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What Determines Employment of Part-Time Faculty
in Higher Education Institutions?

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Abstract

This study uses a cross-section national sample of four-year colleges and universities in the United States to examine the variation of part-time faculty employment. Results of this study suggest that higher educational institutions actively design and adopt contingent work arrangements to save on labor costs and to manage their resource dependence with constituencies. Institutions that pay high salaries to their full-time faculty members, have limited resource slack, and are located in major urban areas tend to employ a high proportion of part-time faculty. Furthermore, institutions that have small student enrollment and large proportion of part-time students are found to rely more heavily on part-time faculty employment. Private institutions, on average, have higher levels of part-time faculty than their public counterparts; however, this result does not hold for doctoral and research institutions. Finally, institutions that rely more on tuition and fees revenue tend to employ more part-time faculty. Such a relationship is significantly moderated by institutional quality, suggesting that different institutions may adopt different strategies to attract students and secure their tuition revenues.

What Determines Employment of Part-Time Faculty in Higher Education Institutions?

As organizations struggle for flexible and efficient ways of managing their human resources to gain competitive advantages in global economy, the American workforce has experienced a tremendous increase in the adoption of contingent employment over the past two decades (Cappelli 1999; Houseman 2001). Contingent employment departs from conventional practices in that the former breaks down traditional continuous employment into segments of limited duration while the latter elicits mutual expectation of full-time employment for an indefinite period (Kalleberg 2000; Polivka and Stewart 1996; Summers 1997). Most studies on contingent employment have rested on the dual labor market framework that workers who are vital to an organization's core activities receive job security (among other benefits) to strengthen their loyalty to the institution and to reduce turnover. Meanwhile, in response to environmental turbulence, organizations need flexibility in adjusting employment levels. Because such a need could not be readily accomplished by the internal policies governing core employees, organizations may concentrate their adjustments in the workforce "periphery," who are less crucial to organizations. In other words, job instability and insecurity are explicitly redistributed away from a core of permanent employees toward less formal workers on the periphery. Not surprisingly, commentators generally portray contingent positions as low-skill and low-discretion; consequently, these workers are viewed as less valuable and even marginal.

Yet contingent employment arrangements have become more complex in an era of organizational downsizing and general job insecurity. There have been ample evidences that organizations deliberately assign core organizational functions to contingent workers and that their assignments last for prolonged periods (e.g., Gramm and Schnell 2001; Matusik and Hills

1998). Contingent workers frequently fill vital organizational positions, rather than performing unskilled tasks on an *ad hoc* basis. Complicating the matter further, contingent and regular workers often have similar job duties, skill requirements, and even performance objectives (Lautsch 2002). As the contingent workforce becomes more prevalent and diverse, existing empirical studies of the division between permanent and contingent employees seem inadequate in explaining the function of contingent employment in core organizational functions.

This study investigates contingent employment at colleges and universities in the United States. Although higher education institutions receive little attention in research on contingent work arrangements, the use of contingent faculty has grown at an unprecedented pace in recent decades. For example, in the academic year 1987-1988, about 33.8% of all faculty members were employed part-time, but by 2005-2006 the proportion had increased to 52.3%.¹ Such an increase coincided with other dramatic changes in higher education during the last several decades. Perhaps the most significant change is the financing pattern for higher education institutions, especially at public colleges and universities. For example, the share of public institutions' revenues from state appropriations decreased from about 44% in the early 1980s to about 32% in recent years (National Center for Educational Statistics 2005).

The shrinking public funding and increasingly unpredictable revenues for higher education institutions have resulted in a series of institutional behaviors parallel to those that occur in a competitive market. For example, colleges and universities are aggressively expanding their potential revenue sources and diversifying their revenue portfolios. Revenues from tuition and fees, grants and contracts, endowments, and auxiliary enterprises become increasingly

¹ Authors' calculation from the Fall Staff Survey of the Integrated Post-secondary Education Data System (IPEDS) administered by the National Center for Education Statistics. Here the definition of faculty (whose main responsibility is instruction, research, and public service) does not include administrative, managerial, technical, clerical, secretarial, skilled crafts, and maintenance employees on campus.

significant. At the same time, the concept of economic efficiency and cost containment has worked its way into higher education institutions. Departments and programs are prioritized and retrenched in an effort to gain economic efficiency.

In addition to the shift in the financing pattern, demographic change in college students, technological advances in teaching and learning, and the heightened sense of consumerism among students and their families have led to increased competition among colleges and universities in recent decades. Given the market character of their environment, many higher education institutions have adopted more business-style strategies to cope with changes.

This study develops an empirical model of an institution's propensity to use part-time faculty at colleges and universities in the United States. Our detailed organization-level data come from the National Center for Educational Statistics (NCES). All post-secondary institutions in the United States are federally mandated to collect and report institutional information to the NCES. Such comprehensive data permit us to test the influence of a variety of factors on the practice of contingent employment across higher education institutions. Moreover, in contrast to most prior work, our study focuses on the use of part-time faculty in an organization's "core job group," which is defined as the largest group of non-managerial employees (Osterman 1994), because the mix of contingent and conventional employment in core positions is more critical to institutional success than the mix of work arrangements in peripheral, supporting functions (Lautsch 2002). In addition, because work practices often vary across different job groups within an organization, our focus on faculty reduces confounding effects due to occupational heterogeneity while simultaneously allowing for sufficient variation in institutional and environmental characteristics.

