

## American Higher Education in Transition<sup>†</sup>

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**A**merican higher education is in transition along many dimensions: tuition levels, faculty composition, expenditure allocation, pedagogy, technology, and more.

During the last three decades, at private four-year academic institutions, undergraduate tuition levels increased each year on average by 3.5 percent more than the rate of inflation. The comparable increases for public four-year and public two-year institutions were 5.1 percent and 3.5 percent, respectively (Baum and Ma 2011, figure 4). Tuition increases in private higher education have been associated over this period with increased real expenditures per student. In public higher education, as I detail below, at best, tuition increases have helped to compensate for reductions in state support (Desrouchers, Lenihan, and Wellman 2010).

The forces that cause private and public tuitions to increase at rates that exceed the rate of inflation have been extensively discussed in Ehrenberg (2002, 2006, 2007, 2010) and Archibald and Feldman (2011). They include the aspirations of academic institutions to be the very best they can be in every dimension of their activity. Also important are student and parent perceptions that where one goes to college is almost as important as whether one goes to college and the belief that higher-priced selective private institutions confer unique educational and economic advantages on their students; this leads higher-priced, selective private institutions to have long lines of applicants and only limited market forces to limit their tuition

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<sup>†</sup> To access the Appendix, visit <http://dx.doi.org/10.1257/jep.26.1.193>.  
doi=10.1257/jep.26.1.193

increases, which in turn provides cover for less-selective institutions to raise their tuition levels.<sup>1</sup> Higher education is also driven by published rankings, such as those of *U.S. News and World Report*, which are based partially on institutions' expenditures per student. Finally, the growth of technology can lead to improvements in the quality of higher education but often comes at a high cost. For public institutions, add to these pressures the cutbacks in state support.

Even as undergraduate tuition levels and spending per student are increasing, the nature of faculty positions has changed dramatically during the last 30 to 40 years. The percentage of faculty nationwide that is full-time has declined from almost 80 percent since 1970, to 51.3 percent in 2007, and the vast majority of part-time faculty members do not have Ph.D.s (Snyder and Dillow 2010, tables 249, 253). The percentage of full-time faculty not on tenure track has more than doubled between 1975 and 2007, increasing from 18.6 percent to 37.2 percent (AAUP Fact Sheet, n.d.). Of course, this change raises the question of whether, or how much, different types of undergraduates benefit from being taught by full-time tenured or tenure-track faculty.

Part of the reason for a rise in tuition at the same time as what appears to be a decline in spending on faculty is that the *tuition discount rate*—the share of each tuition dollar that institutions returned to their undergraduate students in the form of need-based or merit grant aid—increased substantially at private four-year institutions. For example, the average tuition discount rate for first-time, full-time, first-year students at private four-year institutions reached 42 percent in fall 2008; in fall 1990, the comparable figure was 26.7 percent (National Association of College and University Business Officers 2009, 2010). In short, much of the increase in tuition revenues at private colleges and universities has been plowed back into undergraduate aid; at all but a handful of the very wealthiest private institutions, the vast majority of undergraduate financial aid dollars come from tuition revenue.<sup>2</sup> The wealthiest and most selective private institutions of higher education dramatically increased the generosity of their financial aid policies for several reasons: relatively small fractions of their students were coming from lower-income and lower-middle-income families (Supiano and Fuller 2011), and the institutions wanted to attract

<sup>1</sup> That selective institutions provide students with unique advantages is disputed, with most studies, including Brewer, Eide, and Ehrenberg (1999), finding it to be true, while two other studies, Dale and Kruger (2002, 2011), offer contrary evidence.

