities a half-century later” (Veysey, 1965: 305).⁴

Organized advocacy for stronger faculty job security emerged in 1915 with the formation of the American Association of University Professors following a series of controversial turn-of-the century firings. Among the new organization’s first actions was publication of the “Declaration of Principles on Academic Freedom and Academic Tenure” (known informally as the 1915 Statement). To advance its primary aim of protecting faculty from retaliation for expressing views unpopular with trustees and donors, the Statement proposed that “all positions above the grade of instructor after ten years of service should be permanent” (AAUP, 1915: 41). At the same time, however, the Statement’s authors acknowledged that institutions had valid interests in the conduct and performance of faculty that could justify removal. The problem: How to accommodate the legitimate managerial needs of institutions while preventing boards “from imposing their personal opinions upon the teaching of the institution, or even from employing the power of dismissal to gratify their private antipathies or resentments” (*id.* 23).

Rather than “attempt to enumerate the legitimate grounds for dismissal,” the Statement advocated only that each institution specify those grounds “with reasonable definiteness” (*id.*: 41). The challenge was then how to assure the proper application of an institution’s adopted standards (*id.*: 23). Because determinations made by “bodies not composed of members of the academic profession” (administrators and governing boards) would “never be exempt from ...suspicion” (*id.*: 34), protecting faculty from the application of legitimate criteria as pretext for unjustified dismissals or demotions could therefore only be secured through a process of fair hearings before “suitable judicial bodies, composed of members of the academic profession” (*id.*, 40-2). Likewise, “reappointments and refusals of reappointment [of untenured

⁴ Histories of American universities in the late 19th and early 20th centuries are replete with accounts of autocratic presidents (see, e.g., Veysey, 1965: 303-305; Duryea, 1973: 23; Bowen and Tobin, 2015: 29, 39; Gerber: 48-49). Even with the establishment of academic departments —“a logical outgrowth of size and specialization and of the pressing necessity to delegate and decentralize if major administrators were not to find themselves overwhelmed” — the locus of power merely shifted from presidents to department chairs (Duryea, 1973: 31). “The turn of the century was a time of conspicuous departmental dictatorships” as control over appointments and promotions allowed department chairmen to demand personal loyalty and to inhibit rival viewpoints from being expressed in classrooms (Veysey, 1965: 322).

faculty] should be taken only with the advice and consent of some board or committee representative of the faculty” (*id.*: 40).

The framework set out in the 1915 Statement formed, in broad terms, the basis for subsequent AAUP policy statements on academic freedom and tenure — the “1925 Conference Statement on Academic Freedom and Tenure” and the “1940 Statement of Principles on Academic Freedom and Tenure” — which, with the endorsement of the Association of American Colleges, established the template for tenure in American higher education for the rest of the 20th century. Most importantly, the Statements provided that termination of faculty with “permanent” or “continuous” tenure should, with few exceptions, occur only “for cause” and should “require action” (in the 1925 Statement) or “be considered” (in the 1940 Statement) by “both a faculty committee and the governing board of the college”⁵

The adoption of tenure systems began slowly following the 1925 Statement. A 1935 survey of 78 colleges and universities conducted by the president of Rice University found that “fewer than half ... employed formal tenure policies” (Rosenthal, 2011: 2). By contrast, a 1955 survey of 80 mostly private colleges and universities found tenure to be “virtually universal” (Byse and Joughin, 1959: 10). By the end of the century, tenure had become at least nominally available at the vast majority of institutions. A study of academic employment in 1972 found that all but 13 private colleges out of 332 public and private universities and 4-year colleges surveyed provided the opportunity for tenure (Commission on Academic Tenure in Higher Education, 1973: 218-19). Based on that survey, Furniss (1972:1) estimated that 95% percent of faculty worked in institutions having tenure systems. In 1999-2000, 91% of public 4-year degree-granting institutions and all public doctoral institutions had tenure systems; among private nonprofit

⁵ All three Statements made allowances for institutions to “impose upon their faculties doctrinal standards of a sectarian or partisan character” as long as they were “clearly defined and the body or individual having authority to interpret them, in case of controversy, [was] designated.” Exceptions “in the case of institutions of a denominational or partisan character” proved that limitations on the scope and character of instruction are stipulated “in advance, fully understood and accepted by both parties” (1925 Statement). “Limitations of academic freedom because of religious or other aims of the institution should be clearly stated in writing at the time of the appointment” (1940 Statement). The AAUP removed the allowance for religious institutions in 1970 on the grounds that, by that time, “[m]ost church-related institutions no longer need or desire the departure from the principle of academic freedom” (Endnote 5, 1940 Statement). The primacy of faculty in appointment and promotion decisions was formally promoted in the AAUP’s Statement on Government of Colleges and Universities (1966).

institutions, 81% of doctoral institutions, 73% of masters institutions, and 55% of “other” (mostly liberal arts colleges) offered tenure (U.S. Department of Education, 2021: table 316.80).

Even where tenure was available, however, the security it afforded was often tenuous. Tenure policies at many of the 36 institutions with formal systems in the 1935 survey were “weak and indeterminate by modern standards” (Rosenthal, 2011: 2). Byse and Joughin describe the tenure systems in their 1955 survey as constituting “a bewildering variety of policies, plans, and practices” with vague or nonexistent criteria for acquiring and terminating tenure and “insubstantial” legal protections (1959: 69, 133, 136). “Termination procedures [were] clearly the weakest element in the whole tenure picture” (*id.*: 69). Of their 80 respondents, faculty action on recommendations for tenure was required at only 26 institutions (*id.*:141), appeals of tenure denials to a faculty body at only 13 (*id.*: 142).

Surveys by the AAUP in the early 1920s and 1939-40 portray the limited role of faculty in personnel decisions in the first half of the century consistent with historical accounts.⁶ Asked “To what extent and how do the Faculty members participate in the selection of members of the teaching staff?” (AAUP, 1924: 43), respondents to the 1920s reported that faculty participated in hiring decisions at less than a third of the institutions: Of the 167 respondents, 38 reported that faculty had “formal involvement” and another 15 “significant involvement” in the selection of the teaching staff. Asked in 1939-40, “Is faculty [sic] consulted in appointments, promotions, and dismissals? How?” (AAUP, 1941: 156), only a third of the 227 responding institutions reported that faculty were consulted, with 45 reporting no faculty participation and 103 indicating consultation only through appointed department heads. (See tables A.1 and A.2 in appendix A.). Even among institutions classified as having formal participation, faculty involvement in the pre-World War II period typically consisted of little more than an expectation of consultation. For

⁶ The earlier survey was initiated following publication of the 1920 Report of Committee T in March 1921 (AAUP, 1921), suggesting that responses were collected in 1921 to 1923. Responses to the second survey were collected between December, 1938, and December, 1940 (Gerber, 2014: 67; AAUP, 1941) and published in May 1924 (AAUP, 1924). Although the surveys took place earlier, I will refer to the surveys by their publication dates. The earlier questionnaire was addressed to the president of the institution and subsequently submitted to the president for verification (AAUP, 1924: 43). The second survey appears to have been sent to and completed by local AAUP chapters (AAUP, 1941: 157-8). For discussion of the surveys and their implications, generally, see chapter 4 of Gerber (2014).

the most part, administrators were obliged neither to seek faculty opinions nor to abide by their recommendations.⁷ With few exceptions, authority over personnel decisions remained the exclusive domain of boards and administrators throughout the first half century.

Subsequent AAUP surveys, in 1970 and 2001, document significant shifts in faculty authority.⁸ Governing boards always retain ultimate legal authority over institutional decisions but could, and increasingly did, delegate authority to faculty through bylaws, handbooks, or less formal commitments to norms.⁹ To gauge the extent of “faculty participation in college and university government,” the AAUP asked representatives from member institutions to locate actual authority over a range of decision areas among the following categories (AAUP, 1971: 122):¹⁰

Administrator Determination: decisions or actions over which administrators have unilateral authority

Faculty Determination: decisions or actions over which “the faculty of an academic unit or its duly authorized representatives have final legislative or operational authority with respect to policy or action”

Joint Action: decisions or actions that require “formal agreement by both the faculty and other components of the institution” and are subject to “veto by any component”

⁷ The University of Virginia’s response in the 1924 survey illustrates the considerable discretion retained by presidents in appointment decisions: “Before nominating any one for a professorship in the Faculty, the President consults those members of the Faculty who are most likely to have information of value. Generally, the President appoints a Committee of the Faculty to go over the ground and to nominate to him the person or persons who seem to the Committee most suitable for the position” (AAUP, 1924: 96). Only one response to the 1924 survey, for Bowdoin College, contained a seemingly unequivocal statement of faculty determinative authority: “No promotion or appointment made without consent of full Professors” (*id.*: 46).

⁸ Gerber (2014: 84-100; and Appendix) reports on a fifth survey conducted by the AAUP around 1953. Similar to the 1924 and 1940 surveys, the 1953 survey asked only whether faculty were consulted in some manner on appointments, promotions, and dismissals (as opposed to exercising authority), the incidence of which had, according to Gerber, increased compared to 1940, “though the increase was not very large” (93-94).

⁹ Because boards could always revise bylaws or ignore norms, adherence to delegation commitments had to be self-enforcing. On the self-enforcing properties of faculty governance, see Masten (2006: 655-6; 2019: 189-90). Aware that actual practice might deviate from official procedures, the survey instructed respondents to “consider actual practices followed” and defined the form of faculty participation on a given decision category and unit as the “instance in which the level of participation was *least*” (AAUP, 1971: 122; 1970 survey instructions, p. 3 emphasis in original).

¹⁰ The Administrator Determination category was further divided into Consultation, Discussion, and None, depending on the nature and form of communication between faculty and administrators undertaken before a decision is made. For breakdowns of responses among all subcategories and percentages for non-personnel decision categories, see Kaplan (2002a, 2004a) and Masten (2006). To allow for the possibility that authority over decisions might vary among units within a given institution, the survey asked respondents to “give the percentage of the total faculty which belongs to academic units of the institution in which the participation of faculty in the listed decision takes the form indicated” See AAUP (1971: 123), and Masten (2006: 664, n. 25) for more detail.

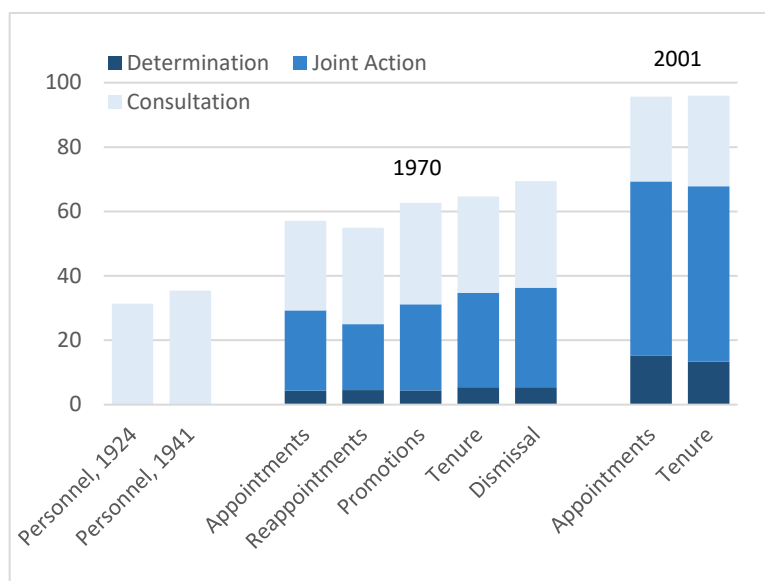


Figure 1. Faculty roles in personnel decisions, percentages

Figure 1 summarizes the reported allocation of authority for the personnel decisions included in the 1970 and 2001 surveys along with responses to the two pre-War surveys (the first two (light blue) bars) discussed above. The 1970 survey included questions about authority over appointment, reappointment, promotion, tenure, and dismissal decisions while the 2001 survey asked only about appointment and tenure authority. In 1970, faculty had acquired effective authority — either exclusively (darkest blue shading in the center bars of figure 1) or jointly with administrators (medium blue shading) — over personnel decisions at subsets of institutions ranging from 25% for reappointment decisions to 36% for dismissal decisions. Faculty at another 30% or so of institutions could expect to be consulted on personnel decisions (indicated by the light blue bars), but administrators at those institutions ultimately retained unilateral authority over such decisions. Overall, administrators exercised exclusive authority over personnel actions at two-thirds to three-quarters of the responding institutions in 1970. By 2001, however, those proportions had roughly reversed, at least for appointment and tenure decisions. Faculty exercised authority over appointment and tenure decisions at just under 70% of institutions entering the 20th century.¹¹

¹¹ See tables A.1.3 and A.1.4 in appendix A for breakdowns of the number of respondents to each question in the 1970 and 2001 surveys. Approximately 520 institutions responded to both surveys. The percentages using just the subset of institutions that responded to both surveys are almost identical to those for all respondents in both periods.

Except for the structure imposed by the semester duration of courses, academic employment at the close of the 19th century was not fundamentally different from other employment. Hiring and retention were exclusively at the discretion of the academic equivalents of directors and officers. That clearly changed, gradually and unevenly, over the course of the 20th century. The question is why the tradeoffs associated with conferring the job security and personnel authority favored faculty — and only *some* faculty — obtaining such privileges.

3. The Economic Logic of Faculty Privilege

Despite having played a prominent role promoting tenure in the cause of protecting academic freedom entering the 20th century (Tiede, 2014), economists have been skeptical that academic freedom considerations justify academic tenure. Henry Hansmann summarizes both the traditional rationale and the skepticism with which it is regarded by many economists (2012: 177; internal citations omitted):

The conventional argument for tenure in higher education is that it provides the protection needed for faculty members to address controversial topics in both teaching and research. As others have pointed out, however, this is not a particularly persuasive justification. Lifetime tenure is neither necessary nor sufficient to protect intellectual freedom in colleges and universities, including in particular the freedom to express socially or politically unpopular views.

Critics note, for example, the absence of comparable protections for other employees engaged in controversial activities or expression. Thomas Sowell (less skeptic than detractor) contrasts the pressures to abandon controversial topics in universities with the experience of think tanks “which have no tenure but which have produced some of the most controversial writings of our times, including fundamental challenges to the orthodoxy pervading academic social science departments” (1993: 274).¹² Nor have recent, highly-publicized “cancellations” of journalists and editorialists for expressing unpopular views produced a groundswell of calls for a journalistic analog to academic tenure.

¹² Among others expressing such skepticism are Jason Brennan and Phillip Magness, who call the academic freedom justification for tenure “moral grandstanding” (Brennan and Magness, 2019: 142); and Roger Meiners, who dismisses as “Balderdash” the argument that there is something “special” about college teachers that distinguishes them from other professionals “involved in high-stakes arguments” (2019: 121-2). See also blog posts on tenure by Gary Becker (2006a,b) and Richard Posner (2006a,b).

Modern economic analyses, which have tended instead to emphasize tenure's incentive implications, can be broadly divided into two strains.¹³ The first emphasizes tenure's effects on the incentives of individual faculty to exert effort or to invest in often highly specialized research with uncertain payoffs. Examples include McPherson and Whinston (1983), Ito and Kahn (1986), and more recently, MacLeod and Urquiola (2021). The second treats tenure as ancillary to the role of faculty as institutional decision makers: Institutions delegate decision authority to faculty either because only faculty possess the knowledge and expertise necessary to evaluate increasingly specialized teaching and research or because nonprofit and public institutions lack shareholders with interest in monitoring boards and administrators. Tenure, it is argued, promotes more efficient exercise of that authority. A well-known example is Carmichael's (1988) argument that, without the security of tenure, professors would be reluctant apply their expertise to identify the best candidates lest they be replaced by their new superior colleagues (see also Dnes and Garoupa, 2005). In Brown's (1997) version, tenure provides faculty an interest in the long-run success of the institution by lengthening time horizons and the job security necessary to effectively monitor and evaluate administrators in institutions lacking shareholders to perform those functions.

The incentive issues associated with tenure in the economics literature are, for the most part, intuitively plausible. What the literature fails to establish is that the existence or severity of these issues distinguish academic from other employment. Employment in higher education is not obviously riskier (or faculty systematically more risk averse) nor are the incentive problems obviously more acute than in other sectors of the economy. Indeed, for each incentive problem associated with academic employment an analog exists in the broader principal-agent literature. Motivating research and innovation, for instance, is hardly a problem limited to higher education (see, *e.g.*, Levin, 2003; Lerner and Wolf, 2007; MacLeod, 2007; Manso, 2011). Yet the solutions proposed to motivate innovation outside of academic settings rarely

¹³ Brown (1997) and Meiners (2019) provide more detailed overviews of the development of tenure along with assessments of existing economic rationales. Other summaries and overviews of the economics literature on tenure include McPherson and Shapiro (1999); McPherson and Winston (1983), and Siow (1998). Briefer but still useful summaries can also be found Brogaard et. (2018) and MacLeod and Urquiola (2021).

if ever include tenure.¹⁴ Similarly, the problem of decision maker reluctance to hire high-quality employees is not exclusive to academia. “Managers who fear being replaced by their subordinates [and therefore] have an incentive to recruit and develop weaker but less dangerous subordinates” is a general problem in hierarchical organizations, according to Friebe and Raith (2004: 239). But, unlike academia where lifetime employment may be optimal, “employment guarantees are rarely offered in firms that have to survive in a competitive environment” (*id.*, 237). Nonprofit colleges and universities lack owners to monitor management, as Brown (1997) observes, but so do other nonprofit organizations, which do not generally delegate collective authority over employment decisions to (non-managerial) employees or grant employees job security analogous to tenure.¹⁵

Finally, it is difficult to explain why reliance on the labor market to discipline behavior by employers and employees generally is inadequate for academic employment in light of the large number of institutions and paucity of relationship-specific investments in higher education. Table 1 shows the number of four-year degree-granting public and nonprofit postsecondary institutions in the United States from 1900 to 2010 (at ten-year intervals plus 2014-15). As seen in the table, the higher education market in the United States has consisted of large numbers of institutions throughout its modern history and has experienced significant entry over time.¹⁶ Impediments to labor mobility exist in academia as in every occupation. A claim that mobility impediments are much greater in academia is hard to sustain, however, given the lack

¹⁴ Manso (2011: 1849) does allude to “research departments in business ... organizations [that] often grant tenure to their researchers” but does not provide evidence or support for the practice, and I am unaware of any business organizations that do so.

¹⁵ Brown’s position that faculty best represent long-term institutional interests will likely also strike many with experience in higher education as, at a minimum, unproven. It is even a matter of dispute whether tenure protects faculty criticism of administrators or university policy (Whittington, 2023).

¹⁶ The net increase in institutions understates entry because of closures and mergers. The National Center for Education Statistics reports that 544 4-year degree nonprofit institutions (plus eight public institutions) closed between 1969 and 2019 (U.S. Department of Education, 2020: table 317.50). Historical accounts describe an industry characterized by experimentation and dynamism (see Veysey, 1965: 330; John R. Thelin, 2004: 110–13). Bennett (2014: 513-17) characterizes 19th-century American higher education as one of ease of entry, proliferation of new institutions, high level of experimentation, significant failure rate, and overall competitiveness.