Theory and Hypotheses

Internal labor market (ILM) theory provides major arguments to explain the manner in which organizations shape employment structures in response to internal characteristics and external demands (Doeringer and Piore 1971; Osterman 1987). ILM theory proposes that organizations may design distinct employment sub-systems in order to achieve economic efficiency and to manage their dependency on social institutions. On the one hand, in tasks that involve firm-specific skills and high technological requirements, an organization need to invest in specific training in order to prepare new employees for various on-the-job idiosyncrasies such as equipment, procedure, and culture. To ensure the return on its investments, the organization tends to use internal governance structure and long-term labor contract to stabilize employment. One the other hand, organizational practices are heavily constrained by internal and external agents who can exercise control over scarce valuable resources. Powerful external agents such as governments and unions can impose preferred structures on organizations by linking compliance with resource allocation (Pfeffer and Cohen 1984). Employment practices thus reflect an organization's efforts to smooth the flow of resources with their constituencies.

These considerations result in the core-periphery division of labor within an organization (Mangnum, Mayall, and Nelson 1985; Cappelli and Neumark 2004). In general, employees in the core receive high wages, good working conditions, employment stability, job security, due process in the administration of work rules, and opportunities for advancement. In contrast, peripheral jobs feature low wages, less favorable working conditions, considerable variability in employment, and little opportunity to advance. The most significant distinction between core and periphery is mutual expectation for the core of job stability and security. Employees in the

periphery have to face substantial instability in employment, and their jobs usually are not connected to either a wage or a promotional ladder.

While ILM theory largely ascribes the outcomes of employment systems to distinct job characteristics, recent studies have found that insights from this framework are useful in understanding how employment structures within core jobs may differ (e.g., Gramm and Schnell 2001; Lautsch 2002). In the contexts of higher education institutions, employment practices in core positions exhibit the characteristics of an internally stratified labor market. Full-time academic appointments at colleges and universities display clear characteristics of an internal labor market. Hiring institutions carefully select a core group of talents, nurture opportunity for their advancement through research supports and internal mentoring, provide substantial job security, and take other elaborate measures to reduce their turnover and maintain their attachment to the institutions. The establishment of a tenure system characterized by internal promotions and substantial job security has been widely accepted as the foundation for faculty's pursuit of scholarly excellence and academic freedom.

As the presence of internal labor markets and stability for core employees come with inherent costs (e.g., high labor costs and head-count rigidity), institutions may strategically maintain a group of market-mediated positions to complement core posts in an effort to achieve institutional flexibility and reduce constraints from the internal labor market rules. Although the fit is not perfect, part-time faculty display some characteristics of such market-mediated positions. First, instability is a structural characteristic of these positions since either a termination date is part of the job description or continued employment is explicitly stated by the employer. Second, less favorable working conditions are also characteristic of part-time positions as the holders of these positions are routinely assigned instructional tasks that most

professors would just as soon avoid: large classes, multiple sections of the same course, introductory or remedial courses, and classes at unfavorable working hours. In addition, compensation to part-time faculty is comparable to market wages rather than merit increases. Finally, on many campuses, faculty holding part-time appointments are not encouraged to participate in matters of university businesses. They often are not allowed to serve on doctoral committees nor are they allowed to apply for research grants or travel supports. Some do not even participate in the university's pension program. Therefore, part-time faculty can be viewed as peripheral academic workers in core positions who do not have access to tenure and whose working conditions are substantially inferior to those holding tenure-track positions.

This study employs ILM arguments, as well as arguments and findings from the contingent employment literature, to specify hypotheses about the antecedents of part-time faculty employment in colleges and universities. We believe that higher education institutions strategically design and adopt contingent work arrangements to save on labor costs and to smooth the flow of resource exchange with their constituencies. Based on prior research, this study focuses on the potential influence of full-time faculty salaries, resource slack, location, size, student enrollment status, types of institutions, and tuition revenues. It is noteworthy that all following hypotheses are phrased in a *ceteris paribus* fashion.

Organizations may offer some employees a wage premium to attract qualified job applicants, create job incentives for high productivity, and reduce turnover (Lazear 1998). While it may be ideal to compensate all employees at a premium rate, organizations require flexibility in adjusting the quantity and skill sets of their workforce in response to environmental changes. Recent evidence indicates that contingent faculty earn less and are less likely to have health insurance and pension benefits than regular faculty. While salary levels for part-time faculty are

usually not available because in most cases they are paid on a per-course basis, anecdotal evidence shows that cost savings may be substantial.² Thus, colleges and universities that offer relatively higher salaries for regular full-time faculty will have a greater incentive to use part-time faculty.

Hypothesis 1: Employment of part-time faculty is positively related to the salary level of full-time faculty.

Organizations may have more discretion in determining employment structure when they have the financial capacity or working capital to resist external pressure. According to Jensen's (1989) findings, organizations prefer to deploy slack toward asset capitalization rather than distribute it as dividends to shareholders because increased asset capitalization enhances the social prominence and political power of senior administrators. Investments in tenured and tenure-track faculty represent major asset capitalization in educational institutions; such investments symbolize the advancement and prestige of an academic institution. Thus, colleges and universities are likely to resist external pressures when they can deploy slack resources. In contrast, when slack resources are low, institutions have the incentive to use contingent faculty and to reduce costs. In addition, the use of contingent faculty also generates short-term financial slack for low-budget organizations.

