

# Academic Workforce Flexibility and Strategic Outcomes in Four-Year Colleges and Universities

## Abstract

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Using data for a recent 12-year period, this report explores the connections between faculty workforce composition and institutions' strategic success. The analysis focused upon 1) examination of the most recent empirical evidence on trends in contingent faculty hiring; 2) quantitative analysis using institutional panel data (from IPEDS and the Delta Cost Project) of relationships over time between shifting contingent levels and shifting levels on varied outcomes, employing controls for institutional type/sector, control, size, finances, and other characteristics; and 3) interviews with a small sample of institutional leaders and observers regarding the connection between workplace flexibility and strategic outcomes in their institutions. "Contingent" faculty are nontenure track (NTT), working either part- or full-time on fixed-term contracts. Outcomes examined in the context of an array of statistical controls include freshmen enrollment, student applications, admission yield, student-faculty ratios, six-year graduation rates, and net revenues. Although our models do not provide uniformly positive institutional outcomes from NTT commitments, the majority of the effects were in favorable directions for institutions. Most strikingly, increased NTT commitments were consistently associated with lower student-faculty ratios, suggesting some educational benefits. Ultimately, the efficiency and effectiveness of committing to NTT faculties must be assessed comprehensively and in an integrated fashion, examining marketplace positioning, financing, and academic outcomes holistically.

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In the 1950s, almost all faculty in U.S. higher education were employed full-time and either tenured or on a path toward a tenuring decision. Since then, colleges and universities have dramatically reduced their reliance on this traditional staffing approach. Between 1979 and 2013, the number of postsecondary institutions grew 51 percent, and the number of enrolled students grew 78 percent, but the proportion of all faculty either tenured or on tenure tracks declined from 57 percent to 28 percent, and the proportion of all faculty employed full-time declined from 70 percent to 48 percent (Finkelstein, et al. 2016, Figure 3.2., p. 59).<sup>1</sup> Conversely, the proportions of academic staff employed either on part-time contracts or as graduate teaching assistants grew to well over one half (*ibid.*).<sup>2</sup> Together, these trends suggest a remarkable dilution of the academic workforce—no longer can faculty be assumed to be in the course of well-established career paths. Instead, individuals more tenuously connected to their employing institutions are increasingly conducting the core activities of colleges and universities.

This trend may be characterized as a move toward a more “contingent” faculty workforce.<sup>3</sup> That is, institutions increasingly are staffed by either part- or full-time workers who are on fixed-term contracts without the protections or prospects of tenure.

Externally imposed political factors have helped fuel this disruption. In particular, state policymakers concerned about the productivity and teaching commitments of predominantly tenured public university faculties have worked to tie institutional funding more closely to perceived workforce and economic needs rather than to the liberal-arts disciplines in which tenure-line faculty traditionally predominate (Anderson, 2011; Wong, 2015). Thus, policymakers can create external incentives for shifts toward faculty contingency. States’ increasing commitments to performance-based funding systems

is a prime example: By tying state allocations tightly to such factors as graduation volume and job placements, those funding policies can incentivize institutions toward ramping up enrollments in high-demand fields not well represented among tenured faculty ranks (Sparks and Waits, 2011; Hearn, 2015). These external pressures for accountability can drive institutions toward contingent hiring.

Still, the roots of the trend to workforce contingency lie deeper than politics and spread well beyond the public-sector schools’ dependence on state legislators. For decades, the higher-education management and leadership literature has acknowledged that the heavily tenured workforces of most nonprofit institutions constrain their ability to respond nimbly to emerging market conditions. Many authors within that literature (e.g., Christensen and Eyring, 2011) extend the argument to suggest that commitments to tenure may well lead to outright academic and financial decline and failure in colleges and universities. Not only are schools with predominantly tenured faculty forced to maintain commitments to curricula that may be poorly attuned to emerging market conditions, they also can be tied down by heavy salary commitments to senior faculty and slowed by shared-governance norms associated with traditional academic systems. As Brewer and Tierney (2011, pp. 31-32) put it:

The point is not only that such contractual obligations can retard innovation, but also that the environmental and historical contexts in which institutions reside largely determine whether an institution’s actors embrace or reject innovation and change. In higher education, progress toward organizational change has been muted partly because the traditions of faculty governance lead to deliberative, drawn-out change, driven by those who see little value in it.

<sup>1</sup> Calculations exclude graduate students employed in teaching classes.

<sup>2</sup> As Bowen and Tobin (2015) have noted, there are no precise data on exact percentage changes in faculty employment, because of limitations in survey and reporting protocols. For that reason, we provide general estimates here based on the best sources currently available.

<sup>3</sup> The term “contingent” is used to suggest the same characteristics as those being covered by terms like “secondary labor,” “externalized labor,” “flexible workforce,” and “dual-labor-markets” in a variety of social-science literatures (e.g., see Rebitzer and Taylor, 1991; Kalleberg, Restin, & Hudson, 2000).

The writings of former college leaders echo this argument, almost always highlighting faculty's resistance to change and their ability through traditional governance processes and cultural traditions to thwart potentially enriching institutional initiatives. Taking a more neutral, analytic tone, former University of California President Clark Kerr, an astute university observer, noted correctly that established faculty are not always negative toward change, but rarely are they instigators or champions:

Faculty members are properly partners in the enterprise with areas reserved for their exclusive control. Yet when change comes it is rarely at the instigation of this group of partners as a collective body. The group is more likely to accept or reject or comment, than to devise and propose (Kerr, 2001, p. 75).

Traditionally employed faculty can restrain change in other ways, as well. They represent sizable financial as well as programmatic commitments for institutions. That is, tenured faculty tend to be more highly paid than others, and outside of superstars, they tend to remain in place at their institution. Usually, only outright malfeasance or misfeasance can dislodge a tenured faculty member.<sup>4</sup> Thus, in an institution with a predominantly tenured faculty workforce, disciplinary distributions in a given year may be largely still in place a decade or two later, regardless of any shifts over those years in labor markets and student demand. This stasis can frustrate campus leaders with ambitions of taking their institutions toward significant strategic change.

Framing the move toward contingency in this way places it squarely within the classic strategic management and planning literature in business, the military, higher education, and other contexts. That literature emphasizes the importance of organizations identifying their core values and goals, assessing the external threats and opportunities they face, and examining their own internal strengths and weaknesses (Hearn, 1988; Dyson, 2004). Ideally, such work helps move

organizations toward a refined vision and possible new configurations and new actions. In this frame, institutions' moves toward contingency can be viewed as strategic choices, rather than merely reactive responses to political and financial pressures. Pursuing internal labor force flexibility may give college leaders greater ability to respond to the constraints of programmatic inflexibility in the face of changing student markets and political demands.