Table 1. Public and Nonprofit Postsecondary Institutions, 1900–2015

Year	Public	Private	Commissioner of Education Report Total	NCES Total ^a	Governance Sample Institutions ^h
1899-1900	89	520	609^b	977 ^c	733
1909-10	89	513	602^d	951 ^c	824
1919-20	149	567	716^e	989	873
1929-30	251	690	941^f	1,132	932
1939-40	306	874	1180^g	1,252	965
1949-50	344	983		1,327	1014
1959-60	367	1,055		1,422	1071
1969-70	426	1,213		1,639	1128
1979-80	549	1,376		1,925	1139
1989-90	595	1,479		2,074	1141
1999-2000	614	1,531		2,145	1141
2009-10	672	1,539		2,211	1141
2014-15	701	1,584		2,285	1141

Sources and notes:

^a National Center for Education Statistics (Snyder 1993: Table 26); and *Digest of Education Statistics 2019* (Table 317.10). NCES publications did not report public and private figures separately before 1949-50. Data for years before 1974-75 include main campuses only. Data for later years include both main and branch campuses. Inclusion of branch campuses increased the number of public institutions by 85 and private institutions by 9 in 1979-80.

^b Figures are for 1900-01, *Report of the Commissioner of Education, 1900-1901*, p. 1611; Table 29, pp. 1652-1671; Tables 32, 34 (colleges for women; pp. 1707, 1710-1714); Tables 36 (schools of technology, pp. 1720-1721)

^c Includes unknown number of 2-year colleges.

^d Source: Report of the Commissioner of Education, 1911, vol. II, p.843.

^e Source: Biennial Survey of Education, 1920-22. Chapter IV, p. 295.

^f Includes 124 public and 6 private degree-granting teachers colleges. Source: Biennial Survey of Education, 1930-1932, Table A. p. 6.

^g Includes 165 public and 21 private degree-granting teachers colleges. Sources: Biennial Survey of Education 1938-1940; 1940-1942 Vol. 2, Chapter IV, Table I., p. 2.

^h Pre-1940 totals include some junior colleges, normal schools, and other institutions that would later become, but were not yet, four-year degree granting colleges.

of institution-specific investments that motivate the adoption of specialized governance structures in other settings. Although academic research has become increasingly specialized, it is rarely specific to a particular institution.¹⁷ Novel scientific discoveries, theoretical advances, musical compositions, and so forth, are unlikely to be significantly more highly valued at one institution than another. Research that addresses a particular local issue (for example, the state of the local economy) and scientific projects that require expensive equipment, laboratories, or personnel that cannot be easily relocated or replicated elsewhere except at large cost might constitute exceptions. But such exceptions do not clearly differentiate academic from commercial activities and organizations.¹⁸ The vast majority of us could teach the same courses and do the same research at pretty much any of the thousands of colleges and universities in the United States. In Siow's assessment, it is the *lack* of significant institution-specific investments that distinguishes academic employment (1998: 153, 162). "The problems of specialization, obsolescence, and asymmetric information are not unique to academia," he concludes, yet in no other industry do firms adopt to its "distinctive organizational features" (*id.*, 170).

4. The Stakes Are Not So Small

To highlight that the source of hold-up in the depiction of academic employment that follows does not lie in any specificity in a scholar's research or in other impediments to labor mobility, I assume that all institutions value the services and academic capital of a given professor, i , identically, that the market for faculty is competitive, and that relocation between universities is costless.¹⁹ During any given period, t ,

¹⁷ McPherson and Winston (1983), for example, identify the specialized nature of academic research as motivating the need for tenure as commitment device. Elaborating on McPherson and Winston, Siow argues that a university would not be willing to pay faculty upfront to invest in "specialization [that] is valuable to the industry" because "the individual can leave the employer [i.e., university] after the payment" (1998: 155). Given that such disciplinary specialization is typically not specific to an institution, however, there is no reason why an employing university would have to pay an individual to undertake the investment in the first place.

¹⁸ Specialization combined with institutional quality stratification can inhibit mobility by reducing the likelihood of finding suitable positions at institutions of comparable status and resources within increasingly narrow fields and subfields, thereby complicating the matching problem. But ranked differences in quality, however measured, are significant only among elite institutions — the top 50, or possibly 100, of the more than 2,000 colleges and universities.

¹⁹ Although different in other respects, the *absence* of institution-specific investment and the public nature of a scholar's research record are also features of Siow's analysis of tenure, which posits "a role of tenure is to induce

faculty divide their available time, T , between scholarship, s_t , and non-research activities, τ_t , so that $T = s_t + \tau_t$. (Non-research activities might include teaching, various forms of service such as committee or administrative work, patient care, and any other activities a university values. Because only the total amount of time spent on non-research activities matters for the analysis, it is convenient to assume that both faculty and universities are indifferent to the division of time among non-research work.) To simplify further, I will assume that faculty allocate their time between research and non-research activities to maximize their income over their careers. (Allowing utility from the consumption of research activities would not change the implications of the analysis.)

For their part, universities value both research and the non-research services that faculty provide. The value universities place on professor i 's non-research activities in time t will be denoted w_{it} , which, given the assumption of competition and costless relocation, can also be thought of as the competitive wage for individual i 's non-research services.

Universities also value faculty for the research they produce. (The sources of that value are various and disputed: to contribute to societal progress, for prestige, to satisfy preferences of donors, legislatures, and other funding sources, among other possibilities.) I will assume here that the value universities place on a particular scholar is related to that individual's "academic capital," A_i , which, analogous to human capital more generally, embodies the knowledge and skills that enhance an individual's ability to produce output, in this case, academic research. Not being able to own their employees, universities can only "lease" the research services of academics. Define the "rental" universities are willing to pay for scholar i in period t to be

$$v_{it} = v(A_{it}),$$

where A_{it} is the stock of academic capital of scholar i in period t . A scholar's stock of academic capital at any point in time is observable. As with compensation for non-research activities, competition assures that

older professors, whose research productivity has fallen but by less than their peers, to do less research" (1998: 162-4).

the per-period “rental rate” for a scholar with academic capital A_{it} is the same across institutions. (Note that v_i and w_i have subscripts for individual faculty, i , but not for institutions since all institutions are assumed to value faculty services identically.)

As with other types of human capital, academic capital requires investment to create and, without maintenance, will depreciate over time. A scholar’s academic capital at a point in time can be represented as

$$A_{it} = A_{it-1} - \delta_i A_{it-1} + a_i(s_{it-1}; A_{it-1}, d_i). \quad (1)$$

In words, an individual’s current stock of academic capital equals last period’s stock, A_{it-1} , less depreciation, $\delta_i A_{it-1}$, plus additions acquired through investments in new capital, $a_i(\bullet)$. Depreciation of academic capital, at rate δ_i , occurs, in part, because knowledge and skills previously acquired become obsolete with new discoveries, advances in theory, and changes in technology. Academic capital may also diminish because prior knowledge is forgotten (owing to imperfect memory) or skills atrophy with disuse.²⁰

The final term in the equation (1), $a_i(\bullet)$, represents an academic capital production function. The first term in that expression, s_{it-1} , reflects the contribution of time spent on research in the preceding period to today’s stock of capital, $a'_i > 0$. Conducting research helps to maintain a scholar’s research skills, keeps the scholar abreast of current literature, and permits the acquisition of new knowledge and abilities. (In this respect, human capital differs from physical capital, the value of which generally declines with use.) The remaining terms in $a_i(\bullet)$ are intended to capture the effect of a scholar’s existing academic capital, A_{it-1} , on

²⁰ Alternatively, or in addition, institutions may simply value older research less than more recent publications.

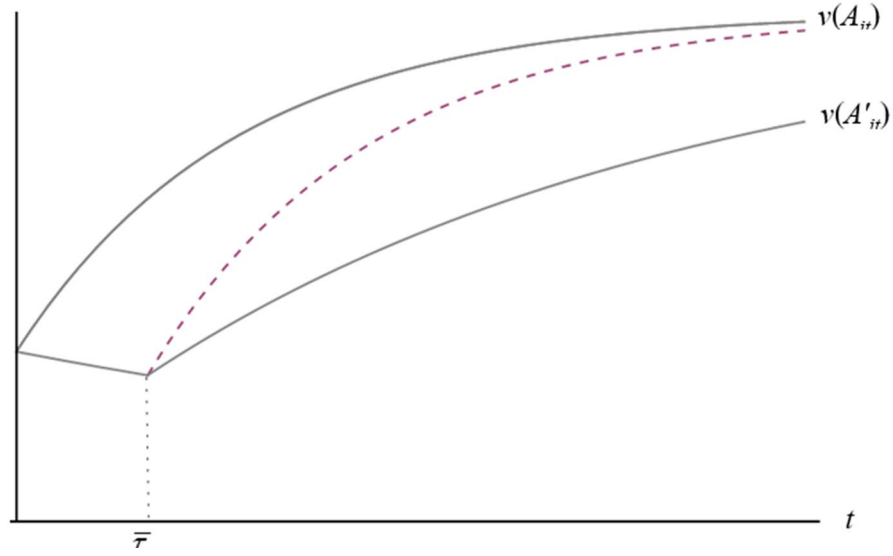


Figure 2. The Value of Academic Capital over Time

his or her ability to develop new academic capital (as opposed to producing current research), and a possibly separate rate, d_i , at which this ability to acquire new academic capital (e.g., the capacity to learn new techniques for conducting research) decays.

Figure 2 illustrates the effects of an interruption in time spent on research on the value of a scholar's academic capital over a scholar's career. The curve $v(A_{it})$ represents what the value of a scholar's academic capital would be in the absence of an interruption in time devoted to research. An interruption of, say, length $\bar{\tau}$ stands to have three separate effects on a scholar's realized market value relative the original curve $v(A_{it})$. First, even if no depreciation were to occur, time away from research delays the production of research and publications; work that would have been produced at time 0 will not appear until time $\bar{\tau}$, shifting the curve $v(A_{it})$ horizontally to the right by $\bar{\tau}$ (not illustrated). Second, time away from research prevents the maintenance and enhancement of academic capital, resulting in depreciation of the stock of a scholar's academic capital, depicted in the illustration by the negatively-sloped line from the vertical axis, followed by the upward-sloping dashed curve. Finally, research interruptions can make it harder to accumulate new

academic capital, represented by the slower rate of growth of the curve $v(A'_{it})$, which incorporates all three of the above effects.

The main implication of equation (1) and the illustration in figure 2 for the present analysis is that reductions in time spent on research, s_{it} , reduce the value of a scholar's academic capital over his or her remaining career. As a result, the cost to a scholar of additional time spent on non-research activities in period, τ_{it} , is not the current "rental" price of the scholar's academic capital, v_{it} (plus any reduction in utility derived from the act of conducting research, if relevant) but the present value of the reduction in v_{it} over that individual's career horizon: the (discounted) difference between $v(A_{it})$ and $v(A'_{it})$ in figure 2.

A bargain between an administrator and professor that reallocated faculty time from research to other activities would be efficient if the value to the institution of those other activities exceeded the opportunity cost to the scholar. The problem arising from the durability of academic capital is how to accomplish the transfer necessary to effect that bargain. A scholar's current of academic capital is observable, but an individual's capacity to produce new academic capital, $a_i(\bullet)$; rates at which old capital and learning capabilities depreciate, δ_i and d_i ; time horizon; time actually spent on research, s_i ; and how the market will value of a particular scholar's academic capital in the future will typically not be. Although administrators and faculty could, in principle, negotiate lump-sum payments that compensate faculty upfront for the present value of forsaken future earnings as occasions for efficient bargains arose, doing so would require repeated individualized bargaining in the presence of uncertain and idiosyncratic future paths of both $v(A_{it})$ and $v(A'_{it})$. Transferring the potentially large sums needed to effect such bargains would also expose institutions to renegeing by scholars who, having acquired compensation upfront, might withhold promised services and avail themselves of market options.²¹ Administrator promises to pay scholars what would they would have earned, meanwhile, would avoid the costs of bargaining over lump-sum transfers

²¹ Allowing administrators to make ad hoc cash side payments in exchange for faculty investments — in a "pay-as-you-go" fashion — would also likely violate the non-distribution constraint that characterizes not-for-profit organization and generally weaken safeguards against misappropriation of institutional resources (Hansmann, 2012: 162). Enhancing the ability of administrators (or a majority faction) to target rewards and retaliation selectively through ad hoc transfers may also impede the coordination of collective responses to administrator opportunism (see Masten, 2006: 655-6).

(and the need to forecast a scholar's realized market value, $v(A'_{it})$). But such promises would lack credibility given the limited job tenure of administrators, an institution's ability (absent tenure) to renege on promised compensation through termination (or nonrenewal), and the impossibility of knowing, much less contracting on, an individual's counterfactual market value over time, $v(A_{it})$.²²

As with commercial transactions involving relationship-specific investments for which conventional contracting arrangements prove inadequate, specialized governance structures that “attenuate opportunism and otherwise infuse confidence” stand to increase the gains realizable from academic exchanges (Williamson, 1979: 242). Tenure, in its common understanding of permanent or lifetime employment, protects academic bargains from one manifestation of opportunism: administrator termination of employees as a means to evade paying promised future compensation. But an income guarantee that is not contingent on continued service — a sinecure in effect — simply shifts the locus of hold up from administrators to faculty, freeing the latter to renege on job responsibilities without financial repercussion. The challenge posed for academic governance is settling on parameters of satisfactory performance, and procedures for their evaluation, in which both sides have confidence.

Recognition of the existence of persistent effects of interruptions in research activity on research productivity and career earnings is not novel. Empirical studies of academic employment have attempted to quantify the effects of higher course loads and administrative work on research productivity (e.g., Goodwin and Sauer, 1995; and Taylor et al., 2006) and on compensation (e.g., Fender et al., 2015). Studies have also shown that the effects of research interruptions vary among disciplines and fields (McDowell, 1982; Levin and Stephan, 1991; Ragan and Rehman, 1996), with consequences generally found to be larger in sciences and more technical fields (e.g., McDowell, Singell, and Stater 2011; Anauati, Galiani, and

²² Dnes and Garoupa (2007) posit damages for breach of tenure contracts that would leave a professor “in the same position as if the tenure contract had been honored,” calculated as the difference between current earnings and “those in the next best occupation” (2007:838). Damages relevant to the bargain contemplated here, by contrast, would need to be measured relative to how much a professor would have earned had he or she not sacrificed research time to perform additional non-research activities, in the model above, the difference (in present value) between $v(A_{it})$ and $v(A'_{it})$. Even if prospective earnings in a scholar's current (or comparable) job could be reasonably estimated, the value of a scholar's career had he or she devoted more time to research would be purely speculative, precluding the use of standard damage remedies to secure such academic bargains.

Gálvez, 2016; and Galiani, and Gálvez, 2017), where knowledge is likely to depreciate at faster rate. What seems not to have been fully appreciated is the hold-up potential attributable to the combination of research and non-research activities and its implications for academic governance. Notably, in this regard, neither research nor multiple responsibilities alone are unusually problematic. Many occupations involve research — including, for example, some non-instructional research scientist positions within universities and affiliated hospitals — but do not pose the tradeoffs (thereby occasioning the governance responses) identified here. Nor does the problem arise solely because employees have multiple responsibilities. “Multi-task” jobs are also common, but in few, if any, does the allocation of time between tasks have such direct and long-lasting effects on an employee’s earnings path. Other university employees, such non-faculty administrators, administrative staff, and instructional and clinical faculty for whom research is not a primary responsibility, are not similarly exposed to the tradeoff described above; nor are they generally afforded the protections and privileges of regular faculty.

5. Research and Faculty Privilege

Historians of American higher education have long noted the emergence of research as a major function of postsecondary educational institutions beginning in the late 19th century:²³

[I]n the 1870’s research played no important role in American higher education. . . . Around 1880 a definite change occurred. . . . Ten years later research had become one of the dominant concerns of higher education. . . . As far as official demands upon faculty were concerned, by 1910 research had almost fully gained the position of dominance which it was to keep thereafter (Veysey, 1965: 174–5, 177).

In the opinion of educators, faculty should be responsible for both teaching and research. Observing that “the old distinction between ‘teaching men’ and ‘research men’ was becoming increasingly untenable in the research universities,” Geiger (1986: 75) quotes the president of Yale in 1910 counselling, “There is

²³ According to Golding and Katz, “[T]he changes to the structure of knowledge that shook higher education from around 1880 to 1910 . . . created complementarities between research and teaching. Institutions of higher education that engaged in research activities were suddenly able to provide teaching services at lower cost — they could spread their research base to benefit their teaching” (1999: 49). See Goldin and Katz generally for overview of developments in American higher education between 1890 and 1940.

nothing more fatal to the efficiency of a department than the maintenance in its teaching force of a number of reasonably good instructors who are kept because they can teach moderately well, but who have little promise of inspiring either associates or their students to work of really high grade and who keep out from the faculty men of less experience but more promise.”

Although the expansion of tenure rights and faculty authority described in the preceding sections paralleled the increasing emphasis on research over the course of the 20th century, neither the weight placed on research nor the delegation of decision authority progressed uniformly among institutions. In the remainder of the paper, I explore the relationship between research and governance using data on publication rates of faculty at individual institutions over the periods 1900 to 1940 and 1975 to 2014. Conveniently, for purposes of this study, the available data on both publications and faculty numbers roughly span the dates of the four AAUP studies discussed in the previous section.

5.1. Data

The primary data for the empirical analysis consist of the responses to the four AAAP governance surveys summarized earlier (in section 2) and a measure of publications per faculty member. Institutions included in the analysis — hereafter, referred to as the “governance sample” or “sample institutions” — responded to at least one of the four governance surveys.²⁴ The right-hand column in table 1 reports the number of sample institutions in existence over time based on their founding dates.²⁵ Table 2 summarizes the types and control of these sample institutions as of 1970.²⁶

Governance measures. For the pre-War surveys, a pair of categorical variables, *Consultation_24* and *Consultation_41*, indicate whether faculty were consulted on personnel decisions based on Gerber’s

²⁴ A small number of responding institutions are excluded from the sample. Primary reasons for exclusion include missing data (particularly lack of data on faculty counts) and absence of identifying codes (usually because an institution closed before identification codes (fica or unitid) were introduced). Also excluded were three military service academies, and Columbia Teachers College (for which data separate from Columbia University were not available).

²⁵ Because founding dates often precede the year an institution began offering postsecondary education, the figures in the right-hand column of table 1 overstate the number of postsecondary institutions in the sample in earlier years.

²⁶ Institution classifications and, occasionally, control change over time.