Hypothesis 2: The employment of part-time faculty is negatively related to the level of financial resources at colleges and universities.

² Monks (2004) used individual-level data from the National Study of Postsecondary Faculty and found that part-time faculty are paid approximately 64% less than full-time tenured or tenure-track faculty on a per-hour basis.

Labor market conditions reflect the price, quantity, and quality of contingent faculty available to educational institutions. An institution's geographic location, which in part determines local labor market conditions, may thus influence decisions about contingent employment. Institutions staffed with contingent employees must rely on a continual flow of qualified labor that is most likely to be accessible in metropolitan areas. Furthermore, because of the relative concentration of competent employees in large cities, organizations in urban areas have a greater ease in replacing critical skills; they are thus less dependent on employees' resources and are less likely to satisfy the employee's preference for full-time employment. Hence, employers and employees are more likely to reach agreements on contingent work arrangements in large cities and suburbs.

Hypothesis 3: Institutions that are located in major urban areas are likely to employ more part-time faculty.

Besides economic incentives, decisions about employment practices must respond to the interests of powerful external actors such as governments (Pfeffer and Salancik 1978). Organizations that are highly dependent on governments are likely to manage their employee relationships by adopting practices that conform to the interests of governments. Colleges and universities, especially public ones, are carefully overseen or coordinated by state-wide higher education governing or coordinating boards on such important issues as employment policies and procedures. For example, state governing boards usually regulate the maximum teaching loads for part-time employees. In addition, governing boards at public institutions usually ratify decisions about contingent employment and wage rates. The activities of higher-level bureaucratic entities create pressures on public institutions' desires to pursue pure economic

efficiency. Consequently, public institutions that experience substantial governmental inspection may be less likely to employ contingent faculty in order to achieve greater bureaucratic legitimacy.

Hypothesis 4: Public institutions tend to hire fewer contingent faculty than private institutions do.

Organizational size may affect the use of faculty in two ways. Large organizations tend to be more highly bureaucratized and to deploy more bureaucratized employment practices than small organizations do (Pfeffer and Cohen 1984). According to bureaucratic control arguments advanced by Edwards (1979), organizations with bureaucratic employment practices seek competent, committed, and stable employees who are willing to follow rules and social practices. These organizations are less likely to hire contingent workers, who are often perceived as transient and less loyal. Furthermore, as large organizations develop more diverse positions and have more employees, they are able to reassign employees to different functions in the event of workload changes. Large institutions are thus less likely than small ones to hire contingent workers.

Hypothesis 5: Institutions with greater enrollment size tend to have a lower share of part-time faculty.

Not only size matters, but so does the mix of students with varied enrollment status. During the past several decades, the proportion of students who attend colleges and universities on a part-time basis has increased from about 30% in the 1960s to more than 40% after 2000 (NCES 2005). Part-time students are more likely to take evening and weekend classes than their full-time counterparts. Colleges and universities can increase the hours worked by regular faculty

or reschedule their working hours to accommodate this need, but such arrangements often cause job dissatisfaction among regular faculty which must be offset by premium payments. From this perspective, part-time faculty can be viewed as a relatively inexpensive expansion of the labor pool, enabling the institution to offer more evening and weekend classes to attract and serve the growing population of part-time students.

Hypothesis 6: Institutions with a large share of part-time students are more likely to employ a large share of part-time faculty.

Recent years have seen a significant increase in the importance of tuition revenues to institutions' financial well-being. For example, in public institutions, the share of total revenues that come from tuition and fees has increased from about 12% in early 1980s to 20% in recent years (NCES 2005, Table 329). To compete for student enrollment and maintain a robust tuition revenue stream, colleges and universities may seek to hire more contingent faculty to open more courses that cater to a diverse student population. Employing contingent faculty makes it possible to bring into the classroom experts from other professions, such as senior corporate executives, policy leaders, and performance artists. Such individuals are generally available on a part-time basis; they convey practical expertise, and provide a different set of experiences for students. Although these external experts have less contact with the university and students than full-time faculty do, they offer cost-effective and flexible teaching talent to the institution. Therefore, we expect that colleges and universities that rely more on tuition and fees revenues are more likely to earmark a significant share of their hiring resources to part-time faculty.

However, colleges and universities may choose different options and opportunities to utilize internal resources and external expertise in generating tuition revenues. The relative

importance of tuition revenue in decisions to hire contingent faculty may depend on an academic institution's quality. High-quality institutions employ a large pool of competent full-time faculty, and they are able to mobilize their in-house expertise to improve the quality of instruction or to increase new course offerings. In contrast, low-quality institutions with limited academic capabilities and resources may have a greater reliance on the teaching expertise of contingent faculty to generate more tuition revenue. Thus, we further hypothesize that institutional quality moderates the relationship between part-time faculty employment and level of tuition revenue.

Hypothesis 7: The employment of part-time faculty employment is positively related to the percentage of institutional revenues derived from tuition and fees.

Hypothesis 7a: The positive relationship between tuition revenue and part-time faculty employment is stronger when institutional quality is low. Conversely, the positive relationship between tuition revenues and part-time faculty employment is weaker when institutional quality is high.