There are counterarguments to the strategic rationale for contingency. Whether part- or full-time, and whether formalized as long- or short-term, contingent working arrangements present risks as well as benefits. In areas outside of higher education, observers note that what is gained in employer flexibility and efficiency can be offset by less favorable working conditions, reduced worker security, and turnover challenges for workers and employers alike (Fisher and Connelly, 2017; U.S. Department of Labor, 2017). In higher education, these trade-offs may be made all the more complex by the sector's distinctive employment and governance traditions. Turning over sizable portions of academic work to professionals with limited commitments to the organization and limited voices in educational policy decisions ultimately may harm institutions' educational quality (Ehrenberg and Zhang, 2005; Umbach, 2007; Bowen and Tobin, 2015) and perhaps even their financial and marketplace positions.

In this analysis, we aim to investigate the strategic payoff of the move toward contingency from a broad organizational perspective rather than from a purely academic standpoint. Research in for-profit, noneducational settings provides credible evidence that such moves can pay off in lowered costs and perhaps improved profitability and market position (e.g., see Nayar et al., 2001), especially when arrangements provide promise of longer-term employment for incumbents (Fisher and Connelly, 2017). However, there is no solid evidence on the wisdom of taking a similar path in colleges and universities.

<sup>4</sup> Despite initial hopes, there is little evidence of successful institutional efforts to install "post-tenure review" as a powerful measure to ensure faculty quality (O'Meara, 2004).

The existing higher-education evidence focuses mainly on contingency's implications for proximal outcomes such as faculty satisfaction; gender equity in the academic workforce; and student learning, rather than on more distal, longer-term institutional outcomes. The proximal outcomes are certainly critical, but so too are the broader implications of the contingency movement for institutional survival and health. In that domain, unfortunately, the literature too often relies on anecdotes and data-free speculation. There is a strong need for further empirical work.

## The contingency literature

The higher-education literature presents two strikingly different perspectives on the employment of contingent faculty: Some maintain that the current trends away from tenure-line commitments are inevitable and effective, while others argue that the movement is endangering not only traditions and organizational vitality, but also students' academic outcomes. These two bodies of literature, and parallel literature from noneducational settings, are summarized below.

### Contingent workforce as strategic necessity

One strand of the higher-education management and leadership literature consistently asserts that the predominantly tenured faculty workforce of most nonprofit institutions constrains their ability to respond nimbly to emerging market conditions (Brewer and Tierney, 2011; Carey, 2015; Craig, 2015). Many authors within that literature extend the argument to suggest that the tenured workforce contributes to stasis and, potentially, to decline in colleges and universities. Perhaps most prominently, Christensen and Eyring (2011) argue that higher education requires large-scale "disruption" featuring nontraditional staffing and programming. Simplified, the argument of these critics is that schools with a predominantly tenured faculty workforce are 1) forced to maintain outdated curricula poorly attuned to emerging market conditions; 2) slowed by shared-governance norms associated with tenure

systems; and 3) tied down by heavy salary commitments to entrenched senior faculty.<sup>5</sup>

In making these arguments, critics of traditional faculty employment arrangements reflect longstanding views regarding employment in other industries. Employers in the for-profit sector outside of education, for example, cite many benefits to flexible staffing arrangements, including lower benefits costs (an increasingly important rationale in times of rapidly rising healthcare costs), the opportunity for screening for full-time employment, and greater adaptive capabilities for the organization (Houseman, 2001). Analysts of labor and organizations note additional implications less often mentioned publicly by employers. For example, Smith (1997) argues that the growth of contingent employment has the potential to strengthen hierarchical control of workers and, likewise, weaken the power of labor unions in particular.

Osterman (1987) notes that the use of secondary (contingent) labor can serve firms' pursuit of three primary organizational goals: cost-effectiveness, predictability, and flexibility. To succeed, however, contingent labor needs to mesh effectively with existing constraints posed by the organization's historic configurations of work, social relations, unions, and regulatory environment. Success depends on designing and implementing a core-periphery model that offers job security to core employees while surrounding them with a periphery of unprotected temporary workers.

Some observers have argued that employing contingent laborers may be most productive for emergent organizations, because such organizations often lack resources, legitimacy, and time to focus on human-resources management (Cardon, 2004). Such an approach can provide new knowledge or expertise; increase workforce flexibility; reduce fixed costs of labor; help create, import, and build knowledge; and generate social capital by reducing the number of layoffs of core employees (Matusik & Hill, 1998). Thus, contingent workers may be strategically most useful in highly

<sup>5</sup> The tightening of age-discrimination laws in the 1980s and Congress's ending of mandatory-retirement provisions in higher education in 1994 both contributed to rising seniority levels across colleges and universities (Ehrenberg, 2006).

competitive contexts facing pressures for flexibility and rapid technological change, when importing new human capital means importing knowledge across organizational borders.

Such benefits from the use of contingent faculty in higher education seem most useful in professional fields such as business and engineering, where contingent faculty may play a key role in attaching curricula and research more closely to developments outside higher education. O'Meara (2015) notes that more established faculty in other fields can potentially benefit from flexible approaches as well: If fully consulted, she suggests, such faculty may favor nontraditional staffing as a path for achieving increased diversity and other positive individual and organizational goals. O'Meara laments, however, the lack of research on the long-term outcomes of flexible organizational practices.

### **Contingent workforce as ineffective reform**

In higher education, the potential benefits of the greater curricular flexibility promised by moving to contingent labor are arguably offset by a number of potential costs, including: 1) high administrative costs of recruitment, socialization, training, and turnover associated with employing nontenure-track faculty on a contractual basis, whether full- or part-time; 2) “hand-off” problems associated with transferring core professional activities to a secondary labor force (a theme emerging from recent explorations in the health professions, which are increasingly using physicians’ assistants and nurses in roles traditionally assumed by physicians); 3) potentially lessened attention to student development across the curriculum because of the specialized and diffused attention of contractual faculty; 4) potentially lowered quality of instruction owing to dissatisfaction, alienation, and job-seeking among contractual faculty; and 5) deleterious effects from decreased numbers of faculty committed over the long term to ongoing institutional and departmental governance. For examples of these counterarguments, see Kalleberg (2000), Ehrenberg (2006), Umbach (2007), Ehrenberg and Zhang (2005), Toutkoushian and Bellas (2003), and Nollen (1996).