Table 2. Sample Institutions by 1970 Classification and Institutional Control

Carnegie Classification, 1970	Control				Total
	Private	Public	Catholic	Other religious	
Doctoral universities	43	107	11	7	168
Specialized - technology	7	5	-	-	12
Comprehensive institutions	45	272	40	46	403
Liberal arts colleges	101	23	101	252	477
Specialized - other	10	3	2	8	23
Junior	6	16	3	19	44
Founded post-1970	1	11	-	2	14
Total	213	437	157	334	1141

Notes: “Specialized – other” consists primarily of four-year degree granting institutions specializing in business, arts, or music and theological seminaries. The 1970 Carnegie Commission classification system defined the category “Comprehensive Universities and Colleges” as institutions offering primarily liberal arts programs but including one or more professional or occupational programs conferring master’s degrees. This category was relabeled as “Master’s Colleges and Universities” in the 1994 and later classifications. The 44 institutions classified as “Junior” were all four-year degree granting institutions as respondents to the 2001 AAUP survey.

(2014) coding. (See the discussion in section 2; the first two columns in figure 1; and tables A.1.1 and A.1.2 in Appendix A.1 for details and descriptive information.)

For purposes of the analysis, I have recoded the faculty authority responses from the 1970 and 2001 surveys to equal to 1 for responses indicating that faculty had either exclusive or joint authority over at least some decisions within a given the decision area.²⁷ Figure 3 (a rough analog to the 1970 and 2001 bar graphs in figure 1) shows the distribution of responses using this recoded measure. The dark blue bars represent the percentage of responses indicating faculty had exclusive or joint authority over all decisions within a category, and the light blue bars represent the percentage indicating faculty had exclusive or joint authority over at least some decisions in the category. The percentages of responses for the variable *Faculty authority* used in the empirical analyses that follow are represented in figure 3 by the sum of these shaded areas for each decision area. Descriptive statistics corresponding to figure 3 are reported in tables A.1.3 and A.1.4 of Appendix A.1.

²⁷ As noted earlier, the 1970 and 2001 survey designs allowed respondents to report percentages of faculty falling within each authority category. Alternative coding schemes (e.g., different cutoff percentages) had little effect on results.

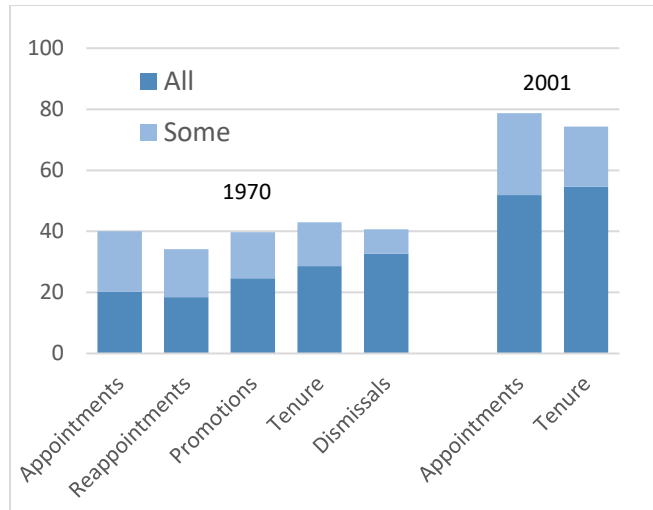


Figure 3. Faculty authority over some or all personnel decisions, percentage of institutions, 1970 and 2001

Publication counts. Publication data were extracted from the Web of Science Core Collection database (hereafter referred to as the WoS database). As described in more detail in Appendix A.2, the WoS database has a number of well-known limitations. Most significant for present purposes is that WoS publication records capture the institutional affiliations of a publication’s authors — needed to assign publications to institutions — only for 1900 to 1944 and beginning again around 1973, and only for the subset of publications covered by the WoS. As a result, the WoS data significantly undercount total publications by faculty at an institution, particularly for 1900-1940 period. (See table A.2.1. in Appendix A.2 for information on the fraction of WoS records containing institutional affiliations over time.) Although the incompleteness of affiliation information, combined with changes in WoS journal coverage over time, limit the use of the publication counts for time series analysis, cross-sectional implications should be valid to the extent that WoS coverage and collection practices applied consistently across institutions.

Faculty counts. Data on the number of faculty were extracted (at approximately five-year intervals) from U.S. federal government reports for the period 1900 to 1940 and from the National Center for

Table 3. Descriptive statistics

	Mean	s.d.	Min	Max	obs.
Founding year ¹	1887.5	45.6	1636	1985	1,141
Faculty size, 1900	34.7	49.2	3	483	411
Faculty size, 1910	56.3	84.9	1	652	438
Faculty size, 1920	80.6	127.6	5	1006	507
Faculty size, 1930	110.9	195.3	7	1849	641
Faculty size, 1940	114.3	208.8	1	1978	903
Faculty size, 1975	226.7	293.2	4	2050	1,093
Faculty size, 1995	260.7	317.3	4	2225	1,134
Faculty size, 2001	279.8	336.9	4	2551	1,131
Faculty size, 2014	350.4	432.0	4	3506	1,122

Avg. pubs per faculty	Mean	s.d.	%=0	Max	obs.
1900	0.008	0.031	87%	0.45	411
1910	0.011	0.042	82%	0.56	438
1920	0.012	0.046	79%	0.48	507
1930	0.018	0.065	73%	0.84	641
1940	0.020	0.062	67%	1	903
1975-1984	0.25	0.54	3%	5.21	1,132
1985-1994	0.28	0.57	2%	5.56	1,137
1995-2004	0.32	0.64	1%	6.04	1,135
2005-2014	0.34	0.66	1%	6.08	1,131

¹ Of 1,141 sample institutions, 727 (64%) were founded before 1900. Founding dates often do not correspond when an institution first began to offer postsecondary education.

Education Statistics IPEDs database (supplemented by AAUP data, institutional websites, and other ad hoc sources) for the modern period.²⁸ Table 3 contains descriptive statistics for institutional founding years (used as a control) and for faculty size and publications per faculty member for select years. (See Appendices A.3. and A.4 for additional information on sources.)

5.2. Research and authority

5.2.a. Early 20th century. Figures 4.a and 4.b plot mean publications per faculty member by whether faculty were consulted on personnel decisions as reported in the 1924 and 1940 surveys. As seen in the figures,

²⁸ On the empirically supported assumption that the number of faculty at an institution adjusts only gradually over short intervals, faculty counts between reporting intervals and for missing data were interpolated from closest adjacent values. See Appendix A.3 for details.

Table 4. Publications per faculty, 1900-1940		
	Coefficient	<i>s.e</i>
Consultation, 1924		
linear ¹	0.0132	0.01044
tobit	0.0358	0.01745**
Obs.: 5,523		
Institutions: 142		
Consultation, 1940		
linear ¹	0.0146	0.00750*
tobit	0.0337	0.01398**
Obs: 6,692		
Institutions: 207		
Included: Year fixed effects; Control		
Unbalanced panel; vce standard errors clustered on institution		
* p<0.1, ** p<0.05		
¹ Random-effects GLS regression		

mean publication rates were higher at institutions where faculty were consulted on personnel decisions. Table 4 reports coefficients and standard errors from estimation of publication per faculty as a function of whether faculty were consulted for institutions that participated in the early surveys controlling for institution control or affiliation (private, public, Catholic, other religion) with year fixed effects. The tobit estimates (more appropriate given that roughly half of the observations had zero publications in each subsample) show statistically higher publication rates for the 45 (of 142) sample institutions that reported the existence of formal procedures for faculty consultation on personnel matters in the 1924 survey, and for the 74 (of 207) that did so in the 1941 survey.

The observed correlations between consultation and publication rates are consistent with greater interest in faculty expertise in institutions emphasizing research. But because consultation does not constrain administrator discretion, the correlations could reflect expediency on the part of still autocratic administrators. As scholarship became increasingly specialized, boards and presidents of institutions that wished to incorporate research in their missions would likely have found it desirable to “at least to consult with departmental faculty who had the relevant expertise in order to make an informed evaluation of the credentials of individuals being considered for appointment or promotion” (Gerber, 2014: 78). Higher

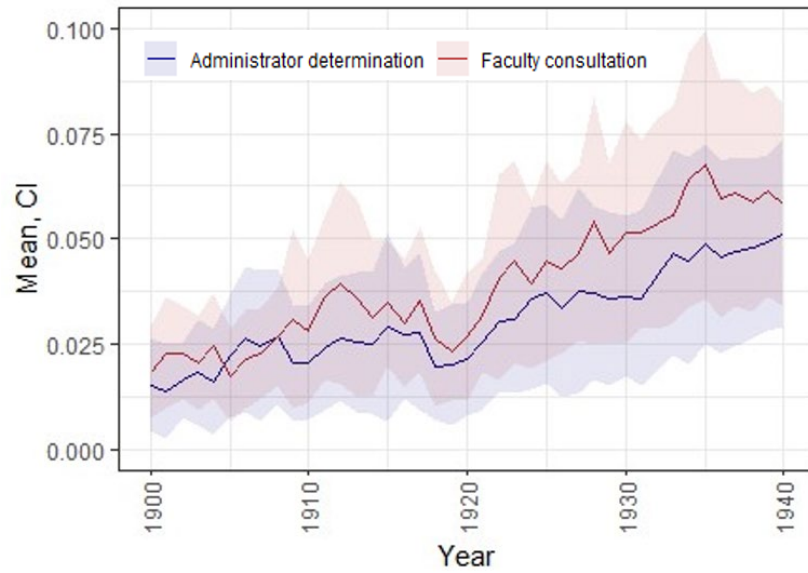


Figure 4.a. Mean publications per faculty member, 1900-1940, by consultation in 1924. (unbalanced panel with 95% confidence intervals)

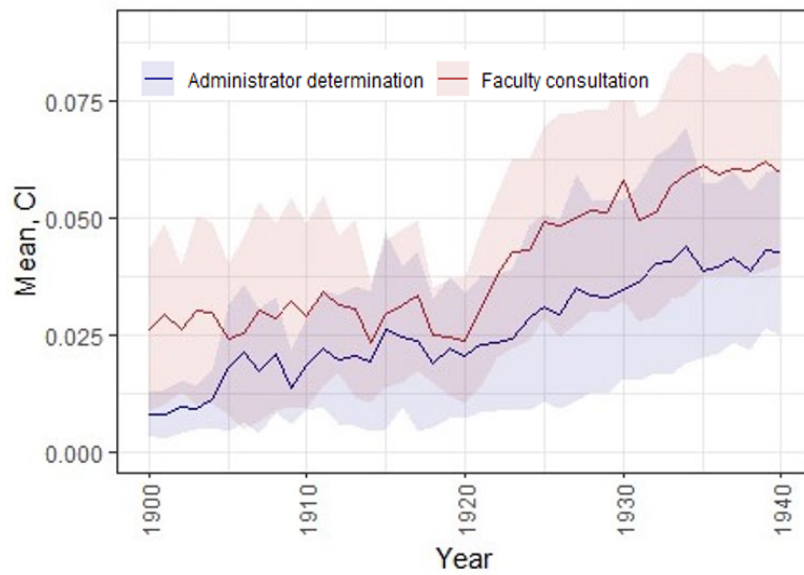


Figure 4.b. Mean publications per faculty member, 1900-1940, by consultation in 1941 (unbalanced panel with 95% confidence intervals)

research output may have simply been the result of making more informed decisions concerning the selection and retention of faculty by following faculty advice.

5.2.b. Late 20th century. As previously described, faculty had gained effective authority over personnel decisions at significant numbers of institutions by the 1970s and at a majority of institutions by 2001. Comparisons of authority over personnel decisions and publication rates show a consistent pattern throughout the later part of the century. Mean publication rates at institutions at which faculty exercised authority over personnel actions (either independently or jointly with administrators) in the surveyed decision areas are consistently higher than at institutions where administrators exercised exclusive authority.

1970 authority. Figures 5.a. and 5.b show means of publications per faculty member (with 95% confidence intervals) over 1975-2015 by whether faculty exercised authority over appointment and dismissal decisions in 1970, respectively. (Plots using authority over reappointment, promotion, and tenure decisions in 1970 yield similar diagrams.) Figures 6.a-c show that faculty authority is associated with higher mean publication rates within the three largest institutional categories — doctoral universities, comprehensive universities, and liberal arts colleges — as well. Although the difference is not consistently significant among the subset of doctoral universities, doctoral institutions are, by definition, research-focused and are most likely to afford faculty authority over personnel decisions. In effect, classification as a doctoral institution identifies an institution as research intensive.²⁹

²⁹ Out of 136 doctoral universities that responded to the 1970 survey, 98 (72%) delegated authority over some or all appointments to faculty, compared to 33% of 325 comprehensive institutions and 34% of 290 liberal arts colleges. Coefficients on faculty appointment and promotion authority are significant at the 5% level, and tenure authority at the 10% level, after controlling for Control (public, private, Catholic, or other religious).

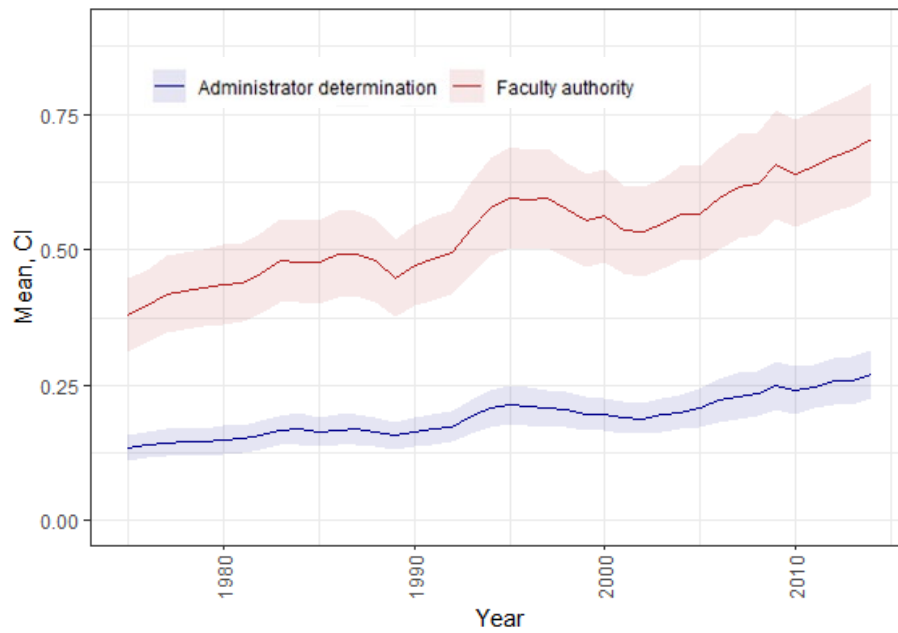


Figure 5.a. Publications per faculty, 1975-2014, by 1970 appointment authority, all respondents, unbalanced panel; means and 95% confidence intervals (n=785)

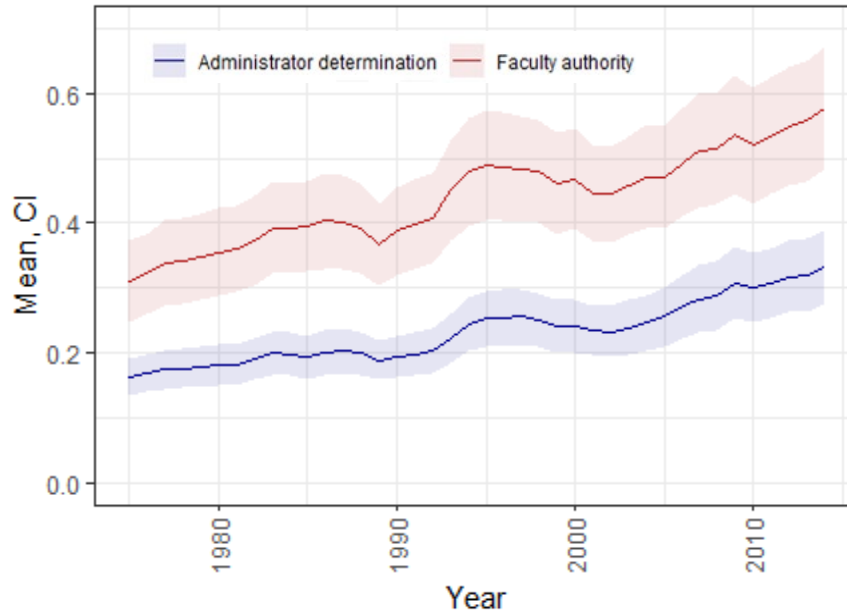


Figure 5.b. Publications per faculty, 1975-2014, by 1970 dismissal authority, all respondents, unbalanced panel; means and 95% confidence intervals (n=754)

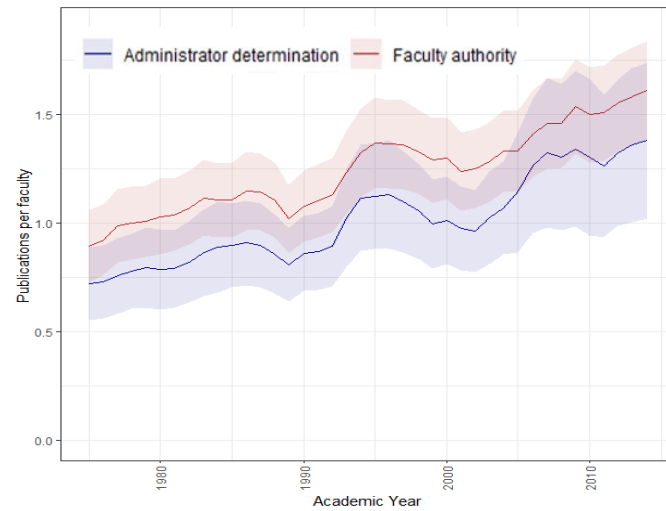


Figure 6.a. Publications per faculty, 1975-2014, by 1970 appointment authority, doctoral university respondents, unbalanced panel; means and 95% confidence intervals (n=136)

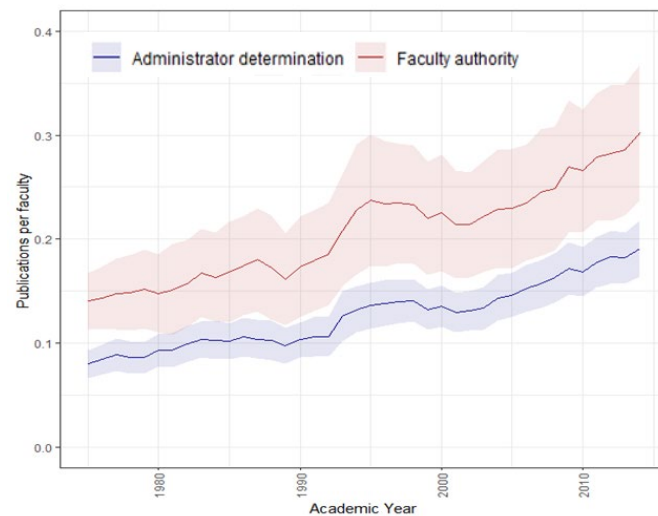


Figure 6.b. Publications per faculty, 1975-2014, by 1970 appointment authority, comprehensive university respondents, unbalanced panel; means and 95% confidence intervals (n=325)

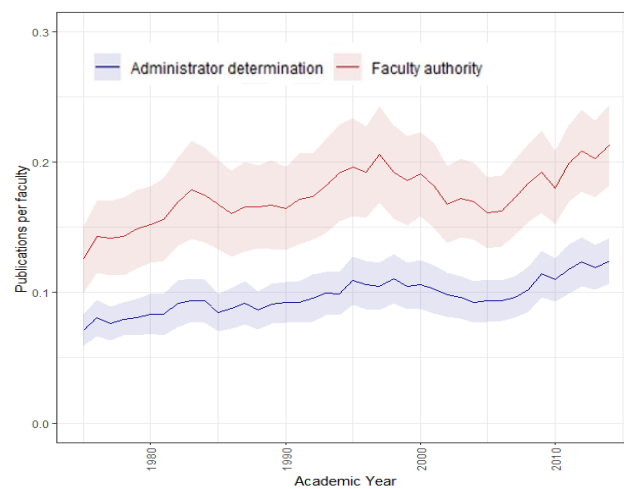


Figure 6.c. Publications per faculty, 1975-2014, by 1970 appointment authority, liberal arts college respondents unbalanced panel;; means and 95% confidence intervals (n=291)

The correlation between faculty authority and publication rates remains after inclusion of various controls. Table 5 presents regression results for linear and tobit specifications of the relationship between publication rates and faculty authority over appointment and tenure decisions controlling for institutional affiliation/control (that is, whether the institution is public, private (secular), Catholic, or other religious affiliation).³⁰ Odd number columns include an interaction term between faculty authority and time (Year), while even number columns include year fixed effects. Publications per faculty are significantly higher on average in institutions with faculty authority in all specifications. In addition, the specifications that include the authority-year interaction (columns (2), (4), (6), and (8)) show publication rates growing at a significantly higher rate over the 1970-2014 period in institutions with faculty authority over either decision. Publications rates were also higher on average at private institutions and lower at institutions with religious affiliations than at public institutions (the omitted category).