Data, Variables, and Methods

Our data come from the Integrated Postsecondary Education Data System (IPEDS), which was the core postsecondary education data collection program for National Center for Educational Statistics (NCES). IPEDS consists of a series of interrelated survey components that are designed to collect information from different aspects of postsecondary educational institutions. These components include (a) institutional characteristics, (b) enrollments, (c) finance, (d) faculty salaries, (e) fall staff, and others. The universe of postsecondary education institutions, which consists about 7,000 U.S. colleges, universities, and other institutions, is divided into three categories based on the highest degree awarded: (a) baccalaureate or higher

degree-granting institutions; (b) two-year-degree-granting institutions; and (c) less-than-two-year institutions. The first category contains about 2,100 institutions consisting of general colleges and universities and specialized institutions such as theological seminaries, medical schools and centers, and separate health profession schools.

In this study, we limit our sample to general colleges and universities that grant baccalaureate or higher degrees, a total of 1,401 institutions for the academic year 2005-2006, which is the most recent year with most IPEDS survey components available. This particular group of institutions provides an ideal sample for the study of contingent employment in higher education. They have similar core education functions including teaching and research, which makes comparisons meaningful. At the same time, they are sufficiently heterogeneous in terms of their institutional missions and educational activities that differences in employment patterns emerge readily. The Carnegie Classification, the most popular classification matrix in higher education, categorizes these institutions into several subgroups based on the level and range of degrees each institution offers. These categories include (a) Doctoral/Research Institutions, (b) Comprehensive/Master's Institutions, and (c) Liberal Arts Colleges. (See Table 1 for specific criteria for each category.)

We excluded 41 of the 1,401 institutions because of missing values for the number of faculty, giving us a usable sample of 1,364 institutions. Of these institutions, 503 are state (or publicly) controlled and the remaining 861 are privately controlled. Among privately controlled institutions, 18 are for-profit institutions. We included these for-profit institutions in our analysis and tagged them separately in regression analyses. Excluding these institutions, however, did not result in noticeable changes in any analysis due to their small number. Table 1 presents the distribution of institutions by control and Carnegie Classification. This distribution does not

represent the distribution of faculty by control and Carnegie Classifications because institutions differ drastically in size.

Our main variable of interest is the level of contingent employment, measured by the proportion of part-time faculty among all faculty members at an institution. The number of faculty members by employment status is available in the IPEDS fall staff survey. For each institution in our sample, we extracted two variables: the number of full-time faculty and the number of part-time faculty. We calculated the proportion of part-time faculty as the division between the number of part-time faculty and the number of all faculty. This variable serves as the main dependent variable in our analyses.

For full-time faculty members, a separate IPEDS Faculty Salaries Survey reports data on the number of full-time faculty by rank (i.e., full professor, associate professor, assistant professor, full-time lecturers, and full-time instructors) and by contract length (i.e., 9/10-month and 11/12-month). We extracted the data on the weighted average salary of the equated nine-month contract (e.g., the salary for 11/12 month contract is scaled down by a factor of 0.8182) for all ranks of full-time faculty.³

Data on institutional revenues and expenditures are available in the IPEDS Finance Survey. For each institution, we drew two variables, namely, the total current revenues and the revenue from student tuition and fees. To measure how much an institution relies on student tuition and fees, we constructed the proportion of total revenues from tuition and fees for each institution. This variable is used in our analysis to test whether contingent employment reflects institutional resource dependence on revenues from tuition and fees.

³ We also used data on the average faculty salary for each rank in our analysis. Because the averages for different ranks are highly correlated with the overall average, we retain only the latter variable in our subsequent analysis.

To measure relative financial well-being across institutions, we need to consider institutional size as well. Institutional size is usually measured by full-time equivalent (FTE) student enrollment, which is also available in IPEDS Enrollment Survey. Again, we extracted two variables from that survey: the number of part-time students and the number of full-time students. We followed the convention of calculating FTE enrollment by adding one-third of the number of part-time students to the number of full-time students. We then divided the total current revenue by FTE enrollment to generate a new variable measuring the institution's relative financial well-being. We used this variable to test whether institutions with greater financial constraints are more likely to use contingent employment to reduce labor costs. These data further permitted us to compute the share of part-time student enrollment at each institution to test whether institutions use contingent faculty as a strategy to meet demand from an increasingly diverse student population.

Finally, we used the IPEDS Institutional Characteristic Survey to obtain information on the location and control of each institution. The physical address of each institution identifies its geographic status on an urban continuum ranging from large cities to rural areas. We created a dummy variable to indicate whether an institution is in an "urbanized" area (e.g., in or near a city with a population of 250,000 or more).⁴ In addition, based on information about the type of institutional control, we created three dummy variables: public, private not-for-profit, and private for-profit. Table 2 presents descriptive statistics of all variables used in this analysis. Information on how these variables are computed and what original institutional surveys are used is contained in Appendix Table A.

⁴ We also created a series of dummies to indicate whether an institution is located inside midsized cities (or suburbs), small cities (or suburbs), towns, or rural areas. Further analyses show no significant difference in contingent employment across these areas. As a result, only the dummy of large city (or suburb) is used in subsequent analyses.

Multiple regression is the basic method used in this analysis. On the left hand side is our main dependent variable: the proportion of part-time faculty. The list of independent variables contains various economic and institutional factors. The basic model is also extended in three ways. First, because institutions differ in size, the basic regression model is then weighted by the number of total faculty members to assign more weights to larger institutions. Second, to test whether institutions of differing quality adopt different strategies in improving their tuition revenue, we added an interaction term between the proportion of tuition revenue and the average salary of full-time faculty (which is a proxy for institutional quality) to the basic model. Finally, we estimated the basic model for institutions of different Carnegie Classifications to test whether the pattern of contingent employment shifts among different types of institutions.