<sup>2</sup> A different, but important, question is how the *net tuition cost* paid by the average student has changed over time. In addition to institutional grant aid, net tuition calculations adjust posted tuition rates for federal, state, and other private grant aid and for tax credits for educational expenses. The College Board reports that while average tuition levels at public and private not-for-profit four-year institutions grew by average annual rates of 7.0 and 5.3 percent, respectively, during the 1990–91 to 2011–12 period, *net tuition* at the two types of institutions grew at lower annual rates of 4.1 and 3.4 percent, respectively, during the period. Average tuition levels grew at average annual rate of 0.6 percent per year at public two-year colleges during the period, but net tuition actually declined at them, largely due to increases in the generosity of the federal Pell Grant program (unpublished data from the College Board provided by Sandy Baum). For comparison purposes, the average annual rate of increase in the Consumer Price Index during the 1990 to 2010 period was about 2.7 percent.

these students; a combination of rapid growth rates in their endowments during much of the period and relatively low endowment spending rates led to pressure from the U.S. Congress for them to increase endowment spending on financial aid; and, after the financial collapse in 2008, the decline in family incomes and asset levels meant dramatic increases in the financial need of their applicants. Other less-selective private institutions, which face highly salient competition from lower-priced public institutions, also faced a dramatic need to increase grant aid and offer tuition discounts both to fill all their seats and to achieve desired class composition in terms of student selectivity and other characteristics.<sup>3</sup>

In public higher education, tuition increases in recent decades have barely offset a long-run decline in state appropriations per full-time equivalent student. State appropriations per full-time equivalent student at public higher educational institutions averaged \$6,454 in fiscal year 2010; at its peak in fiscal year 1987, the comparable number (in constant dollars) was \$7,993 (State Higher Education Executive Officers 2011, figure 3), translating into a decline of 19 percent over the period. Even if one leaves out the “Great Recession,” real state appropriations per full-time equivalent student were still lower in fiscal year 2008 than they were 20 years earlier. Overall, the sum of net tuition revenue and state appropriations per full-time equivalent student at the publics was roughly the same in real terms in fiscal year 2010 as it was in fiscal year 1987.

In addition, academic institutions have changed how they allocate their resources. The share of institutional expenditures going to faculty salaries and benefits in both public and private institutions has fallen relative to the share going to nonfaculty uses like student services, academic support, and institutional support (Desrochers, Lenihan, and Wellman 2010). This change has been accompanied by changing modes of instruction, together with different uses of technology—and in a number of schools by charging differential tuition across students.

This paper discusses these changes in faculty composition, expenditure allocation, pedagogy, technology, and differential tuition, how they are distributed across higher education sectors, and their implications. I conclude with some speculations about the future of American education.

## **The Changing Nature of the Faculty**

The composition of the faculty in institutions of higher education has evolved in two ways: Ph.D.s have become more widespread among the full-time faculty across all types of institutions, but there has been a move away from full-time and tenure-track jobs.

<sup>3</sup> While tuition levels rose in percentage terms by more at the four-year publics than they did at the four-year privates during the period, because tuition levels were so much lower at the publics at the start of the period, dollar increases in tuition were much larger at the privates, and the difference between public and private tuition levels (in real terms) increased during the period.

**Table 1**  
**Changing Faculty Types**

Category (sample size)	Full-time, non-tenure-track faculty as a percentage of all full-time faculty (A)			Part-time faculty as a percentage of all faculty (B)		
	1995	2001	2007	1995	2001	2007
<b>Associate's</b>						
Public (899)	38.4	39.4	43.1	64.7	67.0	68.9
Private not-for-profit (51)	74.3	75.4	82.5	52.3	50.4	56.1
Private for-profit (101)	98.7	90.0	97.7	49.0	51.0	57.7
<b>Bachelor's</b>						
Public (139)	17.1	22.9	23.4	39.6	42.2	43.7
Private not-for-profit (497)	22.2	26.9	30.8	33.1	37.4	41.7
Private for-profit (33)	79.6	91.9	90.6	57.9	64.9	78.6
<b>Master's</b>						
Public (261)	12.7	17.6	20.6	29.3	37.0	40.3
Private not-for-profit (332)	25.1	28.6	33.6	50.8	53.3	59.5
Private for-profit (17)	71.6	85.2	93.7	62.2	70.8	89.7
<b>Doctoral</b>						
Public doctoral (166)	24.4	32.1	35.2	19.7	22.5	24.0
Private not-for-profit (106)	18.2	35.4	46.2	32.2	34.9	31.7
Private for-profit (4)	98.3	100.0	100.0	44.8	72.3	84.0

*Source:* Author's calculations based on data for 2,606 institutions that reported information to the Integrated Postsecondary Education Data System (IPEDS) *Fall Staff Surveys* in all of the years.