## **Conceptualization of the study**

This study investigates the following question:

*Does increasing the proportion of faculty on nontenure contracts lead to improvements in operational aspects of institutional performance over time?* Operational aspects of performance may include enrollment, applications, yield, student-faculty ratios, graduation rates, and financial health.

Much of the higher-education literature suggests that the answer to this question is affirmative. Yet this hypothesized relationship has not been systematically examined. Outstanding questions include: Does movement toward a more highly contingent faculty contribute in measurable ways to successful institutional adaptation? What other effects might such movement prompt? Are there unanticipated costs?

Advocates of contingent hiring would hypothesize that expanding such nontenure-track hiring could have positive effects on enrollment by allowing expanded capacity and course coverage in high-demand curricular areas. In a similar vein, advocates also would expect improvements in finances via lower pay, fewer benefits, and greater efficiency. Conversely, critics might expect that expanded commitments to contingent hiring would have negative effects on instructional quality given the empirical findings reviewed earlier. For example, they might expect students’ contact with established senior faculty to fall, along with their persistence and graduation rates.

Of course, it is logical to expect that higher proportions of contingent faculty will have differing levels and even directions of influence across different institutional types. For example, one might expect that the rise of contingent commitments might have especially positive influences on noninstructional and financial outcomes in institutions with the widest array of organizational goals, in that a more flexible academic workforce could free resources for the pursuit of nonteaching goals such as research and service.<sup>6</sup>

<sup>6</sup> This possibility is noted and explored by Zhang and Ehrenberg (2010), with mixed findings.



## Research design

To explore the connections between faculty workforce composition and institutions' strategic success, this analysis focused upon 1) examination of the most recent empirical evidence on trends in contingent faculty hiring; 2) quantitative analysis using institutional panel data regarding relationships over time between shifting contingent levels and shifting levels on varied outcomes, employing controls for institutional type/sector, control, size, finances, and other characteristics; and 3) interviews with a small sample of institutional leaders and observers regarding the connection between workplace flexibility and strategic outcomes in their institutions.

## Quantitative analyses

Because differences in institutional missions may be especially important for this research topic, we break out our quantitative analyses by institutional sector. We limit the analysis to nonprofit four-year institutions in the United States because of issues with applying available federal data on institutions to the public two-year college sector (see Jaquette & Parra, 2016); the very small size of the private two-year college sector; and the absence of reliable information on the for-profit sector. As expected, there are noteworthy differences in the implications of contingent labor forces among the six sectors included in our analysis: independent baccalaureate colleges; public baccalaureate colleges; comprehensive (master's-level) private institutions; comprehensive (master's-level) public institutions; independent research universities; and public research universities.

The methodological challenges in this work are formidable, and numerous threats to validity exist in the work—as in any work aiming to attribute institutional outcomes to one factor among the welter of potentially influential factors. By dropping missing and questionable

data values; incorporating statistical and analytic-sampling controls; instituting as many validity checks as possible in our analyses; and remaining cautious in venturing conclusions, we aim to provide an analytically defensible exploration of a difficult and little-explored proposition.

## Data and variables

Data for the study come from the Integrated Postsecondary Education Data System (IPEDS) and the affiliated Delta Cost Project. IPEDS provides comprehensive information on student enrollment, degree completion, revenues, expenditures, and other institutional variables at all accredited colleges and universities in the United States. Because of changes in the definitions and reporting requirements regarding full- and part-time faculty, observations are restricted to the years 2002 through 2013. After scrubbing the data to remove outlying, incorrect, or incomplete observations, the final sample includes approximately 1,200 four-year accredited institutions observed over 12 years of data collection, resulting in roughly 14,000 observations.<sup>7</sup>

As the literature suggests, the corps of contingent faculty is an inherently difficult population to define and track across and within higher-education institutions due to ambiguous job titles, conflicting roles and identities, and idiosyncratic institutional policies and procedures. Moreover, the IPEDS database has changed the definitions and origins of survey items numerous times since its first inception, including changes in how faculty and other employees are classified at the institution (see Fuller, 2011). Accordingly, some researchers conducting empirical research have argued that an acceptable proxy measure for contingent faculty is the percentage of part-time faculty employed by the institution (for examples, see American Federation of Teachers, 2003; Monks, 2007; Curtis & Jacobe, 2006).

<sup>7</sup> Institutions evidencing unlikely statistical anomalies were removed from our dataset, including institutions reporting for given years negative or zero enrollments, negative or zero percent yield from student applications, fewer than 10 applications, six-year graduation rates under 10% or over 100%, or a negative or zero student-faculty ratio.

We adopt an alternative approach, combining data from multiple years and panels to create a single, comprehensive dataset. Using techniques developed by Jaquette and Parra (2014, 2016), we use the HEGIS and IPEDS data to calculate the number of faculty that fall into one of three primary categories: (1) tenured; (2) on tenure track; and (3) not on tenure track. These categories include both part- and full-time faculty. Based on these classifications, the primary independent variable of interest is the percentage of part- and full-time nontenure-track (NTT) faculty. The percentage of NTT faculty is calculated using derived variables that measure the three classifications of faculty (tenured, on tenure track, and not on tenure track). The variable measuring the percentage of NTT faculty is lagged by one year to account for changes in the use of contingent faculty across time, thus measuring the effect of the prior year's observation on the current year's measurements of the outcome variables of interest.

Because myriad differences exist among institutional types and sectors, this study utilizes classification variables for each of the models based on public/private control and on basic four-year institutional type as defined by the Carnegie Classification, i.e., doctoral/research, master's (comprehensive), or baccalaureate (bachelor's).<sup>8</sup> The model is run separately for each sector and each control type to account for institutional differences in both factors leading to and outcomes of the use of contingent faculty. This approach results in six institutional classifications, and thus six models—one for each outcome studied.

As institutions increase or decrease the percentage of contingent faculty, it is anticipated that they also will experience changes in measures of overall institutional health, as indicated by factors such as changes in student enrollments, applications, yield rates, student-faculty ratios, graduation rates, and net revenues. Additional variables in the models control for factors that could influence the outcomes of interest, including federal grants and contracts (logged), state

appropriations (logged), state contracts and grants (logged), FTE count (logged), time, proportion of part-time students, percentage of African-American and Hispanic students, and percentage of students receiving Pell Grants. Table 1 describes the variables in the analysis.

### **Analytic technique**

The longitudinal format of the data in this study necessitates techniques that account for particular issues associated with panel data. The same institutions are observed on the same outcome variables at multiple points across time, which has the potential to generate unit effects, autocorrelation, and temporal correlation. In other words, the observations at one time will be significantly associated with observations at another time (Hsiao, 2003). Because of missing data for some institutions in some years within the IPEDS dataset, the panel analysis is not balanced; that is, the number of institutions statistically analyzed differs across models.