Table 6 reports results from estimations including additional controls and alternative specifications to those in table 5. Specifically, column 1 of table 6 mirrors the specification in column 1 of table 5 with the addition of faculty size and founding year as controls. Publication rates are higher at larger and older institutions, but the positive association between faculty appointment authority and both levels and growth in publication rates remains. In recognition of the fact that publication rates are highly skewed, columns (2) through (4) report results of specifications using a log transformation of publications per faculty member as the dependent variable.³¹ The main change of interest is that, in the log specifications, publication growth rates are no longer higher at institutions with faculty appointment authority while the differences in levels remains.

³⁰ Appointment and tenure decisions are the two decision areas common to the 1970 and 2001 AAUP surveys. Table B.1 in the appendix reports results for analogous estimations using authority over the three 1970 decision categories — dismissals, promotions, and reappointments — not covered in the 2001 survey, all of which yield similar results.

³¹ The distribution of publications per faculty member (excluding 7 observations with zero publications) is approximately log normal over the 1975-1984 period. For example, the log of the average number of publications per faculty over 1975-1984 has skewness of -0.04 and kurtosis of 3.5 , compared to 4.60 and 29.8 , respectively, for distribution of variable's actual value. See also figures A.2.3 and A.2.4 in appendix A.2.

Table 5. Publications per faculty 1975-2014, by faculty authority 1970

	Appointments				Tenure			
	linear		tobit		linear		tobit	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Faculty authority	0.225*** (6.833)	0.303*** (7.402)	0.251*** (7.048)	0.323*** (7.579)	0.181*** (5.764)	0.234*** (5.983)	0.200*** (5.874)	0.248*** (6.094)
Year (1975=0)	0.00306*** (7.936)		0.00382*** (9.079)		0.00344*** (8.180)		0.00418*** (9.216)	
Faculty authority * Year	0.00401*** (5.638)		0.00368*** (5.132)		0.00268*** (3.884)		0.00241*** (3.469)	
Private	0.145* (1.879)	0.144* (1.875)	0.144* (1.835)	0.144* (1.833)	0.154** (1.987)	0.155** (1.987)	0.153* (1.928)	0.153* (1.928)
Other religious	-0.235*** (-7.775)	-0.235*** (-7.770)	-0.274*** (-8.440)	-0.274*** (-8.441)	-0.257*** (-8.039)	-0.257*** (-8.035)	-0.295*** (-8.571)	-0.295*** (-8.571)
Catholic	-0.215*** (-5.569)	-0.215*** (-5.570)	-0.232*** (-5.661)	-0.232*** (-5.664)	-0.227*** (-5.665)	-0.228*** (-5.664)	-0.245*** (-5.753)	-0.245*** (-5.755)
Constant	0.209*** (8.403)	0.173*** (6.718)	0.178*** (6.788)	0.141*** (5.151)	0.227*** (8.457)	0.200*** (7.131)	0.199*** (7.047)	0.170*** (5.758)
Observations	31,200	31,200	31,200	31,200	30,890	30,890	30,890	30,890
Number of institutions	783	783	783	783	775	775	775	775
	Wald chi2(6) = 220.54	Wald chi2(43) = 354.86	F(6, 31194) = 38.59	F(43, 31157) = 7.67	Wald chi2(6) = 206.83	Wald chi2(43) = 350.05	F(6, 30884) = 36.39	F(43, 30847) = 7.53
	R ² (between) = 0.1566	R ² (between) = 0.1564			R ² (between) = 0.1294	R ² (between) = 0.1295		
Time fixed effects		Yes		Yes		Yes		Yes

Unbalanced panel; linear random effects (in linear specifications)

Robust z-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Omitted Control category: Public

Table 6. Publications per faculty 1975-2014, by faculty appointment authority 1970

	(1) pubs per fac	(2) ln(.01+pubs per fac)	(3) ln(.01+pubs per fac)	(4) ln(.01+pubs per fac)
Faculty authority	0.160*** (4.717)	0.841*** (9.523)	0.737*** (8.693)	0.690*** (8.287)
Year (1975=0)	0.00252*** (6.448)	0.0147*** (14.16)	0.0141*** (13.10)	0.0129*** (11.37)
Faculty authority * Year	0.00360*** (5.010)	0.000965 (0.696)	0.000474 (0.340)	0.00104 (0.750)
Private	0.146** (2.101)	0.164 (1.330)	0.100 (0.855)	0.165 (1.409)
Other religious	-0.215*** (-4.878)	-0.819*** (-9.307)	-0.867*** (-9.088)	-0.731*** (-6.632)
Catholic	-0.142*** (-3.407)	-0.570*** (-5.087)	-0.487*** (-4.598)	-0.394*** (-3.576)
Faculty size	0.000223*** (2.595)		0.000263*** (3.364)	
ln(Faculty size)				-0.00596*** (-6.654)
Founding year	-0.00266*** (-4.921)		-0.00610*** (-6.532)	0.162*** (3.395)
Constant	5.166*** (5.009)	-2.378*** (-32.98)	9.071*** (5.087)	8.030*** (4.527)
Observations	31,200	31,200	31,200	31,200
Number of institutions	783	783	783	783
	Wald $\chi^2(8) = 269.70$ $R^2(\text{overall}) = 0.3107$	Wald $\chi^2(6) = 852.75$ $R^2(\text{overall}) = 0.2298$	Wald $\chi^2(8) = 1165.81$ $R^2(\text{overall}) = 0.3504$	Wald $\chi^2(8) = 992.78$ $R^2(\text{overall}) = 0.35559$

Linear random effects

Robust z-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Omitted Control category: Public

2001 authority. By 2001, faculty authority over appointment and tenure decisions had become the prevalent governance mode, with faculty exercising authority over decisions in these areas at 70% to 80% of institutions. (See figures 1 and 3). Table 7 reports coefficients from estimations of publications per faculty using the same specifications as in table 5 but relative to faculty authority in 2001. The results are similar but weaker than those using authority in 1970. Faculty authority in 2001 is associated with higher average publication rates but not with higher rates of growth, and R^2 s are lower than in 1970 authority regressions.

5.3. Authority changes and causal relations

The preceding provides compelling evidence of the correlation between faculty personnel authority and publication rates in the later part of the 20th century. Those correlations, of course, tell us nothing about causation. This section looks for insights into causality by (a) examining the relation of publication rates to changes in authority between the 1970 and 2001 surveys, and (b) estimating a marginal treatment effects model that accounts for selection with unobserved heterogeneity.

5.3.a. Changes in authority. Roughly half of the institutions that participated in either the 1970 and 2001 survey participated in both, making it possible to examine how changes in authority relate to publication rates. Table 8 reports cross tabulations of responses for the two personnel decision areas, appointments and tenure, covered by both surveys, where 1 indicates faculty authority and 0 administrator determination. Values in the secondary diagonals (in bold) indicate the number institutions that reported changes in authority at some point between 1970 and 2001. For each decision area, slightly more than half of respondents reported a change in authority: 271 out of 522 responding institutions for appointments, and 263 out of 515 for tenure decisions. The direction of changes were not symmetric, however, with far more institutions bestowing than withdrawing authority from faculty: 237 adding versus 34 withdrawing faculty authority for appointments, and 208 adding versus 55 withdrawing faculty authority for tenure decisions.

Table 7. Publications per faculty 1975-2014, by faculty authority 2001

	Appointments				Tenure			
	linear			tobit	linear			tobit
Faculty authority	0.0608** (2.033)	0.0811** (2.167)	0.106*** (2.767)	0.111*** (2.615)	0.0597* (1.908)	0.0762** (2.036)	0.0860** (2.246)	0.0894** (2.175)
Year (1975=0)	0.00348*** (5.299)		0.00527*** (7.036)		0.00384*** (6.719)		0.00548*** (8.520)	
Faculty authority * Year	0.00103 (1.307)		0.000252 (0.299)		0.000840 (1.125)		0.000171 (0.219)	
Private	0.166* (1.794)	0.208** (2.077)	0.161* (1.680)	0.161* (1.681)	0.208** (2.142)	0.208** (2.142)	0.208** (2.077)	0.208** (2.077)
Other religious	-0.318*** (-9.302)	-0.395*** (-10.04)	-0.405*** (-10.24)	-0.404*** (-10.24)	-0.317*** (-9.208)	-0.317*** (-9.202)	-0.395*** (-10.04)	-0.395*** (-10.04)
Catholic	-0.278*** (-7.496)	-0.308*** (-7.352)	-0.321*** (-7.735)	-0.321*** (-7.736)	-0.273*** (-7.210)	-0.273*** (-7.206)	-0.308*** (-7.352)	-0.308*** (-7.352)
Constant	0.288*** (8.148)	0.230*** (5.711)	0.218*** (5.344)	0.212*** (4.938)	0.290*** (8.378)	0.270*** (7.385)	0.236*** (5.939)	0.230*** (5.711)
Observations	33,939	33,939	33,939	33,939	32,785	32,785	32,785	32,785
Number of institutions	859	859	859	859	828	828	828	828
	Wald $\chi^2(6) =$ 187.43	Wald $\chi^2(43) =$ 349.89	F(6, 33933) = 33.92	F(43, 33896) = 6.57	Wald $\chi^2(6) =$ 189.61	Wald $\chi^2(43) =$ 349.10	F(6, 32779) = 34.70	F(43, 32742) = 6.76
	R ² (between) = 0.089	R ² (between) = 0.097			R ² (between) = 0.101	R ² (between) = 0.101		
Time fixed effects		Yes		Yes		Yes		Yes

Linear random effects (in linear specifications)

Robust z-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Omitted Control category: Public

Table 8. Faculty Authority, 1970, 2001, joint survey responses

	Appointments			Tenure		
	2001			2001		
1970	0	1	Total	0	1	Total
0	73	237	310	81	208	289
1	34	178	212	55	171	226
Total	107	415	522	136	379	515

Notes: 1 indicates faculty authority; 0 indicates administrator authority

Figures 7.a and 7.b depict mean publication rates (in levels in 7.a and logs in 7.b) for institutions that reported administrator determination over appointments in both surveys (0,0) and faculty authority in both surveys (1,1), and those that changed authority, from administrator to faculty (0,1) and from faculty to administrator (1,0). The highest publication rates are associated with institutions at which faculty exercised appointment authority in both 1970 and 2001 (the gold (1,1) line) while institutions that never adopted faculty authority (the blue (0,0) line) had the lowest rates. Mean publication rates at institutions that changed authority in either direction lie in between: Institutions that withdrew faculty appointment authority (the red (1,0) line) had lower average publication rates over the entire period than institutions that retained it, while institutions that bestowed authority on faculty between 1970 and 2001 (the green (0,1) line) produced more research per faculty member on average over the entire period than institutions where appointment authority remained with administrators in both surveys.

Tables 9 and 10 report results of estimations of the relation between publication rates and changes in authority, with and without controls and using linear (table 9) and log (table 10) specifications. The statistical findings regarding authority differences support what is evident from the graphical portrayal. In all specifications and for both decision areas, publication rates are significantly higher for institutions that afforded faculty authority in 1970 than for institutions that exercised administrator determination in both periods (0,0), regardless of whether faculty retained that authority. Although the coefficients are consistently larger for institutions that retained faculty authority in 2001 (that is, for (1,1) versus (1,0)), the difference is only significant in the level specification for appointment decisions in column (2) of table 9.

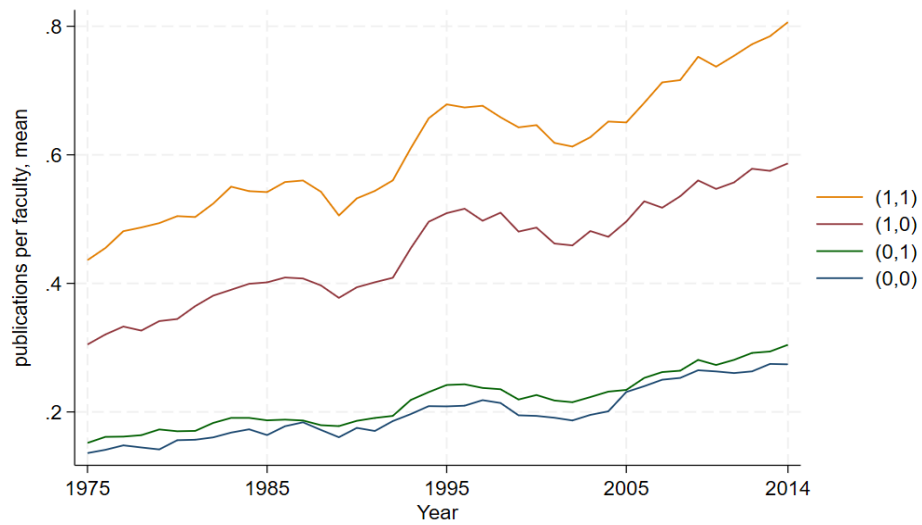


Figure 7.a. Publications per faculty member by faculty appointment authority, (1970, 2001)

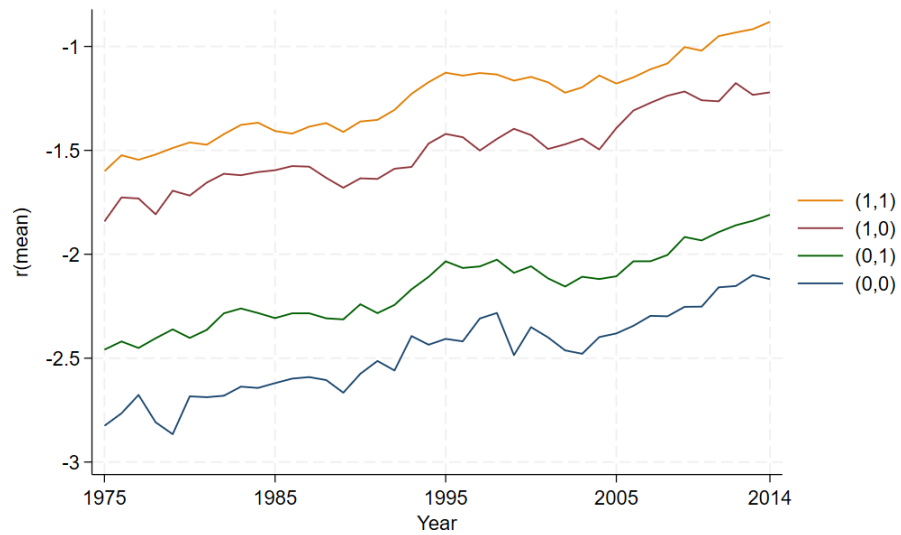


Figure 7.b. $\ln(0.01 + \text{Publications per faculty member})$ by faculty appointment authority, (1970, 2001)

Table 9. Publications per faculty by faculty appointment and tenure authority, 1970, 2001

VARIABLES	Appointment authority		Tenure authority	
	(1) pubs per faculty	(2) pubs per faculty	(3) pubs per faculty	(4) pubs per faculty
Omitted category: (0, 0)				
(0, 1)	0.0202 (0.0548)	0.0345 (0.0528)	0.0142 (0.0466)	0.0266 (0.0526)
(1, 0)	0.253** (0.101)	0.208** (0.0966)	0.260*** (0.0866)	0.243*** (0.0796)
(1, 1)	0.412*** (0.0802)	0.397*** (0.0759)	0.377*** (0.0768)	0.372*** (0.0755)
Private		0.0409 (0.114)		0.0562 (0.116)
Other religious		-0.510*** (0.103)		-0.544*** (0.107)
Catholic		-0.412*** (0.0910)		-0.431*** (0.0924)
Founding year		-0.00322*** (0.000796)		-0.00338*** (0.000816)
ln(Faculty size)		-0.107* (0.0608)		-0.112* (0.0614)
Constant	0.197*** (0.0504)	6.869*** (1.593)	0.207*** (0.0406)	7.217*** (1.653)
Observations	20,810	20,810	20,530	20,530
Number of institutions	522	522	515	515
Wald χ^2 (d.f.)	41.43 (3)	279.7 (47)	36.76 (3)	275.2 (48)
R^2 (between)	0.0952	0.118	0.0797	0.111
Year fixed effects	No	Yes	No	Yes

Random-effects GLS regression

Robust standard errors clustered on institution in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Coefficient equality tests:

Column (1): (1,1) versus (1,0): $X^2(1)$: 2.16; p-value: 0.1416Column (2): (1,1) versus (1,0): $X^2(1)$: 3.20; p-value: 0.0738*Column (3): (1,1) versus (1,0): $X^2(1)$: 1.36; p-value: 0.2442Column (4): (1,1) versus (1,0): $X^2(1)$: 1.85; p-value: 0.1742

Table 10. Log of publications per faculty by faculty appointment and tenure authority, 1970, 2001

VARIABLES	appointment authority		tenure authority	
	(1)	(2)	(3)	(4)
	ln(.01+pubs per fac)	ln(.01+pubs per fac)	ln(.01+pubs per fac)	ln(.01+pubs per fac)
Faculty authority: (1970, 2001)				
Omitted category: (0, 0)				
(0, 1)	0.323** (0.145)	0.260** (0.124)	0.101 (0.141)	0.101 (0.126)
(1, 0)	0.984*** (0.257)	0.603*** (0.209)	0.723*** (0.210)	0.537*** (0.167)
(1, 1)	1.228*** (0.159)	0.883*** (0.135)	0.846*** (0.156)	0.635*** (0.134)
Private		0.231 (0.145)		0.256* (0.145)
Other religious		-0.724*** (0.131)		-0.779*** (0.133)
Catholic		-0.502*** (0.136)		-0.535*** (0.136)
Founding year		-0.00568*** (0.00105)		-0.00604*** (0.00106)
ln(Faculty size)		0.206*** (0.0567)		0.205*** (0.0561)
Constant	-2.486*** (0.129)	7.194*** (2.063)	-2.251*** (0.120)	8.050*** (2.101)
Observations	20,810	20,810	20,530	20,530
Number of institutions	522	522	515	515
Wald X^2 (d.f.)	85.67 (3)	1237 (47)	48.65 (3)	1129 (47)
R^2 (between)	0.15	0.45	0.09	0.43
Year fixed effects	No	Yes	No	Yes

Random-effects GLS regression

Robust standard errors clustered on institution in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Coefficient equality tests:

Column (1): (1,1) versus (1,0): $X^2(1) = 1.03$; p-value: 0.311Column (2): (1,1) versus (1,0): $X^2(1) = 2.22$; p-value: 0.136Column (3): (1,1) versus (1,0): $X^2(1) = 0.38$; p-value: 0.538Column (4): (1,1) versus (1,0): $X^2(1) = 0.46$; p-value: 0.500

Similarly, the coefficients for institutions that introduced faculty authority in 2001 (0,1) are consistently positive, the coefficients are only significant (indicating larger publication rates relative to the omitted category of no faculty authority (0,0)) in the log specification for appointment decisions in columns (1) and (2) of table 10.