Results

We first present some descriptive statistics. Table 1 reports the share of part-time faculty, both overall and broken down by control and type of institutions. Several general observations can be made based on these descriptive statistics. First, the variation of part-time faculty's share across different types of institutions is substantial, ranging from a low of 21.27% at Doctoral/Research Institutions I to a high of 51.55% at Comprehensive Institution I. In general, doctoral/research institutions employ the fewest part-time faculty members, while comprehensive institutions have the largest share of part-timers, especially at private comprehensive institutions. To a certain degree, our regression analysis attempts to explain these cross-institution variations in the share of part-time faculty by using a variety of independent variables.

Second, it appears that private institutions tend to employ more part-time faculty than their public counterparts. Overall, part-time faculty make up 42.97% (simple average, not weighted by the number of faculty) of all faculty at private institutions, while the share of part-time faculty is 31.33% at public institutions. The higher proportion of part-time faculty at private institutions not only holds on average but is also true in general for different Carnegie types of institutions. The only exception is that public Liberal Arts Colleges I have a slightly higher proportion of part-time faculty than their private counterparts. These observations are consistent with our hypothesis that private institutions tend to use more part-time faculty than public institutions; however, it is not clear at this stage whether this distinction still holds after a variety of other variables are controlled in regression models.

Third, it appears that contingent employment is negatively correlated with institutional quality. It is widely conceived that Doctoral/Research Institutions I and Liberal Arts Colleges I are viewed as institutions that attract students with highest test scores and that pay their faculty with highest salaries among all types of institutions. In fact, the simple correlation between the proportion of part-time faculty and the (log) average salary for full-time faculty is -0.23. On the other hand, institutions might be more motivated by savings in salaries realized by hiring more part-time faculty when they are already paying high salaries to their full-time faculty. Therefore, it is not immediately clear how the salary for full-time faculty would affect contingent employment once other variables are controlled.

Table 3 presents the OLS estimates of the impact of various factors on contingent employment. All independent variables enter into the regression equation simultaneously. Results from step-wise regressions are not reported here but are available upon request. The first economic and market factor in the model is the log average salary of full-time faculty. We find

that the share of part-time faculty is positively related to the salary level for full-time faculty. To be more specific, a 10% increase in the average salary that an institution pays its full-time faculty is associated with about a 1% increase in the proportion of part-time faculty at that institution, holding all other variables in the model constant. These estimated coefficients are statistically significant at 0.001 level. Hypothesis 1 is strongly supported.

The second economic and market factor is institutional revenue per FTE student. Regression results indicate that, *ceteris paribus*, the better the financial well-being, the lower the share of part-time faculty (Hypothesis 2). On average, a 10% increase in current revenues per FTE student at an institution is associated with about a 1% reduction in the share of part-time faculty at the same institution. This finding is evident of the effect of constraints of financial resources on the employment of contingent faculty.

Nonetheless, the ability of institutions to hire sufficient numbers of part-time faculty to reach a desired level is also part of the equation. Regression results indicate that institutions located in a large city or suburb tend to have a higher proportion of part-time faculty, thus supporting Hypothesis 3. Specifically, institutions located in cities or suburbs with a population of 250,000 or more tend to employ 6.2% more part-time faculty than similar institutions located in less urban areas, on average.

The above results suggest the significant impact of economic and market factors on contingent employment at colleges and universities. In addition, results indicate that institutional factors also exert a great influence on contingent employment in higher education institutions. The unweighted regressions suggest that private institutions tend to hire more part-time faculty than their public counterparts, even after controlling for other factors in the model. Specifically, the share of part-time faculty at private not-for-profit institutions is about 5.5% higher than at

public institutions, while the gap between private for-profit and public institutions is larger-- about 10%. These results in general support our hypothesis that public institutions are more likely to be constrained by state regulations in all aspects of institutional operation. At the other extreme of the spectrum, it appears that private for-profit institutions have the greatest incentives to use part-time faculty, probably due to their for-profit characteristics. (It will become evident soon in subsequent analyses that the difference in the employment level of part-time faculty between private and public institutions varies across different Carnegie categories of institutions.)

The practice of contingent employment is also significantly influenced by students, who constitute the “customers” of higher education institutions. Larger student enrollment is associated with a lower proportion of part-time faculty. In addition, student mix in terms of attendance status has a significant impact on contingent employment. A 10% increase in the share of students who attend colleges and universities part-time is associated with a more than 4% increase in the share of faculty who teach part-time. This evidence strongly supports the hypothesis that contingent employment could be a business strategy adopted by higher education institutions to align their products with consumer needs.

The last variable in our regression further confirms that contingent employment reflects the strategic effort of colleges and universities to serve the needs of their customers as a means of securing their revenue streams. On average, a 10% increase in the share of total revenues that come from student tuition and fees is associated with a 2% increase in the share of part-time faculty whose main responsibility is teaching. We tested whether institutions adopt different strategies to attract student enrollment—more specifically, whether high-quality institutions focus more on the quality of their instruction by employing more full-time faculty while low-quality institutions focus more on the diversity and flexibility of their curricula to attract more

enrollment. We estimated the model with an interaction term between the proportion of tuition revenue and full-time faculty salary. Here the average full-time faculty salary serves as a proxy for institutional quality. Results presented in the second column of Table 3 confirm our hypotheses. The negative coefficient for the interaction term indicates that the positive correlation between tuition revenue and contingent employment is much stronger at low-quality institutions than at high-quality institutions, suggesting that institutions have employed different strategies to attract students and maintain a stable revenue stream.