In addition, because observations of the same unit across time will be highly and positively correlated, with previous observations affecting the value of current observations, coefficient estimates of regression models can be biased. Several techniques exist to account for and correct this autocorrelation, including the use of a lagged independent variable, and the specification of a model that corrects for unobserved heterogeneity in the model covariates (Hsiao, 2007).

This study utilized a fixed effects (FE) model to control for time invariant differences among institutions. The FE model is a generalization of a linear regression that estimates fixed, or nonrandom, quantities for the parameters in the regression model. In panel data analysis, the fixed effects estimator (or within estimator) estimates the coefficients in the regression model that include fixed effects (or time-invariant intercepts). The purpose of the FE model is to control for unobserved heterogeneity that is constant over time. It assumes that individual-specific (in this case, institution-specific)

<sup>8</sup> In addition to two-year and for-profit institutions, our analyses eliminate specialty institutions and tribal colleges and universities.

effects are correlated with the independent variables in the model (Hsiao, 2003). The notation of this model is defined as:

$$y_{it} = \beta_1 X_{it} + \alpha_i + u_{it}$$

where  $y_{it}$  is the dependent variable with  $i$ =entity and  $t$ =time;  $X_{it}$  is an independent variable;  $\beta_1$  is the coefficient estimate for the variable;  $\alpha_i$  is the unknown intercept for each entity (or institution); and  $u_{it}$  is the error term.

One advantage of the FE model is that it holds institutional characteristics constant over time; thus, any changes in the dependent variable are attributed to characteristics aside from the fixed covariates. Some analysts have suggested including the lagged dependent variable on the right-hand side of the equation to account for the autocorrelation among observations of the same entity across time. However, the FE model is generally a preferred approach when the model is assumed to have individual effects, as the lagged dependent variable model requires elimination of the unknown individual effects. Moreover, because the FE model controls for all of the time-invariant differences between entities in the panel, the coefficients of the fixed effects are not biased by unobserved characteristics that are not included in the model (Fitzmaurice, Laird, & Ware, 2012).

## Qualitative analyses

To better understand the implications of increasing the proportion of NTT faculty for institutional performance, we supplemented our quantitative analysis with a small sample of qualitative interviews. We conducted several hourlong, semistructured interviews with administrators (i.e. college deans and chief academic officers) and NTT faculty members regarding the potential for flexibility and the outcomes associated with the use of contingent faculty. To address nuances across sectors, our participants came from a variety of institutional types, including a technical college, a research university, and a private master's-level college. These interviews helped illustrate how institutional leaders and faculty members envision institutional strategy and its implications for

performance. By providing illustrative quotations in the text that follows, we aim to give voice to the patterns we see in our quantitative findings.

## Findings

Table 2 presents the sample breakdown across institutional types, and Figures 1 through 7 report trend data for key indicators across the 12-year timespan of the data. Table 3 reports descriptive statistics for all institution/year observations of independent and dependent variables of interest: percentage of NTT faculty, freshmen enrollment, applications, yield, student-faculty ratio, six-year graduation rates, and net revenues; plus information regarding our control indicators for federal contracts and grants, state contracts and grants, state appropriations, FTE enrollment, and racial and socioeconomic characteristics of the student population.<sup>9</sup>

The descriptive data and figures suggest several major themes important for the consideration of contingent employment and its potential effects:

First, the wide ranges in values for our various indicators, even with the outlier-culling we employed, suggest that institutions' business models, scale, and scope differ substantially across U.S. higher education. To generalize to "American higher education" is, more often than not, misguided.

Second, the number of applications students submitted rose dramatically over the study period, no doubt facilitated by streamlined online application systems and the Common Application. This rise was especially apparent in the public and private doctoral sectors, which tend to be more selective. Not surprisingly, the rise in applications was accompanied by declines in yields in most sectors.

Third, core educational production processes appeared to remain rather steady across the period. Specifically, student-faculty ratios and six-year graduation rates changed little, and freshmen enrollment changes

<sup>9</sup> Time is omitted from the descriptive statistics. Categorical variables are aggregated and reported for all years of analysis.



were not dramatic, despite increasing pressures on institutions to improve efficiency in the face of strained governmental and family resources.

Finally, net revenues were relatively stable around zero across all sectors except the private doctoral institutions, which experienced dramatic fluctuations, probably owing to volatility across varying economic conditions that affect the large endowments of many of those institutions. Note, too, that the most difficult years of the Great Recession (2007-2008) took an especially dramatic toll on net revenues in that sector.

Table 4 shows the effects of the composition of the faculty, lagged one year, within the six four-year institutional sectors. Results for six modeled dependent variables are presented. Note that because many other analyses have examined and reported on the effects of various factors other than the composition of the faculty, which is our focus here, Table 4 does not present coefficients for the effects of our various control variables. To reiterate, for each dependent institutional variable, we included in our models controls for appropriate institutional factors that earlier research suggests would be related to indicators of institutional health, including FTE enrollment (log), federal contracts and grants (log), the proportion of part-time students, the percentage of African-American and Hispanic students, and the percentage of students receiving Pell Grants. For public-sector institutions, we also included controls for state appropriations (log) and state contracts and grants (log). All analyses also contained controls for time, to remove time trends as factors. None of the resulting coefficients for these various control factors were surprising in light of earlier research. In the discussion below, we focus on effects significant at the  $p < .05$  level or higher.

There were no observed effects of varying proportions of NTT faculty on freshmen enrollment in any of the six sectors. Assuming the models were well designed, it appears that increasing proportions of NTT faculty do not relate closely to this academic domain. Proponents of that managerial choice might be heartened by these results. After all, their argument is that there are few or no deleterious effects of NTT commitments on core

academic operations. And, if moves to more contingent composition lower overall educational costs, the absence of deleterious NTT effects on institutional enrollments could be considered supportive of the choice. On the other hand, proponents often view NTT commitments as a path to increased educational capacity (through expansion of course offerings and course sections, more faculty advising, and so forth), and thus expect that greater proportions of NTT faculty will produce increased enrollments. No evidence emerged supporting that proposition.

In four other domains, levels of NTT employment were associated with unfavorable outcomes: higher levels of NTT commitments were associated with lower applications volumes in private baccalaureate and master's-level institutions, lower yields in private doctoral institutions, lower graduation rates in private doctoral institutions, and lower net revenues in public baccalaureate institutions. Lowered graduation rates in private universities have been found before in earlier published work (Ehrenberg & Zhang, 2005), and raise one of the most serious objections to the move toward contingent faculty hiring. It may be that the lack of firm, ongoing institutional commitments among NTT faculty hinders their capacity for giving full attention to maintaining and spurring student retention.