5.3.b. Selection and essential heterogeneity. The observed relation between changes in authority and publication rates, although again broadly consistent with a positive association between faculty personnel authority and research, does little to shed light on whether faculty authority contributes to greater research output or whether an institution's research orientation (reflected in publication rates) motivates the delegation of personnel authority to faculty, or both. In this section, I apply the marginal treatment effect framework that generalizes earlier selection models to allow for heterogeneous effects in the presence of selection on unobserved characteristics (see Heckman and Vytlačil, 1999, 2005, 2007). In this context, an institution's assignment of authority over personnel decisions to faculty is the "treatment," and the outcome of interest is publication rates at an institution. Following most closely the notation in Andresen (2019), the structure of the model is

$$Y_j = \mu_j(X) + U_j, \quad j = 0, 1, \quad (2)$$

where the Y_j are potential outcomes — here, publications rates under administrator authority ($j = 0$) and faculty authority ($j = 1$); X is a vector of observable institutional attributes; $\mu_j(X) \equiv E(Y_j|X = x)$; and the U_i are unobserved determinants of publication rates.

Observed outcomes, Y , depend on governance form, G , the selection (or evolution) of which is represented as the outcome of a reduced-form discrete choice process:

$$G = \mathbb{I}[Z\gamma - V] \quad (3)$$

where $\mathbb{I}[\cdot]$ is the indicator function (taking the value of 1 if $Z\gamma \geq V$ and 0 otherwise); Z is composed of the observable attributes, X , and instruments, Z_- ; and V represents unobserved institutional characteristics that influence the discrete choice process. In the present context, $Z\gamma$ can be thought of as reflecting (net) benefits

or advantages associated with faculty authority over personnel decisions and V as unobserved institution-level (net) costs or disadvantages of that authority.³²

Identification strategy. To identify the model, I exploit the fact that personnel decisions are a subset of decisions made within academic institutions. The allocation of authority over each of those decisions is subject to a selection process analogous to that represented by equation (3). Some of the factors influencing that process will be common across decisions while others will likely be specific to particular types of decisions. For example, structural factors such as an institution's control (public versus private) and affiliations (religious versus secular) are likely to affect the costs (or "resistance" to) faculty authority to some degree across all decision types.³³ Similarly, idiosyncratic (typically unobserved) factors such as the attitudes and temperaments of administrators and boards will influence the willingness to delegate decision-making throughout an institution.³⁴ By contrast, decision-making authority may differ across decision areas

³² In the conventional formulation, V "is often interpreted as unobserved resistance to or negative preference for treatment" (Andresen, 2018: 120). But, as Mogstad and Torgovitsky (2018: 581) note, this is only a convention. Accurately described, both V and $Z\gamma$ are reduced-form expressions representing differences in parameters from an underlying structural discrete choice process where the probability of choosing G_1 takes the form $\Pr(G_1=1|Z) = \Pr(P_1 \geq P_0) = \Pr(Z\beta_1 + \varepsilon_1 \geq Z\beta_0 + \varepsilon_0)$, where the P_i are the relevant performance measures associated with the governance alternatives as determined by corresponding $Z\beta_i + \varepsilon_i$. The inequalities in these expressions can be rearranged to yield

$$\Pr[Z(\beta_1 - \beta_0) \geq (\varepsilon_0 - \varepsilon_1)] = \Pr[(\varepsilon_1 - \varepsilon_0) \geq Z(\beta_0 - \beta_1)]$$

The left-hand expression corresponds to the standard MTE formulation of the choice process in which G_1 will be chosen when the (differential) benefits of the observable characteristics on performance of G_1 relative to G_0 are sufficient to overcome "resistance" (" V ") to adopting G_1 , comprised of the unobserved (net) advantages of G_0 . The equivalent right-hand formulation in which G_1 will be chosen when the unobserved (net) advantages of G_1 exceed the costs of disadvantages of G_1 relative to G_0 . The mtefe program in Stata reports results consistent with the conventional formulation.

³³ The establishment of public colleges and universities in the U.S. has been traced to the Supreme Court's 1819 decision in the Dartmouth College case that extended constitutional protection to the independence of private universities from state authority (Goldin and Katz, 1999: 50–52; Masten, 2006: 663). "Faced with a loss of control, legislators understandably questioned the award of public funds to private corporations" (Duryea, 1973: 20).

All three of the AAUP's early statements of principles of academic freedom provided exceptions for "institutions of a denominational or partisan character" (AAUP, 1925). As expressed by the authors of the 1915 statement: "If a church or religious denomination establishes a college to be governed by a board of trustees, with the express understanding that the college will be used as an instrument of propaganda in the interests of the religious faith professed by the church or denomination creating it, the trustees have a right to demand that everything be subordinated to that end." Reflecting perceived changes in the role of religion in higher education, the AAUP officially withdrew this exception for religious institutions in 1970. "Most church-related institutions no longer need or desire the departure from the principle of academic freedom implied in the 1940 'Statement,' and we do not now endorse such a departure" (AAUP, 1970 Interpretive Comments on the 1940 Statement, note 5).

³⁴ See footnote 4 *infra*.

within an institution because of characteristics of the decisions themselves. For instance, observed differences in authority over grade assignments, at one extreme, and long-range budget planning, at the other, will tend to reflect the relative information and expertise advantages of faculty versus administrators in these subject areas (see Masten, 2019: 179, figure 7.1).

Identification here turns on a hypothesized difference between personnel and non-personnel decisions. Specifically, I make the following assumptions (explored below):

1. An institution's unobserved research orientation influences authority over personnel decisions (via the value of faculty authority in addressing hold-up considerations, say, V_R) but is not a determinant of authority over non-personnel decisions.
2. A common set of unobserved factors, V_C , affect an institution's disposition toward (or costs of) faculty authority for both personnel and non-personnel decisions.
3. The common factors, V_C , do not affect publication rates except through the allocation of authority over personnel decisions.

An implication of these assumptions is that observed authority allocations for non-personnel decisions, G_{NP} , will be correlated with unobserved common factors, V_C , but uncorrelated with authority over personnel decisions, G_P , conditional on X . The common factors, V_C , are unobserved, but each institution's allocation of decision authority for over non-personnel decisions is observed, from which a measure of an institution's relative disposition toward autocratic (centralized) governance (resistance to faculty (participatory) governance) can be constructed. A simple such measure is the average of an institution's use of administrator determination across non-personnel decision.³⁵ Table 11 reports descriptive statistics for this index for the 1970 and 2001 survey responses. Because the 2001 survey

³⁵ See Appendix A.1, Masten (2006, 2019), and Kaplan (2002) for a list of decision areas covered by the surveys. Among the areas covered were questions concerning the determination of salary scales and individual salaries. Both surveys classified these decisions under the heading "Financial Planning and Policy" rather than with other personnel decisions under "Faculty Status." Faculty rarely exercised authority over salary-related decisions in 1970 and did so in fewer than 20% of institutions in the 2001 data.

Table 11. Autocratic disposition index, non-personnel decisions¹

	mean	s.d.	min	max	n
1970 survey, 26 decisions	58.63	17.83	3.85	100	780
1970 survey, 13 decisions ²	66.91	17.33	7.69	100	780
2001 survey, 13 decisions	52.75	17.93	0	100	863

¹ Average of administrator determination (percentage) responses for non-personnel decision areas.

² Average of administrator determination (percentage) responses for the 13 non-personnel decision areas in 2001 survey. The correlation between the 26 and 16 decision indices for 1970 is 0.91.

covered fewer decision categories than the 1970 survey (15 versus 31), I calculated the index for 1970 using all 26 non-personnel decisions in the 1970 survey and also just the 13 non-personnel decisions included in the 2001 survey. A higher value of this index indicates that an institution has a relatively greater disposition toward autocratic governance (higher resistance to participatory (faculty) governance) on average.³⁶ Under the relevant assumptions, this average serves as a suitable instrument ($Z_{_}$) for identifying the personnel authority selection process in equation (3).³⁷ A higher index value implies a higher cost of (greater resistance to) faculty authority and therefore $\gamma_{Z_{_}} > 0$.

Instrument validity and first step estimates. Tables 12 and 13 report estimations bearing on the validity of non-personnel authority as an instrument. Column (1) of table 12 reports the coefficients from the probit estimation of 1970 faculty authority, the first step of the two-step marginal treatment effects estimation.³⁸ Non-personnel authority is significant predictor of personnel authority, supporting its use as

³⁶ See Appendix A.1 for histograms showing the distribution of the resulting autocratic index.

³⁷ Andresen (2018: 5-6; 2019) and Mogstad and Torgovitsky (2018) provide summaries of MTE methods and formal statements and discussions of the identification requirements.

³⁸ First-step probit estimates and propensity scores for appointment and tenure authority are virtually identical, differing by just 2 observations.

Table 12. Probit estimates, faculty appointment authority, 1970			
	(1) Faculty appointment authority, 1970	(2) Faculty appointment authority, 1970	(3) Faculty appointment authority, 1970
Autocratic index 1970 (13)	-0.0353*** (0.00399)	-0.0355*** (0.00392)	-0.0355*** (0.00396)
ln(.01+pubs per fac (75-84))		0.228*** (0.0624)	
ln(.01+pubs per fac (05-14))			0.246*** (0.0636)
ln(Faculty size, 1975)	0.588*** (0.0744)	0.393*** (0.0917)	0.362*** (0.0928)
Private	0.511*** (0.162)	0.274 (0.178)	0.265 (0.171)
Other religious	0.251 (0.176)	0.125 (0.181)	0.145 (0.180)
Catholic	0.925*** (0.194)	0.759*** (0.199)	0.772*** (0.197)
Founding year	-0.000718 (0.00130)	7.26e-05 (0.00132)	-0.000140 (0.00133)
Constant	0.161 (2.573)	0.245 (2.597)	0.749 (2.609)
Observations	776	776	774
Pseudo R^2	0.241	0.255	0.257
Wald X^2 (d.f.)	148.2 (6)	172.4 (7)	163.4 (7)

Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

an instrument. Columns (2) and (3) include publications per faculty member averaged over the first and final decades, respectively, of the late-century sample publication data.³⁹ The results in these columns show that non-personnel authority remains a significant predictor of faculty appointment authority even after controlling for publication rates while faculty appointment authority remains positively related to publication rates after controlling for authority over non-personnel decisions.

Table 13 reports of results from regressions of publication per faculty member (again, averaged over the first and last decades of late-century sample publication data) with the inclusion of average non-personnel authority in 1970 as an explanatory variable. Specifically, the dependent variable is the log of

³⁹ To facilitate estimation, I use average publication rates over each of the four decades of publication data in the post-WWII data (1975-1984, 1985-1994, 1995-2004, and 2005-2014) to use as outcome measures. For space reasons, I report results only for the first and last decades here.

Table 13. Relationship between non-personnel authority and (log of) average publications per faculty, 1975-1984, 2005-2014

	1975-1984			2005-2014		
	(1)	(2)	(3)	(4)	(5)	(6)
Autocratic index 1970 (13)	0.00194 (0.00239)	0.000578 (0.00194)	-0.00256 (0.00185)	0.00194 (0.00239)	-0.00261 (0.00182)	0.000423 (0.00189)
Faculty apt. authority, 1970	0.924*** (0.0925)	0.298*** (0.0772)		0.924*** (0.0925)		0.290*** (0.0717)
ln(Faculty size, 1975)		0.811*** (0.0469)	0.864*** (0.0439)		0.947*** (0.0427)	0.894*** (0.0454)
Private		0.962*** (0.114)	1.010*** (0.112)		0.892*** (0.105)	0.847*** (0.107)
Other religious		0.515*** (0.104)	0.537*** (0.104)		0.430*** (0.102)	0.408*** (0.103)
Catholic		0.724*** (0.104)	0.806*** (0.100)		0.650*** (0.0962)	0.570*** (0.100)
Founding year		-0.00338*** (0.000768)	-0.00343*** (0.000775)		-0.00256*** (0.000787)	-0.00250*** (0.000780)
Constant	-2.626*** (0.180)	-0.409 (1.521)	-0.267 (1.528)	-2.626*** (0.180)	-1.946 (1.543)	-2.089 (1.536)
Observations	776	776	776	774	774	774
R ²	0.134	0.497	0.487	0.144	0.553	0.562
F (d.f.)	55.00 (773)	89.91 (768)	92.40 (769)	61.35 (771)	124.7 (767)	115.3 (766)

Dependent variable: Natural log of (0.01 plus) average publications per faculty member for 1975-1984 (columns (1)-(3)) and 2005-2014 (columns (4)-(6))

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

(0.01 plus) the average publication per faculty member from 1975-1984 for columns (1) to (3) and from 2005-2014 in columns (4) and (6).⁴⁰ In all three specifications and both time periods, the autocratic index based on non-personnel authority is statistically unrelated to publication rates regardless of whether faculty authority over appointment decisions and other controls are included. Authority over appointment decisions, on the other hand, continues to have a significant positive relationship to research intensity after inclusion of non-personnel authority. Although not dispositive, the estimates are consistent with assumptions that authority over personnel decisions is related to publication rates but that authority over non-personnel decisions is not.

Second step estimates. Combined, the results reported in tables 12 and 13 offer support for (not proof of the validity of, of course) using non-personnel authority as an instrument, Z_{-} , in the marginal treatment effects framework. Output from estimations of the model for 1970 appointment authority and

⁴⁰ Results for 1985-1994 and 1995-2004 are similar and reported in appendix B.

publications per faculty member over the 1975-1984 and 2005-2014 intervals are reported in figures 8 and 9 and table 14. Figure 8 plots the common support for the estimated probit propensity scores (column (1) of table 12).⁴¹ Figure 9 shows the estimated marginal treatment effects over the “resistance to treatment” U_G (with 95 percent confidence bands). Marginal treatment effects decline at higher levels of resistance to faculty authority, becoming negative for institutions with high level of resistance, indicating positive selection on unobservable benefits of faculty authority with positive MTE for institutions with low resistance (high unobserved benefits) of adopting faculty authority and negative MTE for institutions with high resistance (low unobserved benefits).⁴²

Table 14 reports output using the Stata `mtfe` command. The coefficients in columns (2) and (4) indicate differential effects of age, size, and control on publication rates between institutions with and without faculty appointment authority: Earlier founding and larger size, and private and (for the 2005-14 period) Catholic (relative to public) control, are associated with higher publication rates at institutions with faculty appointment authority relative to those without ($\beta_1 - \beta_0 > 0$). Of more interest and relevance, however, are the results regarding selection and estimated treatment effects. First, the results indicate significant heterogeneity and selection on unobservables. The p-values for tests of heterogeneity indicate the existence of heterogeneity in both observables and unobservable attributes, and the significant Mills ratio coefficient supports the presence of selection on that unobserved heterogeneity.

Second, although governance choice has no effect on average (ATE is indistinguishable from 0), governance choice is estimated to have significant implications controlling for selection. Estimates accounting for unobserved heterogeneity and selection in authority allocations in 1970 indicate that delegation of authority over personnel decisions to faculty increased research productivity among institutions that chose to do so ($ATT > 0$), whereas delegating personnel authority to faculty at institutions

⁴¹ The common support provides a means for checking that the requirement that (here) institutions with the same characteristics have a positive probability of both faculty and administrator authority (are both “participants” and “nonparticipants”) is met.

⁴² The MTE is the estimated mean return to faculty authority for institutions indifferent between delegating and not delegating authority as a function of the unobserved determinants of the value of faculty governance.