It is noteworthy that these independent variables in Table 3 seem to predict the cross-group differences in contingent employment quite accurately. That is, Table 1 displays a significant difference among groups of institutions. To test whether these differences are explained by these economic and institutional factors included in our empirical model, we expanded our basic model by including dummy variables indicating different Carnegie categories of institutions. This expanded model did not detect any significant difference among Carnegie categories after controlling for other variables in the model.

Table 4 is similar to Table 3, except that regressions in Table 4 are weighted by the number of total faculty at each institution. These two tables yield similar qualitative results, although the magnitude of individual coefficients changes slightly. For example, the estimated coefficient for the (log) average salary of full-time faculty is 0.1089 in Table 3, but it 0.1317 in Table 4. In some cases, the significance level also changes. For example, results in Table 3 suggest that private institutions, whether they are for-profit or not, tend to employ more part-time faculty than their public counterparts. These differences do not appear to remain significant in Table 4.

Intuitively, because institutions of large size are given more weight in the weighted regression, results reported in Table 4 are heavily influenced by the relationship between contingent employment and various independent variables at larger institutions, especially doctoral/research and comprehensive institutions, if these relationships are not homogenous across groups. To confirm this point, we ran separate regressions for different Carnegie categories of institutions. The results are presented in Table 5. (The weighted version of Table 5 is reported in Appendix Table B.) Most of the qualitative results generated from the pooled regression still hold for individual groups of institutions. For example, the share of part-time faculty is positively related to the average salary of full-time faculty, the location of an institution in large cities or suburbs, the share of students who attend colleges on a part-time basis, and the proportion of total institutional revenues that come from student tuition and fees. Further, the share of part-time faculty in general is negatively related to the average revenue per FTE student and the number of FTE student enrollment.

Important differences do emerge from breaking out the analysis by different types of institutions. As expected, these differences speak to the differences in the estimated coefficients in Table 3 and 4. For example, the estimated effect of the (log) average salary of full-time faculty on contingent is much higher at doctoral/research and comprehensive institutions than at liberal arts institutions. As a result, the estimated effect for this variable in the pooled weighted regression is larger than that in the unweighted regression where doctoral/research and comprehensive institutions are assigned with the same weight as liberal arts institutions. The level of revenue per FTE student appears to matter more for comprehensive institutions and liberal arts colleges than for doctoral/research institutions. Interestingly, among doctoral/research institutions, private institutions do not seem to have more part-time faculty than public

institutions once other variables are controlled. In fact, the estimated effects are negative, although not statistically significant. The largest gap between public and private institutions in terms of the share of part-time faculty occurs at liberal arts institutions. Finally, the mix of students in terms of their attendance status has a very strong relationship with contingent employment for all institutions. And the proportion of tuition and fees revenues seems to affect contingent employment at research and doctoral institutions more than other types of institutions.

Discussion and Conclusions

Our analysis uses a cross-section sample of four-year colleges and universities in the United States to examine the variation of contingent employment in core positions of these institutions. Results of this study supported the arguments of ILM theory that higher educational institutions actively design and adopt contingent work arrangements to save on labor costs and to manage their resource dependence with constituencies. Institutions that pay high salaries to their full-time faculty members, have limited resource slack, and are located in major urban areas tend to employ a high proportion of part-time faculty. Furthermore, institutions that have small student enrollment and large proportion of part-time students are found to rely more heavily on part-time faculty employment. Private institutions, on average, have higher levels of part-time faculty than their public counterparts; however, this result does not hold for doctoral/research institutions. Finally, institutions that rely more on tuition and fees revenue tend to employ more part-time faculty. Such a relationship is significantly moderated by institutional quality, suggesting that different institutions may adopt different strategies to attract students and secure their tuition revenue.

There are limitations in attempting to establish causal relationship among various economic and institutional factors and contingent employment at colleges and universities. These relationships may reflect differences in historical contexts, socio-geographic locations, and institutional goals. For example, selective research institutions (e.g., Ivy League institutions) usually enjoy more financial resources and have a lower proportion of part-time students; at the same time, they tend to have a lower proportion of part-time faculty. In some cases, contingent employment might be interpreted as the “cause” but not the “consequence.” For example, it could be argued that, by using a higher proportion of contingent employees, institutions are able to pay their full-time faculty better. Consequently, it might be more appropriate to view our findings as empirical associations between various economic and institutional factors and contingent employment at colleges and universities.

This analysis extends the ongoing research on employment relations in several directions. First, part-time faculty are core production workers, yet their employment is contingent. While much ongoing research focuses on employees in contingent jobs and hence provides important perspectives in understanding the differences between core and peripheral jobs, the current analysis extends this line of research by focusing on contingent employees in core jobs. Second, this analysis extends the discussion of contingent employment to not-for-profit organizations by focusing on colleges and universities. Studying part-time employment in the public sector contributes to a more complete analysis of contingent employment and the changing forms of internal labor markets. Third, economic and institutional considerations that derive contingent employment are often separately theorized and tested. By incorporating a wide array of both factors, this study suggests that the organizational choice of contingent employment is heavily influenced by a host of institutional and environmental factors.