The mechanisms lowering applications and yields in certain private institutions in concert with NTT commitments are less clear. Perhaps these findings hint at connections between faculty roles and existing and anticipated demand. Might shifting away from tenure-line faculty somehow detract from private schools' performance in the competitive market for student enrollment? For example, rankings such as those of *U.S. News & World Report* consider a variety of indicators of faculty quality, such as measured faculty resources, peer assessments, and high-school counselor rankings. Perhaps NTT commitments shape these factors, which in turn shape the fate of institutions in the competition for student applications and enrollments. That said, we have only limited understanding of how faculty composition affects prospective college students' decision processes.

We should note that we also explored an alternative conceptualization of the relationship between NTT commitments and applications, yields, and freshmen enrollment. Specifically, we examined whether institutions with lower applications, yields, and freshmen enrollments might hire more NTT faculty, perhaps out of perceived financial necessity. This idea runs conversely to our initial idea that institutions might raise NTT commitments in order to achieve higher applications, yields, and freshmen enrollments. While the results of our reverse causality tests with varying lags did not support the alternative inference, that possible pattern is worth further analysis.

Also meriting further analysis is the connection uncovered here between contingency and lowered net revenues in public baccalaureate institutions. Accepting as sound our statistical models' direct controls for time trends and the models' de facto controls (via fixed-effects modeling) for confounding factors specific to individual institutions, one must attribute this effect to either decreasing revenues or rising costs. Any specific causal connection remains unclear and unproven. For now, the results for net revenues simply raise a cautionary flag for proponents arguing that NTT growth can aid institutions' bottom lines. In the context of a variety of controls, the move seems to work against the financial health of public baccalaureate institutions and seems to provide no financial benefits to institutions in other four-year sectors.

NTT commitments were negatively associated in our statistical models with several outcomes, as presented in Table 4 and discussed above. Those negative relationships were quite limited, however. Much more frequent was a finding of no relationship between NTT commitments and the identified outcomes. Interestingly, the most consistent finding of the analysis was for another outcome, and the results are seemingly favorable for NTT commitments: Across all six institutional sectors, higher NTT commitments were associated with lower student-faculty ratios. This consistency might seem at first glance simply definitional; that is, as more NTT faculty are added, total faculty ranks grow, and thus the ratio's denominator

grows and, all else equal, the student-faculty ratio falls. But there is no "all else equal" in that a likely scenario is that NTT faculty are replacing retiring or departing tenure-track faculty (and thus not necessarily increasing the total full-time equivalent number of faculty). It may be that institutions are adding more NTT than tenure-track faculty and thus changing the composition of the faculty; under that scenario, total faculty numbers could go up, go down, or remain steady.

It would be irresponsible to draw conclusions about the lived experiences of individual students in specific programs at specific educational levels from a ratio aggregated at an all-institution level. Specifically, it would be a mistake to infer positive student outcomes from our student-faculty ratio findings here. Naturally, one possibility is that NTT hiring is benefitting students because it leads to smaller classes, more faculty-student interactions, more course availabilities to aid student progression, and so forth. But there are other scenarios. It may be that institutions substitute NTT part-time faculty for tenure-track faculty, allowing the aggregated ratio to "improve" while not affecting the class sizes experienced by individual students. That is, the teaching "load" of tenure-track faculty could decline, allowing them—rather than students—to reap the benefits of the shift to NTT hiring.

## Implications

Overall, we infer three major themes regarding the effects of shift toward a higher proportion of NTT faculty. First, our models reveal mixed effects on institutional outcomes from higher NTT commitments. Of 36 modeling examinations of NTT commitments—across six institutional sectors and six institutional outcomes—11 coefficients suggested statistically significant relationships. Of those 11, five may be considered deleterious outcomes for institutions. In contrast, six effects were in directions that could arguably be considered beneficial outcomes, with each sector showing improved student-faculty ratios. Thus, although NTT commitments were unrelated to institutional outcomes in the majority of our modeling, we did find a number of statistically significant relationships spanning both positive and negative effects.

Second, although there is always a need for more research on virtually any topic, that familiar observation seems especially apropos for the academic outcomes examined here. Student-faculty ratios were the outcome most closely associated with rising NTT commitments in our analysis. Not only were the effects of rising NTT commitments on this outcome uniformly significant in the analysis across all four-year sectors, but those effects were consistently in the direction of lowering student-faculty ratios. That is, it appears that institutions are improving their student-faculty ratios as they increase the proportion of NTT faculty in their academic workforce. Student-faculty ratios are a significant factor in prominent ranking systems, including that of *U.S. News & World Report*, so this apparent effect of NTT commitments may be especially welcomed by institutions in highly competitive, prestige-driven markets. More fundamentally, lower student-faculty ratios have long been theorized and found to be associated with more favorable educational outcomes at all levels of education. Thus our primary indicator of educational processes showed positive association with higher NTT commitments. Yet, as discussed above, the ratio results are also subject to less optimistic interpretations, and our results only hint at causation.

We buttressed our statistical analyses with interviews with a small sample of college faculty and leaders in a variety of four-year institutions. Overall, these interviews reflected the academically positive inferences from our statistical analyses. An academic affairs vice president told us:

It seems like...all the colleges [in his public research university campus] have a lot of adjuncts but it's kind of strategic for [vocationally focused] colleges. It's trying to provide something that we wouldn't otherwise be able to. In a perfect world everyone would be full-time but it's a little unrealistic. We wouldn't be able to grow the way that we've grown. ...We wouldn't be able to keep up...We need fresh new ideas coming in all the time.

In a similar vein, a dean at a liberal arts college praised the ways her school's commitment to NTT hiring was facilitating strategic academic development:

In the last five years...our enrollment in the college of liberal arts has gone up 25%...It's significant [and] it's wonderful to grow but we need to make sure that we're growing in our faculty in the right ways and in the right places...so having a little flexibility with the lecturers is helpful. We have to be very careful where we add full-time positions so I think [NTT faculty] are a stopgap in some ways.

It is thus hard to dismiss the idea that increased hiring of NTT faculty may bring some immediate educational benefits to college and university students in course offerings and teaching/advising conditions. Findings for the study's sole indicator of ultimate educational outcomes tell a less positive story, however: Graduation rates appeared statistically unaffected by the move to contingent hiring in five sectors, and actually fell in private doctoral universities. What might explain this seemingly contradictory finding on the educational effects of NTT hiring? It is clear that aggregated student-faculty ratios are not sufficiently precise indicators of the quality of attention and support undergraduate students are receiving as they proceed with their studies. More fine-grained analysis of the academic implications of NTT hiring, across the span and locations of different students' educational careers, is warranted. For now, the case for contingent hiring as a path to improved educational outcomes remains unproven.