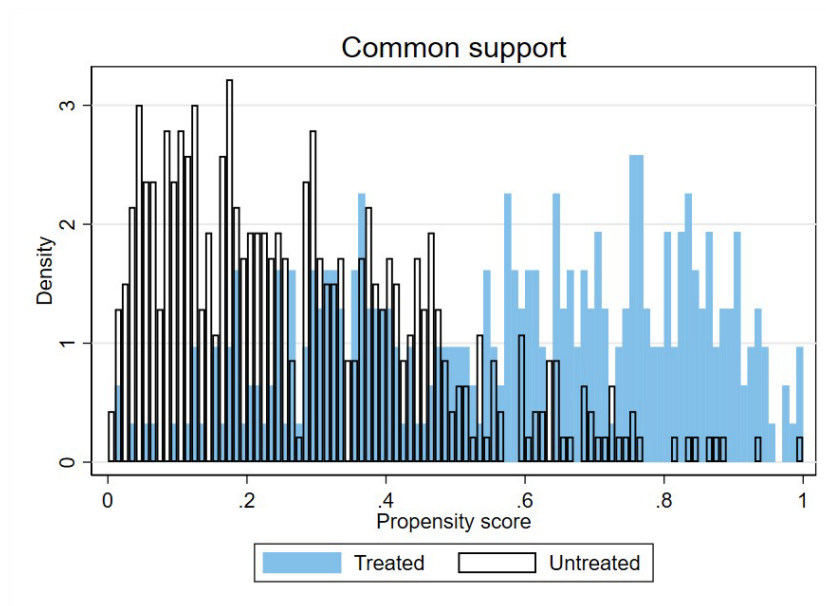
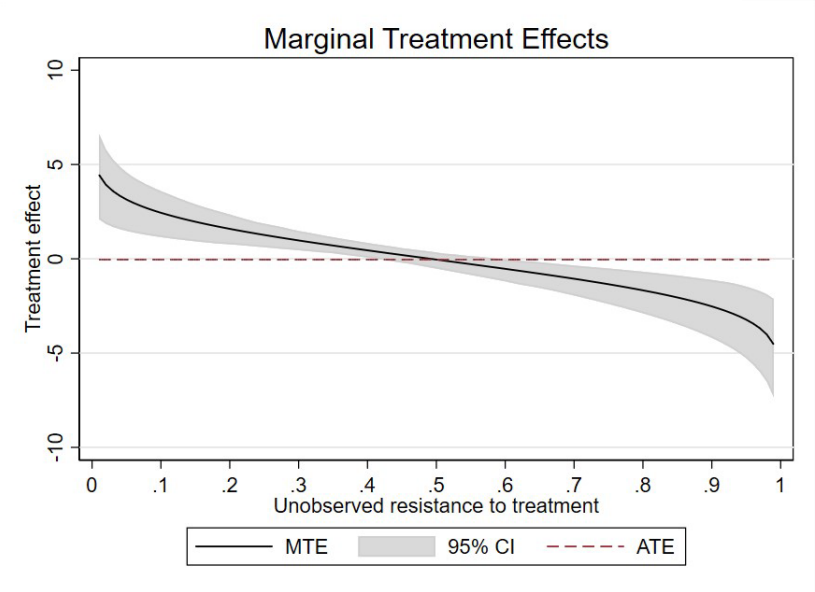


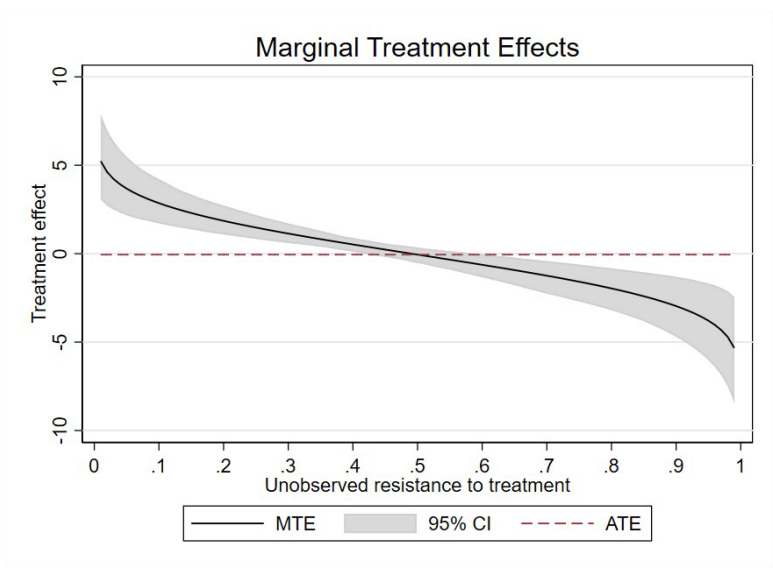
Figure 7. Distribution of probit propensity scores, 1970 appointment authority

Figure 8. Estimated marginal treatment effect curves, faculty appointment authority, 1970

Panel A. 1974-1984



Panel B. 2005-2014



Outcome variable: log of (0.01 plus average publications per faculty member over indicated year range).

Table 14. MTE estimates for 1970 faculty appointment authority				
	ln(.01+ppf(1975-1984))		ln(.01+ppf(2005-2014))	
	(1)	(2)	(3)	(4)
	β_0	$\beta_1 - \beta_0$	β_0	$\beta_1 - \beta_0$
ln(Faculty size, 1975)	0.232** (0.116)	1.230*** (0.234)	0.389*** (0.146)	1.061*** (0.293)
Private	0.237 (0.236)	1.445*** (0.424)	0.229 (0.241)	1.214*** (0.427)
Other religious	0.208 (0.177)	0.445 (0.455)	0.0825 (0.221)	0.550 (0.487)
Catholic	0.494** (0.196)	0.450 (0.399)	0.102 (0.229)	0.948** (0.429)
Founding year	0.000272 (0.00137)	-0.00758*** (0.00274)	0.00270* (0.00159)	-0.0111*** (0.00290)
Constant	-4.742* (2.619)	7.606 (5.279)	-9.763*** (3.024)	15.01*** (5.525)
Inverse Mills ratio	-1.937*** (0.549)		-2.271*** (0.620)	
ATE	-0.0414 (0.220)		-0.0527 (0.235)	
ATT	1.884*** (0.407)		2.049*** (0.476)	
ATUT	-1.328*** (0.474)		-1.448*** (0.532)	
Test of observable heterogeneity	p-value: 0.0000		p-value: 0.0000	
Test of essential heterogeneity	p-value: 0.0004		p-value: 0.0003	
Observations	776		774	

Bootstrap standard errors (250 repetitions) in parentheses; *** p<0.01, ** p<0.05, * p<0.1

where administrators had retained that authority would have reduced research productivity ($ATUT < 0$). Taken at face value, the estimates suggest the existence of substantial costs in terms of lost research productivity of “mistaken organization” with regard to personnel authority allocations as of 1970. On one hand, the commitment advantages of assigning faculty authority over personnel decisions may have allowed research-oriented institutions to attract highly motivated, research-oriented scholars that they could not have without the enhanced security that faculty authority provides, resulting in higher publications rates. On the other, giving faculty authority over personnel decisions at institutions where they did not have it, by enhancing job security, might have, as commonly associated with tenure, reduced incentives to publish.⁴³

2001 governance. Finally, table 15 reports estimated treatment effects for faculty authority over appointment and tenure decisions in 2001. The estimates are notable for the absence of any evidence of heterogeneity, selection, or treatment effects. Although an institution’s disposition toward autocratic governance in non-personnel decisions remains a strong (negative) predictor of faculty authority over appointment and tenure decisions (reported in appendix B), estimated average treatment effects in the MTE framework are not significantly different from zero for either “treated” and “untreated” institutions, and the null hypothesis of homogeneity can no longer be rejected for either observable or essential (unobservable) differences between faculty and administrator authority. The most conspicuous change in governance between 1970 and 2001 was an increase in the proportion of institutions at which faculty exercised authority over at least some appointment and tenure decisions, rising from 41% to 78% for appointments and from 43% to 74% for tenure decisions (among all survey respondents).⁴⁴ Although, as seen above, publication rates remained positively (if more weakly) correlated with faculty authority in 2001, the causal relationships between faculty authority and publication rates apparent in 1970 dissipate by 2001. The findings are consistent with factors other than research productivity — for example, an “ideological” preference for

⁴³ Results using 1970 tenure authority are comparable, as are results using a linear specification of publications per faculty member and those using only observations for institutions that responded to both surveys. See Appendix B.

⁴⁴ The changes among respondents to both surveys were nearly identical: from 41% to 79% for appointments and from 44% to 76% for tenure decision (see table A.1.4 in appendix A).

Table 15. MTE estimates, 2001 faculty authority

	Appointments	Appointments ¹	Tenure
Inverse Mills ratio	-0.161 (0.511)	-0.345 (0.457)	0.0756 (0.595)
ATT	0.533 (0.521)	0.378** (0.188)	0.176 (0.611)
ATUT	0.203 (0.299)	0.0965 (0.252)	0.261 (0.336)
Test of observable heterogeneity, p-value	0.6466	0.5510	0.8905
Test of essential heterogeneity, p-value	0.7533	0.4510	0.8989
Observations	854	845	823

¹ 1% trim

Bootstrap standard errors (250 repetitions) in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Controls: Log of faculty size, Control indicators, Founding year

democratic governance — dominating the allocation of personnel authority, resulting in the addition to the pool of treated institutions sets of institutions for which the treatment effect on research productivity is negative.⁴⁵

6. Conclusion

Why faculty — and only some faculty — should enjoy rights, privileges, and protections available, at least in combination, to virtually no other class of employees has never been adequately explained. To be sure, many rationales have been offered, most raising valid concerns. Academic freedom *is* at risk if administrators can terminate outspoken faculty at will; scholars *will* be less willing to pursue risky lines of inquiry in the absence of employment guarantees; the willingness to identify and support hiring the best candidates for a position likely *would* be chilled when that position may be your own. But none of these are problems unique to higher education. As special as we like to think we are, it has yet to be shown that the severity of these concerns are distinctly greater in academia than in other sectors, or that their severity is

⁴⁵ An analogy would be assignment of a drug treatment that increases lifespan for some patients and decreases it for others based on some as-yet unknown genetic factor. Depending on the size of the effects and distribution of the genetic factor, random treatment assignments could show the treatment to have no effect on the patient pool on average even though the treatment would be effective if the assignment (selection) process could be improved. Here, assignment of faculty authority based on considerations other than its effects on research productivity would similarly pool institutions with positive and negative treatment effects.

sufficient to overcome, and thereby justify, the significant drawbacks associated with the job security and decision rights accompanying a tenured appointment. Why aren't labor market competition, reputation, and standard employment contracting — deemed sufficient protection and recourse for most employees, including the growing number of contingent faculty — also adequate for “regular” faculty?

Tenure and faculty authority over personnel decisions are, at least in the United States, mostly phenomena of the late 20th century. With few exceptions, faculty at the beginning of the century served at the pleasure of autocratic presidents and, later, autocratic department chairs. To be sure, presidents, like managers of any business enterprise, had little incentive to hire and fire professors arbitrarily and were constrained in their treatment of faculty by competition, especially for prominent professors. But faculty throughout the 19th and into the early 20th centuries had little formal say over who their colleagues were and little recourse if the administration decided, for whatever reason, that their services were no longer needed. In other words, at least with respect to personnel decisions, colleges and universities operated much like other employers for much of the 20th century — and as they do now with respect to all but the (dwindling) privileged class of tenured faculty.

This paper suggests a pair of features of academic employment that together introduce the type of hold-up problem conventionally associated with durable, relationship-specific investments even though none of the principle activities that faculty typically perform — teaching, research, and service — is more than incidentally specific to any institution. The source of the problem lies, first, in the way scholars accumulate, and markets value, academic capital — the knowledge and skills that determine an individual's capacity to produce research — the development and maintenance of which requires continuous investments of time and effort. The second is the combination of research and non-research responsibilities expected of “regular” faculty. The absence of either of these features obviates the hold-up problem and accounts for why neither purely instructional faculty nor research scientists without teaching responsibilities typically command the employment guarantees and governance rights of “full service”

faculty.⁴⁶ It also aligns with the historical record in which tenure and associated governance rights emerged and diffused gradually and selectively over a century as research was first introduced and subsequently gained importance as a central function of higher education institutions.

None of this is necessarily a defense of the status quo. Academic democracy exhibits many of the same deficiencies as political democracy but is, in one respect at least, potentially worse: With faculty exercising authority over hiring and promotion decisions, membership in academic communities, unlike general polities, is self-perpetuating. Once a faction achieves a majority, the democratic process for selecting and retaining faculty will naturally tend toward ideological (and frequently methodological and topical) homogeneity. With the addition of the job security afforded by tenure, overturning prevailing interests within current institutional arrangements becomes a very long-term undertaking if possible at all. It may be that significant reforms of higher education are only be achievable through radical restructuring. If the analysis here is correct, however, it may not be possible to eliminate or significantly weaken the prevailing governance arrangements without sacrificing the credibility necessary to sustain the academic bargain that has kept American research universities at the top of higher education for the better part of a century.

⁴⁶ Purely instructional (non-research) faculty are typically hired on annual or relatively short multi-year contracts. Although criteria for appointment and promotion of non-instructional university research scientists are often similar to those for tenure-track faculty, research scientists are typically not eligible for tenure.

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Appendix A. Data definitions, sources, and descriptive statistics

A.1. Governance data

1924 and 1941 AAUP surveys

Respondents: 1924: “The information on which this report is based was obtained by means of questionnaires sent to the institution, addressed as a rule to the President. The proof has been submitted in each case to the President for verification (AAUP, 1924: 307, note 2). *1941:* “organized chapters of the Association” (AAUP, 1940: 171)

A.1.1. Faculty personnel consultation, 1924 survey*			
		Gerber (2014) coding	Recoding
Formal involvement	38	Faculty consultation	53
Significant involvement	15		
No involvement or no clear reply	114	No consultation	114

*Survey question: “To what extent and how do the Faculty members participate in the selection of members of the teaching staff?”

A.1.2. Faculty personnel consultation, 1941 survey*			
		Gerber (2014) coding	Recoding
Elected departmental head	6	Faculty consultation	79
Departmental committee	19		
Faculty committee	38		
Both faculty and department	16		
None	45	No consultation	148
Appointed departmental head only	103		

*Survey question: “Is faculty consulted in appointments, promotions, dismissals? How?”

Source: Electronic data file provided by Professor Larry Gerber

References:

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1970 and 2001 AAUP Surveys

Respondents, 1970, 2001

1970: “For two-thirds of the institutions (542), answers to the survey were supplied jointly by faculty representatives and administrators. Administrators alone supplied responses at 169 institutions and faculty representatives at 45 institutions. Finally, at 70 institutions, separate responses from faculty and administrators were submitted....” (Masten, 2006: 664). For the current study, joint responses were used where available, followed by faculty responses (AAUP or faculty representative); administrator response were used only in the absence of other respondents.

2001: “Letters were sent to campus presidents and AAUP chapter heads. The president was asked to fill out the survey or pass it on to a senior and trusted member of the administration whose views corresponded to the president’s and whose knowledge of governance matched that of the campus CEO. The letter also asked the president to identify a faculty member with seniority and knowledge about governance and to pass along the survey packet and request that faculty representatives fill in their part of the survey” (Kaplan, 2002b: 316). See Kaplan (2002a: 9) for a breakdown of the frequency of responses from administrators, faculty governance representatives, and AAUP chapters.

Table A.1.3. Number of valid responses, AAUP surveys, 1970, 2001

Decision	1970	Survey 2001	Both
1. Appointments	783	859	522
2. Reappointments/renewals	781		
3. Promotions	776		
4. Tenure	775	828	515
5. Dismissals for cause	752		

Table A.1.4. Faculty Authority, percentage and mean, 1970 and 2001 samples

All responses		1970				2001			
	% All	% Some	%Any	Mean		% All	% Some	%Any	Mean
1. Appointments	20.1	19.8	40.9	29.4		51.6	26.8	78.3	69.4
2. Reappointments/renewals	18.4	15.8	34.2	25.4					
3. Promotions	24.5	15.1	39.6	31.4					
4. Tenure	28.5	14.5	43.0	35.1		54.6	19.7	74.3	67.9
5. Dismissals for cause	32.7	8.0	40.7	36.4					
Both survey response institutions		1970				2001			
	% All	% Some	%Any	Mean		% All	% Some	%Any	Mean
1. Appointments	20.7	19.9	40.6	30.0		54.2	25.3	79.5	72.0
4. Tenure	27.8	16.1	43.9	35.1		56.7	16.9	75.6	68.5

“% All” and “% Some” are percentages of valid responses indicating faculty had either exclusive or joint authority over all or some of the corresponding decisions, respectively. “Mean” is the average of the sum of the percentage responses for the “faculty determination” and “joint action” categories in the surveys.

Sources:

1970 survey instrument: American Association of University Professors, 1971. "Report of the Survey Subcommittee T," *AAUP Bulletin*, 57(1), (March): 68-124. (Electronic data file provided by Father James Thornton.)

2001 survey instrument: "2001 Survey on Higher Education Governance" sponsored by The American Association of University Professors & The American Conference of Academic Deans. (Electronic data file provided by Gabriel Kaplan via Professor Stephen Porter)

References:

American Association of University Professors, 1971. "Report of the Survey Subcommittee T," *AAUP Bulletin*, 57(1), (March): 68-124.

Kaplan, Gabriel E., 2002a. "Preliminary Results from the 2001 Survey on Higher Education Governance" [<http://tinyurl.com/Preliminary-Results-2001>]

Kaplan, Gabriel E. 2002. "Between Politics and Markets: The Institutional Allocation of Resources in Higher Education." Unpublished doctoral dissertation, Faculty of Graduate School of Arts and Sciences, Harvard University.

Non-personnel authority index

See Masten (2006, 2019); Kaplan

Non-personnel decision areas (1970) *indicates question also 2001 survey

*Curriculum

*Degree requirements

Academic performance of students

*Types of degrees offered

Establishment of new educational programs

Admission requirements

*Relative staff sizes of disciplines

*Programs for buildings and facilities

President

*Academic deans

*Department chairmen

*Faculty salary scales

*Individual faculty salaries

*Short-range budgetary planning (1–3 years)

Long-range budgetary planning

*Average teaching loads

Teaching assignments

Specification of the organization, duties, and authority of departmental committees and other similar agencies

Membership of departmental committees and similar agencies

*Authority of faculty in government

Specification of the organization, duties and authority of institution-wide committees, senate, and similar agencies

*Membership selection on institution-wide committees, senate, and similar agencies

Academic discipline

Specification student extracurricular rules

Extracurricular behavior

Student role in institutional government

Non-personnel decision areas (2001)

Decisions about the content of the curriculum

Setting degree requirements

Types of degrees offered

Relative sizes of the faculty of various disciplines

Construction programs for buildings and other facilities

Setting of the average teaching loads

Appointing the academic dean

Appointing department chairs or heads

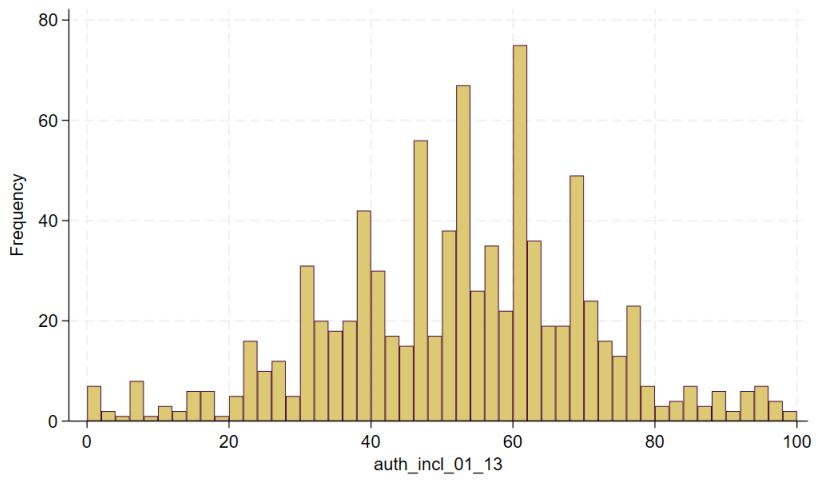
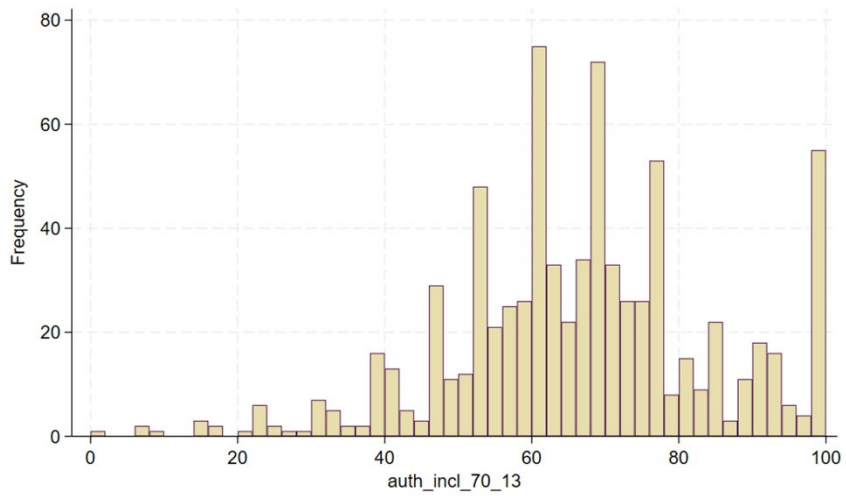
Setting faculty salary scales

Decisions about individual faculty salaries

Short range budgetary planning

Decisions that establish the authority of faculty in campus governance

Selecting members for institution-wide committees, senate, and similar agencies



A.2. Publication counts

Publication data were extracted from the Web of Science Core Collection, comprised principally of the Science Citation Index Expanded (SCIE), the Social Sciences Citation Index (SSCI), and beginning around 1975, the Arts & Humanities Citation Index (AHCI).¹ The Web of Science Core Collection is not comprehensive but instead “includes only journals that demonstrate high levels of editorial rigor and best practice” (<https://mjl.clarivate.com/collection-list-downloads>). Web of Science data files are copyrighted material licensed by and obtained with the assistance of the University of Michigan Library and used with permission.