Not addressed in current analysis is the potential impact of contingent employment on organizational performance. If contingent employees are as competent as full-time employees in core jobs⁵—and are much cheaper than full-time employees—they may pose a real challenge to full-time employees especially tenured and tenure-track faculty at colleges and universities. There has been some evidence that new faculty members at four-year colleges and universities in the United States are increasingly appointed to non-tenure-track positions (Ehrenberg and Zhang 2005) and that the real wage for full-time faculty has been stagnant for almost three decades (Ehrenberg 2004, Table A). Whether this is only coincidence or whether it represents a pattern of workforce restructuring awaits more research.

Finally, this study examines the employment of part-time faculty versus full-time faculty. However, full-time faculty are growing into a diverse group in recent years. The compensations for full-time professorial faculty and full-time lecturers are quite different. For example, in academic year 2005-2006, the average salary of full-time lecturers nationwide at two- and four-year colleges and universities was \$40,952, while the average salary of assistant professors at these institutions (most of whom are on tenure-tracks) was \$56,298 (Thornton 2006). In other words, an institution would save, on average, \$15,346, or 27.3%, by filling a faculty slot with an instructor instead of an assistant professor. Much remains to be learned about the changing practice of faculty employment in higher education institutions.

⁵ A few studies have examined the effectiveness of part-time faculty (e.g., Gappa and Leslie 1993); however, evidence is mixed at best.

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Table 1: Proportion of part-time faculty, by control and types of institutions

Carnegie Classification	Public Institutions		Private Institutions	
	Number	Proportion	Number	Proportion
Doctoral/Research Institutions I	102	21.27%	49	26.31%
Doctoral/Research Institutions II	63	29.13%	43	45.73%
Comprehensive Institutions I	242	34.69%	240	51.55%
Comprehensive Institutions II	22	35.60%	85	50.42%
Liberal Arts Colleges I	25	31.81%	195	30.35%
Liberal Arts Colleges II	49	36.36%	249	44.85%
Total (unweighted)	503	31.33%	861	42.97%

Note:

The Carnegie Classification includes all colleges and universities in the United States that are degree-granting and accredited by an agency recognized by the U.S. Secretary of Education.

1. Doctoral/Research Institutions I: These institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the doctorate. They award 50 or more doctoral degrees per year in at least 15 disciplines.
2. Doctoral/Research Institutions II: Similar to doctoral/research I; however, they award at least 10 doctoral degrees per year across three or more disciplines, or at least 20 doctoral degrees per year overall.
3. Comprehensive Institutions I: These institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the master's degree. They award 40 or more master's degrees per year in three or more disciplines.
4. Comprehensive Institutions II: Similar to comprehensive institutions I; however, they award 20 or more master's degrees per year.
5. Liberal Arts Colleges I: These institutions are primarily undergraduate colleges with major emphasis on baccalaureate programs. They award at least half of their baccalaureate degrees in liberal arts fields.
6. Liberal Arts Colleges II: Similar to Liberal Arts Colleges I; however, they award less than half of their baccalaureate degrees in liberal arts fields.

Table 2: Descriptive Statistics of Main Variables and Hypothesized Relationships with Contingent Employment

Variable	Mean	Std. Dev.	Hypoth'd Direction
<i>Dependent variable:</i>			
Proportion of faculty who are part time	0.3868	0.2117	
<i>Economic/Market factors:</i>			
Log average salary of full-time faculty	10.9295	0.3897	+
Log revenue per full-time equivalent student	9.8883	0.6027	-
College in city/suburb with population \geq 250K (dummy)	0.3526	0.4780	+
<i>Institutional factors:</i>			
Public institution (dummy)	0.3654	0.4817	
Private non-for-profit institution (dummy)	0.6217	0.4851	+
Private for-profit institution (dummy)	0.0128	0.1127	+
Log number of full-time equivalent students	8.0176	1.1235	-
Proportion of students who are enrolled part time	0.2364	0.1725	+
Proportion of total revenue from tuition and fees	0.4769	0.2469	?

Table 3: Determinants of Part-time Employment at Colleges and Universities (unweighted)

Independent variables	Model 1		Model 2	
	Coeff.	t-value	Coeff.	t-value
Constant	0.1344	0.56	-0.7221	-1.50
<i>Economic/market factors:</i>				
Log average salary of full-time faculty	0.1089	3.71	0.1993	3.77
Log revenue per FTE student	-0.1001	-8.26	-0.1107	-8.42
College located in big city/suburb	0.0616	6.11	0.0616	6.11
<i>Institutional factors:</i>				
Private non-for-profit institutions	0.0551	3.09	0.0585	3.27
Private for-profit institutions	0.0985	2.17	0.0871	1.90
Log number of FTE students	-0.0250	-4.00	-0.0283	-4.40
Proportion of part-time students	0.4041	13.70	0.4068	13.79
Proportion of tuition and fees revenue	0.2024	6.19	1.7924	2.32
Prop. tuition revenue * Log FT fac salary			-0.1465	-2.06
Number of observations	1340		1340	
R-squared	0.4332		0.4350	

Table 4: Determinants of Part-time Employment at Colleges and Universities (weighted)