The third major theme in our findings was also sobering: We found no evidence that increasing NTT commitments benefitted institutions' "bottom lines;" and in public baccalaureate institutions, the opposite may be true. Falling net revenues in those schools suggest that the business implications of the move to contingency may not be at all clear cut. Zhang and Liu (2010) found that, although the growth of NTT ranks tend to lower expenses in some areas, that growth may be associated with higher salaries for tenure-track faculty. That growth might also increase R&D expenditures, all else equal

(Zhang and Ehrenberg, 2010). Such findings are in line with work by Rosinger et al. (2016), suggesting that institutions tend to concentrate NTT hiring in low-prestige departments, while allocating more robust resources to units more central to the “prestige economy” that frequently rules within contemporary colleges and universities. To the extent such patterns hold, an employment initiative seeming likely on the surface to produce positive outcomes (i.e., better revenue-expense relationships) might in fact produce offsetting financial negatives, diluting the expected positive returns. Depending on an institution’s distribution of teaching, research emphases, and resources, those counterinfluences could tilt net revenues either negatively or positively. That possibility is examined convincingly in substantially more detail in Hurlburt & McGarrah (2017).

Explicit in much of the applied literature on higher-education strategy and change is the notion that the movement to contingent faculty can create needed strategic flexibility. The literature also provides some dissent on this proposition, however, suggesting that the costs of contingent commitments outweigh the potential returns in cost savings and increased adaptive responsiveness. The study findings here provide little support for blanket condemnation of the shift to NTT

faculty. But it is important to note the converse as well: Beyond shifting student-faculty ratios—the effect of which is difficult to discern at the aggregate level—neither do we find evidence of effects that support the shift to NTT faculty. In particular, the financial health of colleges and universities does not appear strongly influenced either way. In the end, to paraphrase a familiar observation from Sherlock Holmes, the dog that didn’t bark can provide as much information as the one who did. Both the positive and negative arguments remain in play.

The ultimate test of these arguments must come through comprehensive, integrated analyses of institutions’ marketplace success, financial operations and, especially, academic outcomes. For now, however, nothing found in this study is likely to broadly stimulate or deter the movement to contingency. Ideally, this effort to address empirically a notable and significant gap in the literature will contribute to further discussions and analyses of a critical topic for the further evolution of higher education in the United States.

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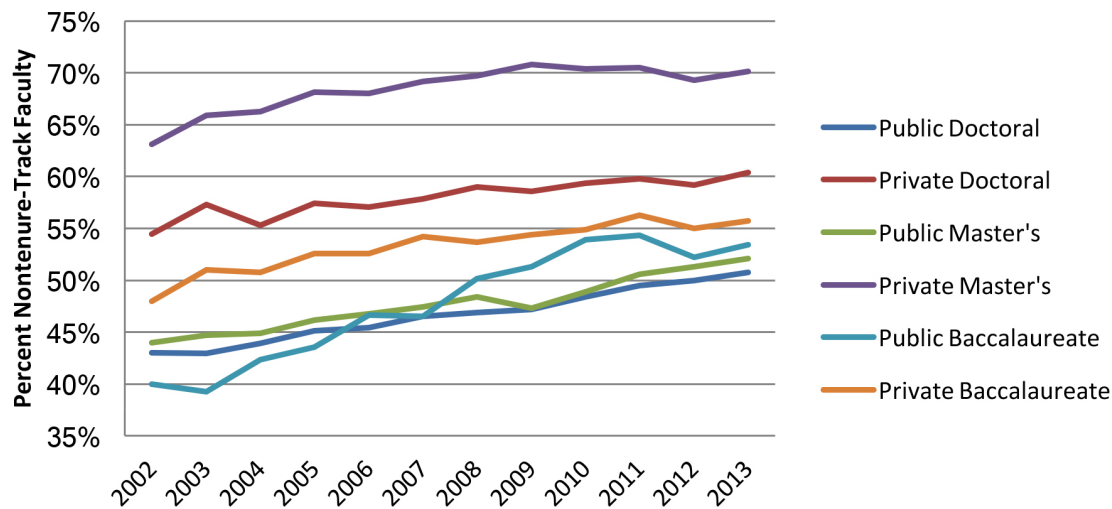
**Table 1: Variable descriptions and sources**

Variable	Description	Source
Percent of Faculty not on Tenure Track*	Percentage of full-time and part-time faculty that are not employed in tenured or tenure-track positions. Includes full-time nontenure-track individuals, part-time nontenure-track individuals with faculty status, and part-time nontenure-line individuals without faculty status employed in research, instruction, or service.	Integrated Postsecondary Education Data System [IPEDS]
Freshmen Enrollment	Total full-time and part-time freshmen enrollment in the fall semester.	IPEDS
Applications	Total number of applicants for admission. Includes first-time degree/certificate-seeking individuals who have fulfilled the institution's admission requirements.	Delta Cost Project
Yield	Percentage of admitted full-time and part-time students that enroll in the institution.	IPEDS
Student-Faculty Ratio*	Ratio of full-time and part-time graduate and undergraduate students to the total number of faculty.	IPEDS
Six-Year (150%) Graduation Rate	Percentage of first-time, full-time students that graduate within 150% time (6 years) of enrollment.	IPEDS
Net Revenues*	Total revenues minus total expenses.	IPEDS
Federal Contracts & Grants	Transfer of money from the Federal government to academic institutions, via contracts and grants.	IPEDS
State Contracts & Grants	Total revenues from government agencies for use in training programs and related activities.	IPEDS
State Appropriations	Total of operating funds transferred from home-state legislative body to academic institutions.	IPEDS
Full-time-Equivalent Enrollment	Total number of full-time and part-time graduate and undergraduate students enrolled at the institution, adjusted for credit-hour enrollment.	IPEDS
Part-time Enrollment*	The proportion of students enrolled in less than 12 semester credits.	IPEDS
Percent African-American*	The percentage of students who identify as Black/ African-American.	IPEDS
Percent Hispanic*	The percentage of students who identify as Hispanic/ Latino.	IPEDS
Percent with Pell Grants	The percentage of full-time students receiving Pell Grants, which provide grant assistance to undergraduate students with demonstrated financial need.	IPEDS
Institutional Type*	Classification of institution based on highest degree offered (doctoral/research, master's/comprehensive, baccalaureate/bachelor's) and institutional control (public or private).	IPEDS
Academic Year	Academic year of observation.	IPEDS