The Web of Science collections have a number of other limitations and imperfections. See Toutkoushian (2006) and Larsen and von Ins (2010) for discussions of some of the difficulties with and limitations of the Web of Science data. For present purposes, the most important is that, to be included in the count of an institution’s publications, a publication record must identify the affiliation(s) of its author(s).

Because the analysis of governance here takes place at the institution level, only publications for which authors’ affiliations could be identified are included in the totals. Although the current Web of Science database covers publications from 1900 to present, the Indexes did not record institutional affiliations during the period when the Indexes were published exclusively on paper. As a result, institutional affiliations only became available in significant numbers for records beginning around 1973. Institutional affiliations for publications from 1900 to 1944 were recorded, where available, owing to a retrospective project incorporating publications prior to the print publication of the science and social science Indices. The absence of affiliations, especially in earlier years, implies an undercount of publications. A timeline of key events in the history of development of the Indices is on the Clarivate website at <https://clarivate.com/webofsciencegroup/solutions/the-history-of-isi/vatavailable>.

Web of Science records include institutional affiliations for only a fraction of publications. Table A.1 reports the total publications and total articles in the WoS database for a selection of years, followed by counts of the corresponding numbers of records identifying any institutional affiliation and affiliations with U.S. institutions. (Affiliations include government and other non-academic institutions.) As seen in the table, only a fraction records contained institutional affiliations, roughly 10% to 20% in the pre-war data, rising to 40% to 50% in later years.²

Types of documents included varies over time. Articles accounted for over 90% of publications with institutional affiliations over the 1900-1944 period (166,491 out of 178,442) but only two-thirds of such publications between 1973-2014 (14,964,054 of 22,558,262), the largest non-article publication categories being meeting abstracts (13%) and proceeding papers (10%).

¹ Throughout the covered periods, publications in science and technology vastly outnumbered publications in social sciences. Arts and humanities publications (added in the 1970’s) represent a still smaller part of the publication totals, about 7% in 2010, roughly half the number of social science publications reported that year.

² Publication counts with U.S. affiliations are somewhat higher when searches are performed first with country and then affiliation versus affiliation first and then country. For example, for 2000, WoS reports the number of publications as 334,341 for (U.S., affiliation) versus 287,353 for (affiliation, U.S.) out of total publications for 2000 of 1,348,901[as of 3/8/2024]. Values also differ slightly depending on search date.

Table A.2.1. Web of Science Publication Records¹

Year	All records			Records with U.S. affiliation			Sample institutions	
	Total	with institutional affiliation	% with institutional affiliation	with U.S. institutional affiliation	% of total records	% of records with institutional affiliation	in mixed wgt sample	% of records with U.S. institutional affiliation
1900	16,047	2,362	15%	1,017	6%	43%	437	43%
1920	22,950	2,429	11%	2,151	9%	89%	1,488	69%
1940	41,072	8,743	21%	8,127	20%	93%	6,589	81%
1975	566,379	240,974	43%	146,845	26%	61%	131,757	90%
2000	1,348,910	572,033	42%	284,841	21%	50%	244,297	86%
2014	2,858,949	1,171,819	41%	495,454	17%	42%	408,488	82%

¹ values as of June 21, 2023

Data extraction and characteristics

The data used in this study created by first algorithmically and then manually matching institutions in the “governance sample” with institutions in the Web of Science database, an enormous undertaking given alternative spellings, abbreviations, name changes, institutions with the same name, location misattributions, miscoding or misreading errors, among other factors. Consistent with the focus on college and university governance, publications by authors listing affiliations with university hospitals or hospital departments were excluded. (Publications by authors listing medical school affiliations were retained.)

To the extent that publications are co-authored by individuals at more than one institution, a simple summation of publications with any institutional affiliation will overstate the actual number of publications, an issue that becomes more acute over time as co-authorship becomes more prevalent. To address this within the constraints of the Web of Science records, a mixed weighting scheme was adopted that used author weighting where available and institution weighting otherwise, as defined as follows:

1. Author weighting. For entries in which Web of Science records identified the affiliation of each author, each publication associated with an institution was given a weight calculated as (the number of authors affiliated with the institution)/(total number of authors for that publication).
2. Institution weighting. For entries in which individual author affiliations were not recorded, publication counts for each institution were adjusted using an alternative weight calculated as 1/(total number of institutions associated with a given publication).

Figures A.1 and A.2 depict the number of publications with U.S. author affiliations ... contained in the , publications by institutions in the governance sample represent a sizeable portion of all publications by authors with U.S. academic affiliations. The total number of publications associated with sample institutions is 9,537,668 over the combined 1900-1944 and 1973-2014 periods compared to 16,517,582 for all publications by all authors with affiliations with U.S. colleges and universities.

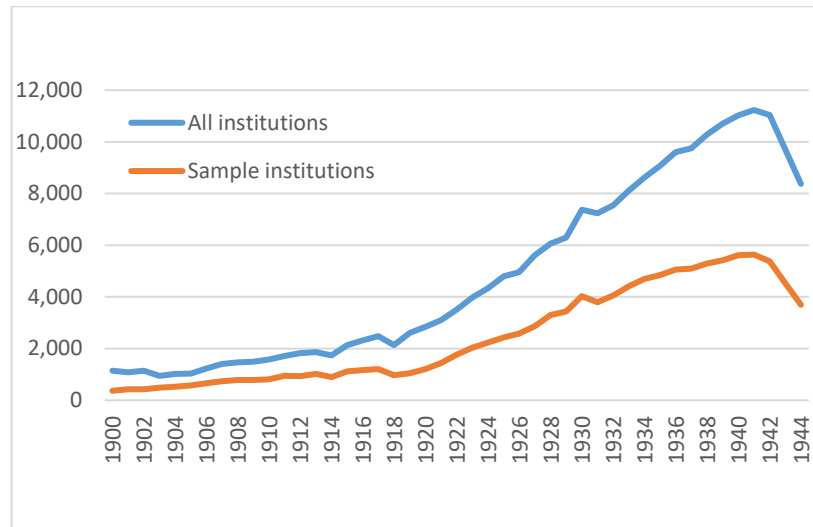


Figure A.2.1. Publications with U.S. affiliated authors, 1900-1944, all and governance sample institutions

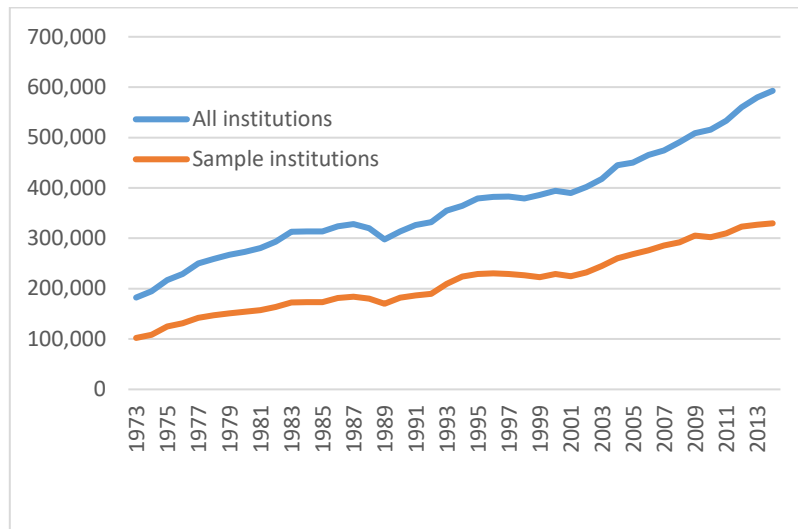


Figure A.2.2. Publications with U.S. affiliated authors, 1973-2014, all and governance sample institutions

Table A.2.2 Descriptive statistics, publications per faculty member, select years

For year	Mean	s.d.	%=0	Max	obs.
1900	0.008	0.031	87%	0.45	411
1910	0.011	0.042	82%	0.56	438
1920	0.012	0.046	79%	0.48	507
1930	0.018	0.065	73%	0.84	641
1940	0.020	0.062	67%	1	903
Average for decade					
1975-1984	0.25	0.54	3%	5.21	1,132
1985-1994	0.28	0.57	2%	5.56	1,137
1995-2004	0.32	0.64	1%	6.04	1,135
2005-2014	0.34	0.66	1%	6.08	1,131

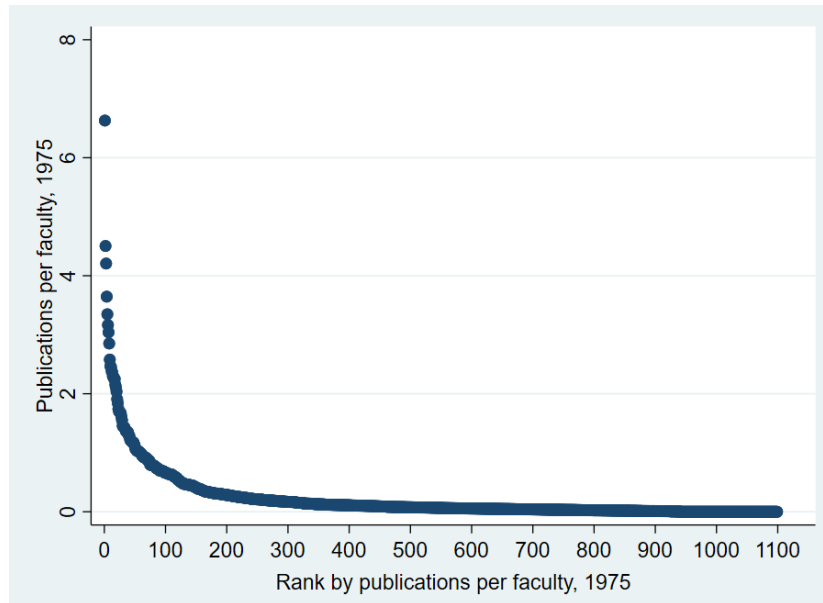


Figure A.2.3. Distribution of publications per faculty, 1975

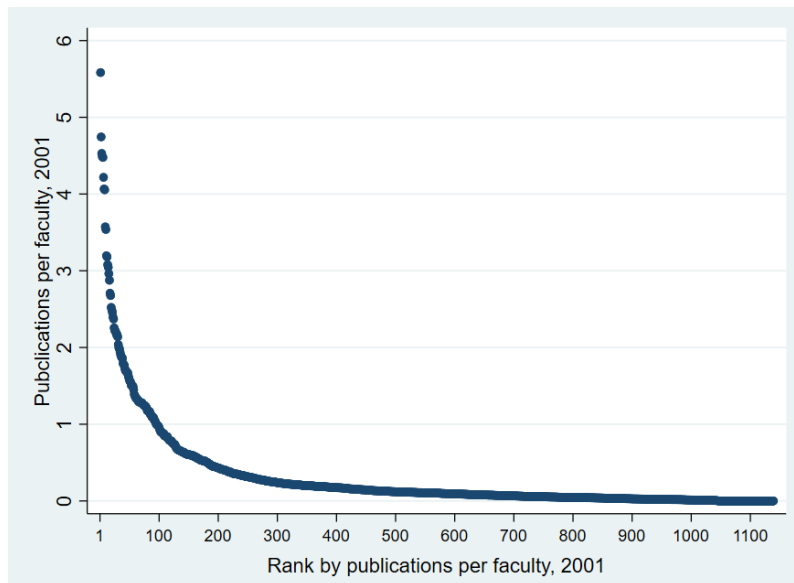


Figure A.2,4. Distribution of publications per faculty, 2001

A.3. Faculty counts

1900-1940

Faculty count data for 1900 to 1940 were manually extracted from U.S. government reports at approximately five-year intervals using the closest available year. (The federal government discontinued publication of data on individual institutions after 1940.) Specific sources are listed below. Faculty counts for intervening years (19*1-19*4 and 19*6-19*9) are interpolated.

1970-2014

The primary source for faculty numbers in the modern period is the National Center for Education Statistics IPEDs database, supplemented by AAUP data, institutional websites, and other ad hoc sources as listed below for years not covered by IPEDs and other missing or inconsistent data.

1970, 1975

Sources: *AAUP Annual Salary Surveys*, and faculty size numbers included in AAUP 1970 survey data. Faculty counts for 1971-1974 and 1976-1979 are interpolated.

1980-2014

Faculty counts beginning with 1980 are for full-time nonmedical instructional staff with academic ranks of professor, associate professor, assistant professor or instructor. IPEDS institutional data are available for specific years beginning with 1980-81. Counts for years 1980-81, 1984-85, 1985-86, 1987-88, 1990-91 through 1999-2000, and 2001-02 through 2003-04 were downloaded from <https://nces.ed.gov/ipeds/datacenter> using the custom data files function. Beginning with the 2004-05 collection year, data for each collection year were compiled into an Access database (IPEDS Access database, annual beginning with 2004-05 through 2014-15.) Faculty numbers for years not covered were interpolated from adjacent years. Faculty counts were interpolated for the following years: 1976-1979, 1981-1983, 1986, 1988, and 2000.

University of California faculty counts

Both U.S. government and AAUP sources prior to 1978 provide faculty numbers only for the University of California system as a whole. Faculty counts for individual campuses from 1900-1940 come from Stadtman (1967). Values for 1975 are imputed from the system-wide AAUP salary survey total for 1975 apportioned based on relative faculty sizes in the 1978 AAUP salary survey.

References

American Association of University Professors Annual Salary Surveys, 1969-2014.

Stadtman, Verne A. (1967). *The Centennial Record of the University of California*. Berkeley: University of California Printing Department.

U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics.

U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS).

U.S. Office of Education. Report of the Commissioner of Education. 1900/01:v.2. Washington: U.S. Govt. Print. Off [1900]

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U.S. Office of Education. Report of the Commissioner of Education. 1904:v.2.

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U.S. Office of Education. Report of the Commissioner of Education 1910

U.S. Office of Education. Report of the Commissioner of Education. v.2 1910/11. [for 1910]

U.S. Office of Education. Report of the Commissioner of Education. Washington: U.S. Govt. Printing Office, 1916/1917. 1917: v.2. [academic year 1915-16]

U.S. Bureau of Education. Biennial Survey of Education 1916-1918, v.3, Washington, D.C: Department of the Interior, Bureau of Education [academic year 1917-18]

U.S. Bureau of Education. Biennial Survey of Education, 1918-20, Washington, D.C: Department of the Interior, Bureau of Education [academic year 1919-1920]

U.S. Bureau of Education. Biennial Survey of Education, 1920-1922, Washington, D.C: Department of the Interior, Bureau of Education [academic year 1921-1922]

U.S. Bureau of Education. Biennial Survey of Education. 1924-1926. Washington, D.C: Department of the Interior, Bureau of Education [for 1925]

U.S. Bureau of Education. Biennial Survey of Education, 1925-1926, Washington, D.C: Department of the Interior, Bureau of Education [academic year 1925-1926]

U.S. Bureau of Education. Biennial Survey of Education 1929-30, v.2, Washington, D.C: Department of the Interior, Bureau of Education

U.S. Bureau of Education. Biennial Survey of Education, 1930-1932, Washington, D.C: Department of the Interior, Bureau of Education [academic year 1931-32]

U.S. Bureau of Education. Biennial Survey of Education, 1934-1936, Washington, D.C: Department of the Interior, Bureau of Education [academic year 1935-36]

U.S. Bureau of Education. Biennial Survey of Education, 1938-40, Washington, D.C: Department of the Interior, Bureau of Education [academic year 1939-40]

A.4. Institutional characteristics

Institutional classifications

1970: Carnegie Commission on Higher Education (1973). *A Classification of Institutions of Higher Education*. Berkeley, CA.

2000: Carnegie Foundation for the Advancement of Teaching. *The Carnegie Classification of Institutions of Higher Education, 2000 Edition*. (Electronic data file, available at https://carnegieclassifications.acenet.edu/wp-content/uploads/2023/03/2000_edition_data.xlsx)

Institutional control and affiliations

1970: American Association of University Professors, AAUP 1970 Survey Data. (“The number of faculty reported or estimated.”)

2000: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), 2000, Institutional characteristics.

Notes

Changes in public and private control are infrequent but do occur. Among sample institutions, three private institutions became public after 1970 (University of Baltimore, Lincoln University (PA), and College of Charleston). Rutgers University became public in 1945.

Religious affiliations are often ambiguous. The vast majority of colleges founded in or before the 19th century had religious affiliations. Duke University, for example, had an affiliation with the Methodist Church that dates back to its founding in 1838. Although long regarded as “an independent and non-sectarian institution,” Duke University was classified in the IPEDS system as late as 2001 as an institution with a religious affiliation, and 24 of the university’s 36 member board of trustees were elected by North Carolina’s Methodist Conferences until 2016. Among the sample institutions, 33 institutions with religious affiliations in 1970 had changed control by 2000: 7 Catholic institutions became private, 24 with Protestant affiliations were reclassified as private, and 2 (Athens State College and Texas A & M University-Corpus Christi) became public. (Only three of the “other religious institutions” among the governance sample institutions were affiliated with Judaism.)

Founding years

Sources

U.S. Bureau of Education. *Biennial Survey of Education, 1925-1926*, Washington, D.C: Department of the Interior, Bureau of Education.

Brenner, Morgan G., 2003. *The Encyclopedia of College & University Name Histories*, Lanham, MD: Scarecrow Press.