Independent variables	Model 1		Model 2	
	Coeff.	t-value	Coeff.	t-value
Constant	-0.5175	-2.13	-2.0366	-5.25
<i>Economic/market factors:</i>				
Log average salary of full-time faculty	0.1317	4.70	0.2863	6.88
Log revenue per FTE student	-0.0614	-6.61	-0.0774	-7.94
College located in big city/suburb	0.0433	5.49	0.0463	5.90
<i>Institutional factors:</i>				
Private non-for-profit institutions	0.0143	1.02	0.0073	0.52
Private for-profit institutions	0.0773	1.51	0.0315	0.61
Log number of FTE students	-0.0272	-4.92	-0.0311	-5.62
Proportion of part-time students	0.4582	16.87	0.4573	16.98
Proportion of tuition and fees revenue	0.3739	12.39	3.8072	5.53
Prop. tuition revenue * Log FT fac salary			-0.3107	-4.99
Number of observations	1340		1340	
R-squared	0.6247		0.6316	

Table 5: Determinants of Part-time Employment, by Types of Institutions (unweighted)

Independent variables	Research/Doctoral		Comprehensive		Liberal Arts	
	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value
Constant	-1.3561	-2.64	-0.2985	-0.63	0.8769	2.45
<i>Economic/market factors:</i>						
Log average salary of full-time faculty	0.1548	2.80	0.1826	3.46	0.0378	0.80
Log revenue per FTE student	-0.0255	-1.22	-0.1255	-4.57	-0.1057	-5.14
College located in big city/suburb	0.0299	1.82	0.0599	3.43	0.0754	4.68
<i>Institutional factors:</i>						
Private non-for-profit institutions	-0.0066	-0.24	0.0303	0.83	0.0860	3.05
Private for-profit institutions	-0.1236	-1.40	0.1117	1.37	0.1914	2.69
Log number of FTE students	-0.0091	-0.75	-0.0387	-2.85	-0.0147	-1.12
Proportion of part-time students	0.3997	5.79	0.3473	7.08	0.4893	9.22
Proportion of tuition & fees revenue	0.4700	6.87	0.2380	3.48	0.1349	3.12
Number of observations	254		578		508	
R-squared	0.5799		0.3419		0.4227	

Appendix Table A: Explanation for Main Variables and Data Sources

Variable	IPEDS Survey
<i>Dependent variable:</i>	
(1) Proportion of faculty who are part time	Fall Staff
<i>Economic/Market factors:</i>	
(2) Log average salary of full-time faculty	Salaries
(3) Log revenue per full-time equivalent student	Finance; Enrollment
(4) College in city/suburb with population \geq 250K (dummy)	Institutional Characteristics
<i>Institutional factors:</i>	
(5) Public institution (dummy)	Institutional Characteristics
(6) Private non-for-profit institution (dummy)	Institutional Characteristics
(7) Private for-profit institution (dummy)	Institutional Characteristics
(8) Log number of full-time equivalent students	Enrollment
(9) Proportion of students who are enrolled part time	Enrollment
(10) Proportion of total revenue from tuition and fees	Finance

Notes:

1. Proportion of faculty who are part-time: The number of part-time faculty divided by the number of all faculty which include full-time tenured and tenure-track faculty, full-time off-track faculty, and part-time faculty.
2. Log average salary of full-time faculty: The logarithm of the weighted average salary of all full-time faculty which include full-time tenured and tenure-track faculty and full-time off-track faculty.
3. Log revenue per full-time equivalent (FTE) student: FTE student is calculated as the number of full-time students plus one-third of the number of part-time students. The total institutional current revenue is then divided by the number of FTE enrollment before taking the logarithm
4. College in city/suburb with population \geq 250K: A dummy variable indicating that an institution is located in an urbanized area (in or near a principal city with population 250,000 or more).
5. Public institution: A dummy variable indicating that an institution is publicly controlled. This category serves as the base category in all regression analyses.
6. Private not-for-profit institution: A dummy variable indicating that an institution is private, not-for-profit.
7. Private for-profit institution: A dummy variable indicating that an institution is private, for-profit.
8. Log number of full-time equivalent students: The logarithm of the number of FTE enrollment, defined in note 3.
9. Proportion of students who are enrolled part-time: The number of part-time students divided by the number of all students including full-time and part-time students.
10. Proportion of total revenue from tuition and fees: The tuition and fees revenue divided by total current revenue at an institution.

Appendix Table B: Determinants of Part-time Employment, by Types of Institutions (weighted)

Independent variables	Research/Doctoral		Comprehensive		Liberal Arts	
	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value
Constant	-1.1321	-2.16	-0.6093	-1.36	0.9734	2.81
<i>Economic/market factors:</i>						
Log average salary of full-time faculty	0.1376	2.35	0.1916	3.77	0.0335	0.73
Log revenue per FTE student	-0.0061	-0.32	-0.1441	-5.49	-0.1107	-5.47
College located in big city/suburb	0.0439	3.05	0.0343	2.35	0.0845	6.13
<i>Institutional factors:</i>						
Private not-for-profit institutions	-0.0451	-1.86	0.0722	2.25	0.0718	2.64
Private for-profit institutions	0.2240	1.72	0.0313	0.38	0.1410	2.19
Log number of FTE students	-0.0318	-2.31	0.0002	0.01	-0.0144	-1.10
Proportion of part-time students	0.3007	4.73	0.5598	13.32	0.5356	10.65
Proportion of tuition and fees revenue	0.5372	8.35	0.2886	4.81	0.1763	4.06
Number of Observations	254		578		508	
R-squared	0.5870		0.5392		0.5507	