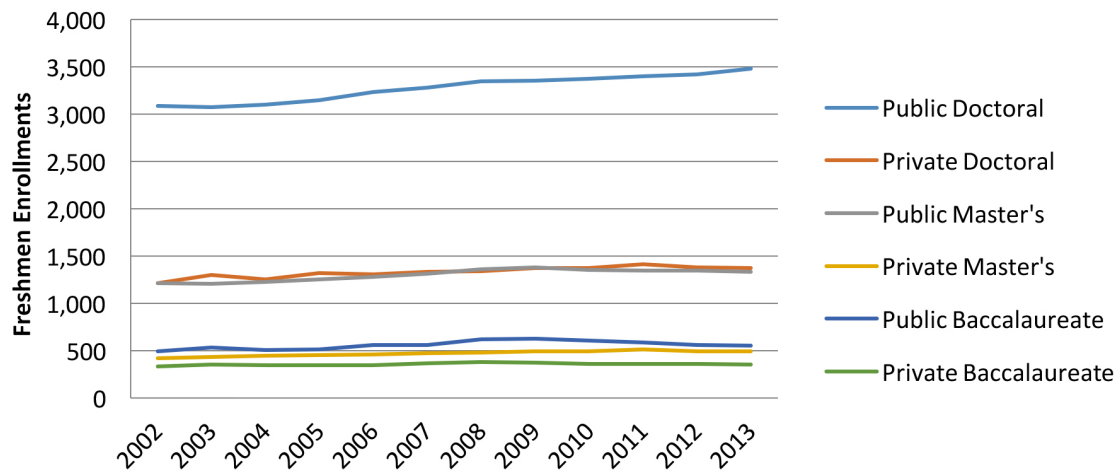
\*Constructed indicator using IPEDS indicators

**Table 2: The institutional sample in 2013**

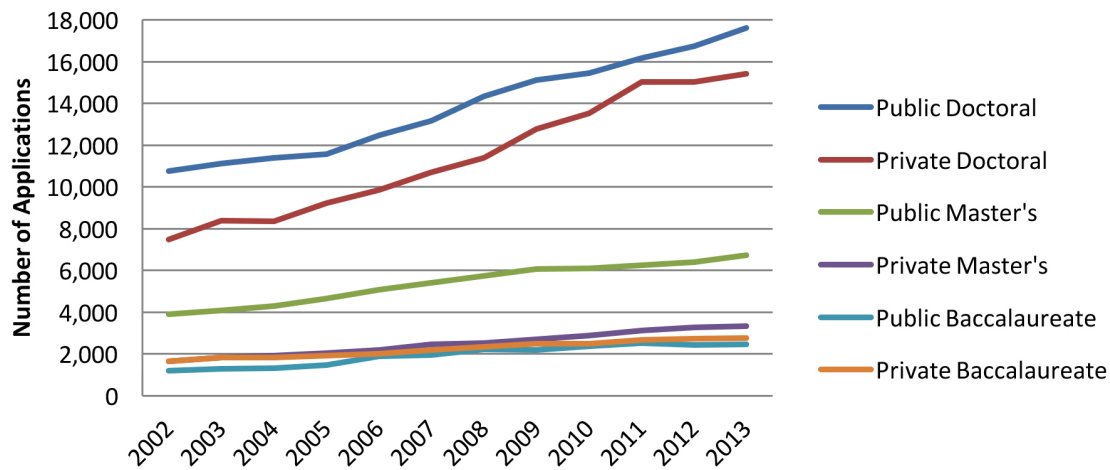
Institutional Type	Number of Institutions	Percent of Sample
Private Baccalaureate	357	29.5
Public Baccalaureate	48	4.0
Private Master's	337	27.9
Public Master's	192	15.9
Private Doctoral	108	8.9
Public Doctoral	167	13.8
Total	1,209	100.0