Miscellaneous online resources

Appendix B. Additional estimations and results

Table B.1. Publications per faculty 1975-2014, by faculty authority 1970

	(1)	(3)	(3)	(4)	(5)
	Dismissals	Promotions	Reappoint/Renewals	Appointments	Tenure
Faculty authority	0.164*** (4.992)	0.202*** (5.935)	0.164*** (4.992)	0.246*** (5.726)	0.239*** (5.798)
Year (1975=0)	0.00389*** (8.693)	0.00364*** (8.708)	0.00389*** (8.693)	0.00343*** (6.658)	0.00347*** (6.506)
Faculty authority * Year	0.00190*** (2.735)	0.00265*** (3.732)	0.00190*** (2.735)	0.00433*** (4.676)	0.00394*** (4.305)
Private	0.125 (1.636)	0.165** (2.105)	0.125 (1.636)	0.215* (1.907)	0.232** (2.064)
Other religious	-0.267*** (-8.192)	-0.249*** (-7.794)	-0.267*** (-8.192)	-0.281*** (-7.760)	-0.303*** (-7.994)
Catholic	-0.249*** (-6.271)	-0.247*** (-6.026)	-0.249*** (-6.271)	-0.274*** (-5.861)	-0.290*** (-5.876)
Constant	0.240*** (8.795)	0.226*** (8.335)	0.240*** (8.795)	0.240*** (7.428)	0.243*** (7.612)
Observations	29,960	30,939	31,130	20,810	20,530
Number of institutions	752	776	781	522	515
	Wald $\chi^2(6) =$ 210.82	Wald $\chi^2(6) =$ 210.36	Wald $\chi^2(6) =$ 210.82	Wald $\chi^2(6) =$ 165.09	Wald $\chi^2(6) =$ 158.60
	R ² (between) = 0.116	R ² (between) = 0.137	R ² (between) = 0.116	R ² (between) = 0.182	R ² (between) = 0.180

Linear random effects

Robust z-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Omitted Control category: Public

Columns (1) – (3) report results from estimations using the specifications in columns (1) and (5) of table 3 for the three decision categories not covered by the 2001 survey. Results reported in columns (4) and (5) reproduce the estimations in (1) and (5) of table 3 using only responses for the subset of institutions that participated in both the 1970 and 2001 surveys.

Table B.2. Estimated relationship of non-personnel authority and publications per faculty

	(1)	(2)
	ln(1 + avg. pubs per faculty 1975-84)	ln(1 + avg. pubs per faculty 1975-84)
Authority, non-personnel, 1970	0.000395 (0.000377)	-0.000263 (0.000416)
Authority, personnel 1970		0.000614*** (0.000208)
ln(Faculty size, 1975)	0.170*** (0.0113)	0.163*** (0.0111)
Private	0.204*** (0.0321)	0.196*** (0.0319)
Other religious	0.105*** (0.0208)	0.101*** (0.0209)
Catholic	0.138*** (0.0203)	0.124*** (0.0207)
Founding year	-0.000877*** (0.000201)	-0.000869*** (0.000198)
Constant	0.889** (0.393)	0.916** (0.389)
Observations	782	782
R^2	0.436	0.443
F	F(6, 775) = 50.71	F(6, 774) = 44.79
Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1		

These regressions explore the relationship of non-personnel authority and publications per faculty member. Non-personnel authority is statistically unrelated to publication rates with and without inclusion of authority over appointment decisions whereas authority over appointment decisions continues to have a significant positive relationship to research intensity after inclusion of non-personnel authority.

B.3. Probit estimates of 1970 faculty appointment authority

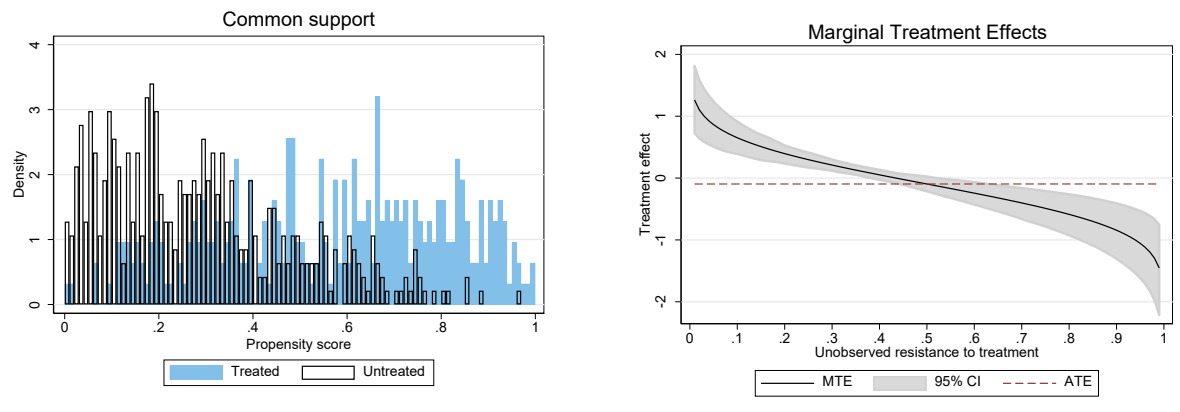
	(1)	(2)
Authority, non-personnel	0.0331*** (0.00343)	0.0328*** (0.00341)
log(1+pubs per fac, 1975-84)		0.769** (0.301)
log(faculty size, 1975)	0.616*** (0.0752)	0.488*** (0.0897)
Private	0.463*** (0.162)	0.310* (0.174)
Other religious	0.200 (0.178)	0.122 (0.180)
Catholic	0.951*** (0.194)	0.848*** (0.197)
Founding year	-0.000233 (0.00131)	0.000301 (0.00133)
Constant	-4.602* (2.630)	-5.028* (2.649)
Observations	782	782
Pseudo R ²	0.233	0.240
	$\chi^2(6) = 163.9$	$\chi^2(7) = 172.5$

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Column (1) reports the coefficients from the first-step probit estimation of 1970 faculty authority from the two-step marginal treatment effects estimation. Column (2) re-estimates that relationship including average publications per faculty member between 1975 and 1984 (in log form). The probability that faculty have appointment authority is significantly positively related to authority over other decisions. The significant coefficient on publications per faculty in column (2) indicates that faculty appointment authority is positively related to publication rates after controlling for authority over non-personnel decisions.

Figure B.1. Probit propensity score distribution densities, and estimated marginal treatment effect curves

Panel A: Dependent variable: log of (one plus) average publications per faculty member, 1975-1984:



Panel B. Dependent variable: log of (one plus) average publications per faculty member, 2005-2014:

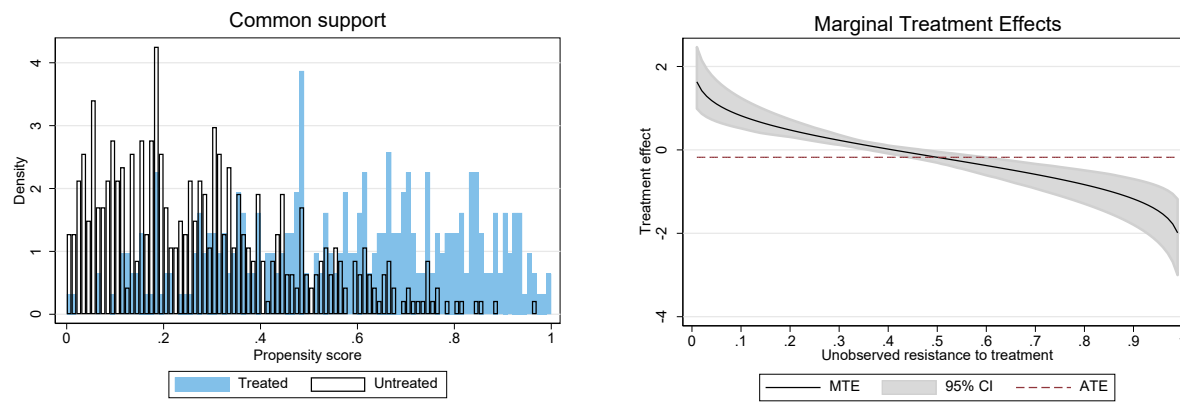


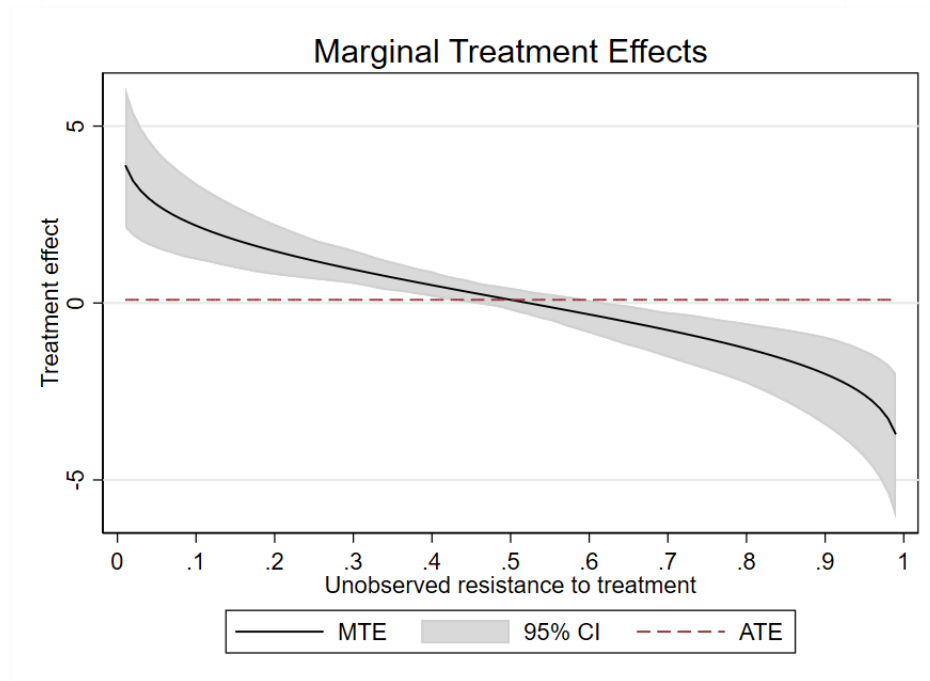
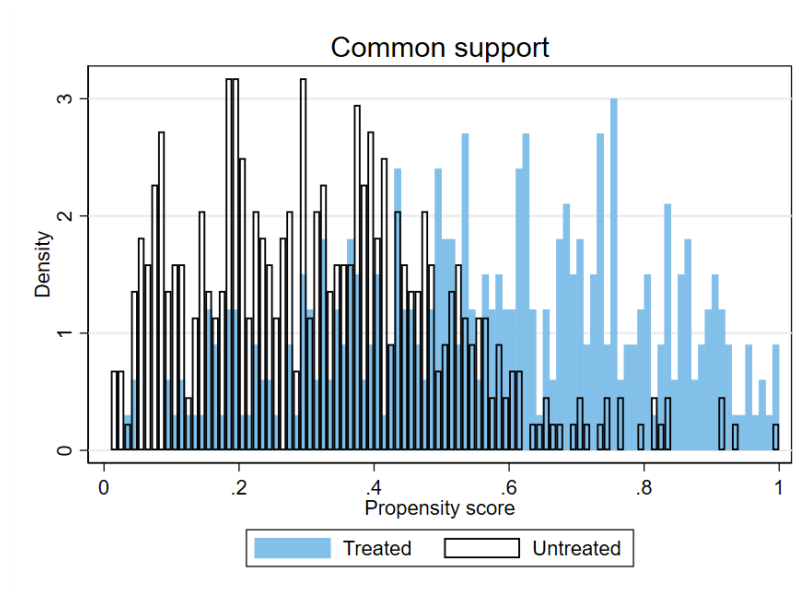
Table B.4. Second-step estimates of essential heterogeneity model

	log(1+pubs per faculty) (1975-1984 avg.)		log(1+pubs per faculty) (2005-2014 avg.)	
	(1)	(2)	(3)	(4)
	β_0	$\beta_1 - \beta_0$	β_0	$\beta_1 - \beta_0$
ln(Faculty size, 1975)	-0.0407* (0.0245)	0.449*** (0.0591)	-0.0131 (0.0300)	0.513*** (0.0763)
Private	-0.0519 (0.0563)	0.530*** (0.132)	-0.0134 (0.0589)	0.485*** (0.136)
Other religious	-0.0165 (0.0307)	0.196** (0.0891)	-0.00863 (0.0369)	0.195* (0.111)
Catholic	-0.0150 (0.0360)	0.302*** (0.0965)	-0.0430 (0.0388)	0.385*** (0.104)
Founding year	0.000604** (0.000277)	-0.00307*** (0.000786)	0.000931*** (0.000312)	-0.00408*** (0.000794)
Constant	-0.945* (0.538)	3.233** (1.505)	-1.682*** (0.612)	4.731*** (1.570)
Mills ratio	-0.584*** (0.139)		-0.778*** (0.169)	
Effects				
ATE	-0.0950 (0.0619)		-0.178** (0.0729)	
ATT	0.525*** (0.0881)		0.614*** (0.114)	
ATUT	-0.510*** (0.132)		-0.705*** (0.162)	
Test of observable heterogeneity, p-value	0.0000		0.0000	
Test of essential heterogeneity, p-value	0.0000		0.0000	
Observations	782		780	

Bootstrap standard errors in parentheses; 250 replications; *** p<0.01, ** p<0.05, * p<0.1

MTE estimation, ln (0.01+average publications per faculty, 1975-1984), by 1970 faculty tenure authority		
VARIABLES	(1) β_0	(2) $\beta_1 - \beta_0$
ln(Faculty size, 1975)	0.464*** (0.117)	0.788*** (0.225)
Private	0.366 (0.292)	1.258** (0.506)
Other religious	0.423* (0.224)	0.111 (0.505)
Catholic	0.797*** (0.234)	0.0284 (0.454)
Founding year	0.000457 (0.00182)	-0.00765** (0.00363)
Constant	-6.252* (3.477)	10.26 (6.863)
Inverse Mills ratio	-1.635*** (0.444)	
ATE	0.0911 (0.168)	
ATT	1.464*** (0.376)	
ATUT	-0.951*** (0.355)	
Test of observable heterogeneity	p-value: 0.0000	
Test of essential heterogeneity	p-value: 0.0004	
Observations	774	
Bootstrap standard errors (250 repetitions) errors in parentheses; *** p<0.01, ** p<0.05, * p<0.		

MTE estimation, $\ln(0.01 + \text{average publications per faculty, 1975-1984})$, by 1970 faculty tenure authority

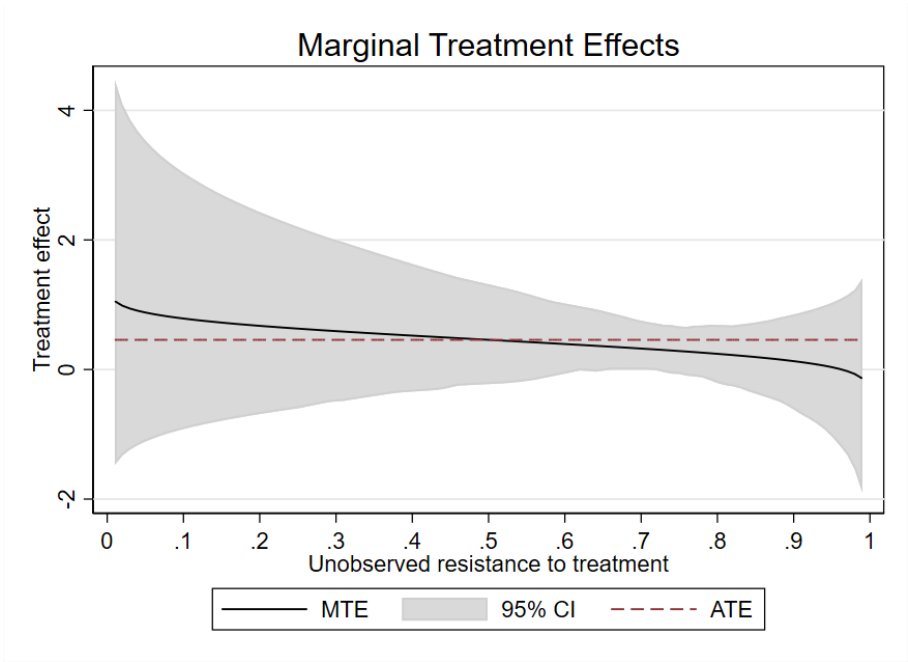
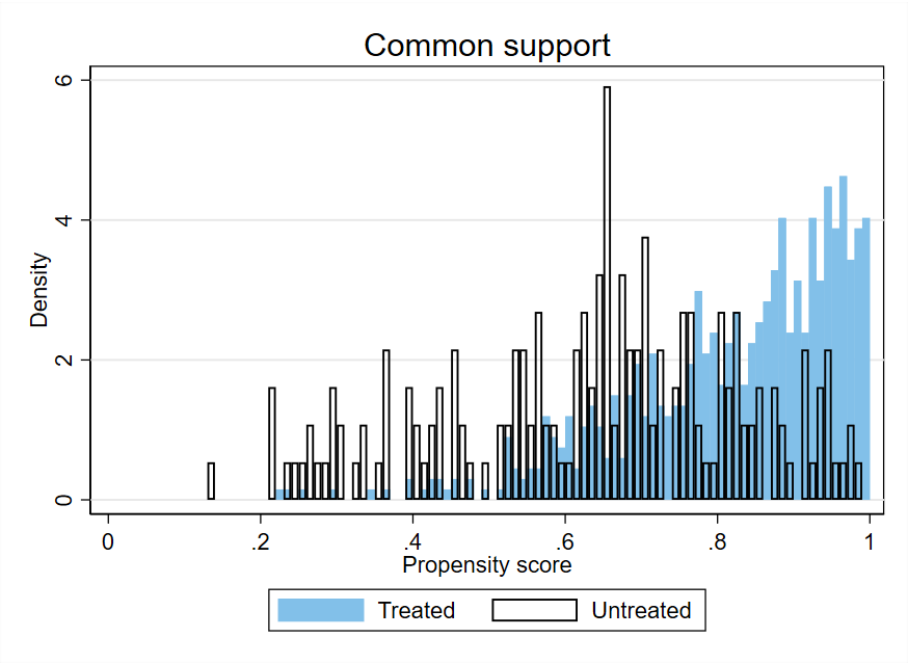


mtefe first step ppf_05-14 on Qfac01_1

VARIABLES	(1) Qfac01_1_bin
2001 Authority, non-personnel	0.0367*** (0.00380)
ln(Faculty size, 2000)	0.181*** (0.0678)
Private	0.285* (0.169)
Other religious	0.208 (0.166)
Catholic	0.182 (0.181)
Founding year	0.00228* (0.00121)
Constant	-6.161** (2.476)
Observations	856
R^2	0.173
χ^2 (df: 6)	109.4

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

mtefe second step ppf_05-14 on Qfac01_1



mtefe second step ppf_05-14 on Qfac01_1

VARIABLES	(1) beta0	(2) beta1-beta0
ln(Faculty size, 2000)	0.647*** (0.211)	0.405 (0.256)
Private	0.352 (0.532)	0.307 (0.637)
Other religious	-0.0471 (0.448)	0.111 (0.554)
Catholic	0.362 (0.413)	-0.202 (0.502)
Founding year	-0.00483 (0.00341)	0.00348 (0.00434)
Constant	3.309 (6.606)	-8.239 (8.427)
Inverse Mills ratio	-0.257 (0.516)	
ATE	0.458 (0.375)	
ATT	0.563 (0.520)	
ATUT	0.0842 (0.321)	
Test of observable heterogeneity	0.3752	
Test of essential heterogeneity	0.6193	
Observations	856	

Bootstrap standard errors (250 repetitions) errors in parentheses; *** p<0.01, ** p<0.05, * p<0.