**Figure 1: Percent nontenure-track faculty, by year**

**Figure 2: Freshmen enrollment, by year**

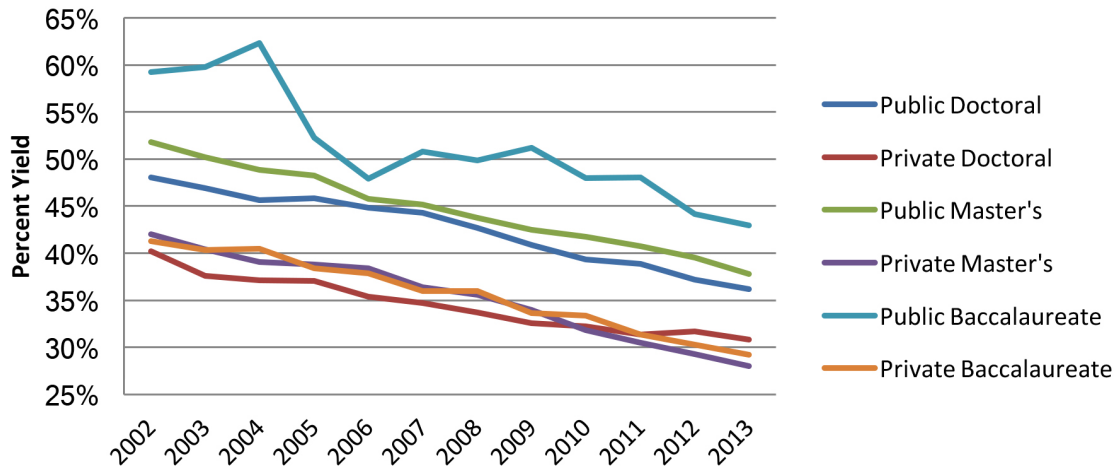


**Figure 3: Applications, by year**

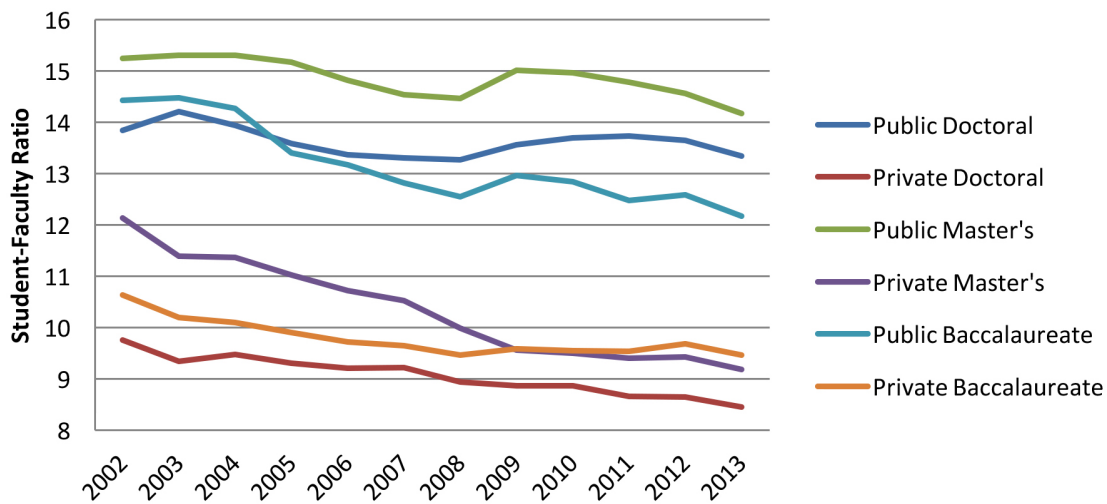




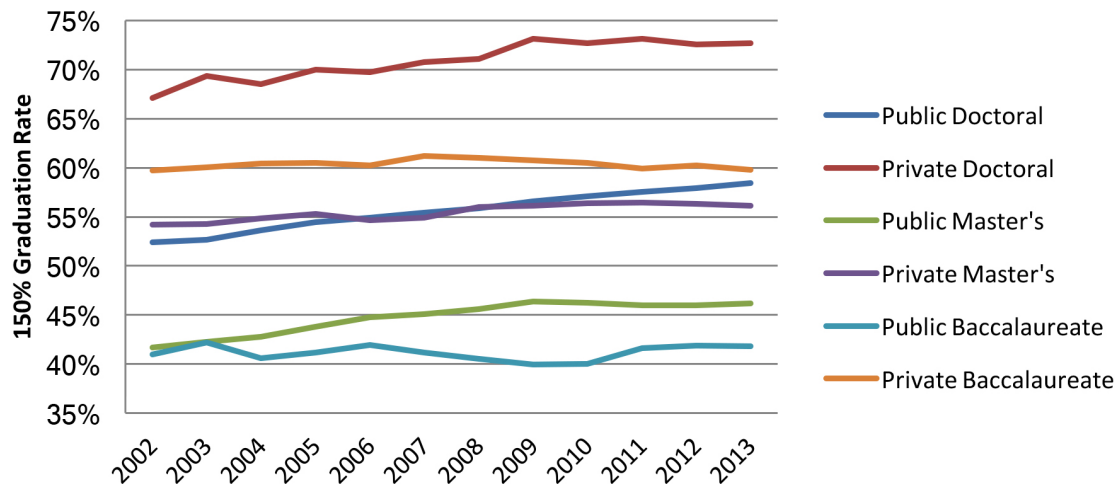
**Figure 4: Percent yield, by year**



**Figure 5: Student-faculty ratio, by year**



**Figure 6: Six-year (150%) graduation rate, by year**



**Figure 7: Net revenues, by year**



**Table 3: Descriptive statistics for variables of interest**

Variables	Mean	Standard Deviation	Minimum	Maximum
Percent of NTT Faculty	56.0%	22.9%	0.0%	100.0%
Freshmen Fall Enrollment	1,046	1,299	10	16,650
Applications	5,269	7,274	14	100,247
Yield	38.4%	16.2%	5.1%	100.0%
Student-Faculty Ratio	11.36	5.26	1.31	155.51
Six-year (150%) Graduation Rate	56.0%	17.3%	10.0%	100.0%
Net Revenues (thousands)	\$26,957.34	\$234,890.50	-\$8,016,165.00	\$6,491,923.00
Federal Contracts & Grants (thousands)	\$41,455.05	\$127,442.10	\$0.00	\$1,626,012.00
State Contracts & Grants (thousands)	\$6,342.66	\$16,549.79	\$0.00	\$211,634.50
State Appropriations (thousands)	\$40,049.99	\$97,732.42	\$0.00	\$1,095,938.00
FTE Enrollment	6,214	8,179	63	78,040
Percent Part-Time	2.3%	5.4%	0.0%	100.0%
Percent African-American	12.0%	18.3%	0.0%	100.0%
Percent Hispanic	6.2%	8.0%	0.0%	92.7%
Percent Receiving Pell Grants	40.1%	20.1%	3.6%	99.9%

Notes: This table presents descriptive statistics for institutional observations included in our analysis. Some indicators are scaled in our regression analysis to ease interpretation and account for skewed distributions; this table presents data in raw form, however, to provide a more straightforward comparison among variables. Financial indicators are inflation adjusted to 2014 dollars using the Consumer Price Index.

**Table 4: Effects of increasing proportions of nontenure-track faculty on selected institutional outcomes**

Institutional Sector	Dependent Variables					
	Freshmen Fall Enrollment	Applications	Yield	Student-Faculty Ratio	Graduation Rate	Net Revenue
Baccalaureate						
Public	-49.9	41.7	.00	-7.0***	-.04	-8.9*
Private	-31.7	-292.8*	-.01	-6.0***	.03	-.63
Master's						
Public	-72.9	249.3	-.07	-11.6***	-.01	-1.1
Private	9.8	-407.0*	-.01	-12.0***	.01	1.8
Doctoral						
Public	135.8	1928.0	-.01	-12.1***	.01	-3.2
Private	-.06	-733.0	-.04*	-10.2***	-.04*	.00

Note: Significance tests are reported to indicate the strength of relationships, where \*\*\* $p \leq .001$ , \*\* $p \leq .01$ , and \* $p \leq .05$ .

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**James C. Hearn** is Professor and Associate Director in the Institute of Higher Education at the University of Georgia. He holds a Ph.D. in sociology of education and an M.A. in sociology from Stanford University, and earned earlier degrees from Duke University and the University of Pennsylvania. His research and teaching focus on postsecondary education organization, finance, and policy. His work on faculty workforce issues in colleges and universities, reported here, is part of his broader research emphasis on colleges' and universities' adaptations to shifting economic, demographic, and political conditions. Under that emphasis, he has recently studied innovations in institutional financial operations and governance; trends toward marketization and performance accountability in postsecondary institutions and systems; colleges' use of intercollegiate athletics as an enrollment-management tool; test-optional and no-loan policies on campuses; and the shifting ecology of state higher-education policymaking. Hearn's research has been published in sociology, economics, and education journals as well as in several books. He currently serves as a member of the editorial board for the *Journal of Higher Education*, a consulting editor for *Research in Higher Education*, and a TIAA Institute Fellow.

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