*Note:* In this table, and several others that follow, institutions classified as "associate's" typically offer two-year degrees as the highest degree; those classified as "bachelor's" offer primarily bachelor's degrees; those classified as "master's" typically offer undergraduate and master's degrees; and those classified as "doctoral" typically offer a wide range of undergraduate and graduate degrees including doctoral degrees.

On the spread of Ph.D.s, the best historical data is collected annually by the American Mathematical Society (and is available at <http://www.ams.org/profession/data/annual-survey/annual-survey>). Between 1967 and 2009, the share of full-time mathematics faculty with a Ph.D. remained constant at about 90 percent at departments that offered doctoral degrees, but rose from 40 to 80 percent at those whose highest degree offered was a master's degree and from 30 to 70 percent at departments whose highest degree offered was a bachelor's degree, with most of the increase in the latter two types of institutions occurring by the mid-1980s (Ehrenberg 2011, figure 4.1). Assuming that mathematics was typical of many other academic disciplines, a growing supply of Ph.D.s allowed the bachelor's and master's institutions to increase the shares of their full-time faculty members with Ph.D.s.

Columns A of Table 1 present information on the percentages of full-time faculty members that are not on tenure tracks, by institutional type, for 1995, 2001, and 2007. In this table, and several others that follow, institutions classified as "associate's" typically offer two-year degrees as the highest degree; those classified as "bachelor's" offer primarily bachelor's degrees; those classified as "master's" typically

offer undergraduate and master's degrees; and those classified as "doctoral" typically offer a wide range of undergraduate and graduate degrees including doctoral degrees. The data are for a set of 2,606 institutions that reported information to the Integrated Postsecondary Education Data System (IPEDS) *Fall Staff Surveys* in all of the years.

During the period, the percentages of full-time faculty members that were not on tenure tracks increased at all categories of institutions, with the largest absolute increase occurring at private not-for-profit doctoral institutions. As the research intensity of doctoral institutions increased over time, more of the undergraduate instruction at these institutions is being undertaken by full-time, non-tenure-track faculty. I will discuss this pattern further below. The percentages of full-time faculty members not on tenure tracks are very high at all categories of for-profit institutions.

Columns B of Table 1 present similar information on the percentages of all faculty members who are part-time. The part-time percentage grew at all categories of institutions, save for the private, not-for-profit doctoral institutions. In many categories the growth was relatively modest over the time frame shown here, with the greatest growth occurring in the growing for-profit higher education sector. The vast majority of part-time faculty do not have doctoral degrees (Ehrenberg 2011, table 4.4).

Data on the changes that have occurred specifically in departments of economics are more limited. The American Economic Association's annual survey of economics departments collects information on faculty types and data for a matched sample of 59 institutions offering Ph.D.s and 86 institutions where bachelor's degrees are the highest offered. Data for academic years 1998–99 and 2008–2009 appear in Scott and Siegfried (2009). During this ten-year period, the percentages of full-time faculty that were not on tenure tracks in the AEA sample increased from 4.3 to 8.7 percent in the economics departments of Ph.D. institutions, and from 7.5 to 13.8 percent in economics departments of the bachelor's institutions; the percentages of faculty that were part-time increased at the same institutions from 3.9 to 7.9 and from 6.5 to 11.9 percent, respectively (Scott and Siegfried, table 5, panel C).

To confirm these results, which after all are based on a limited number of institutions, I put a couple of research assistants to work in February 2011 looking at the web pages of the faculty employed at institutions ranked by *U.S. News & World Reports*: in particular, the top 83 ranked Ph.D. programs in economics, the economics departments at the top 189 national liberal arts colleges, and the economics departments at the top 107 regional master's institutions.<sup>4</sup> They calculated the number of full-time faculty members that are tenured or on tenure track, the number of full-time faculty that are not on tenure track, and the number of full-time faculty that are visitors at each institution. In these calculations, instructors, lecturers, senior lecturers, clinical professors, professors of practice, and visiting

<sup>4</sup>Some of the departments at master's institutions are departments of "economics and . . ." In these cases, wherever possible, the tabulations were limited to faculty who were teaching economics.

Table 2

**Full-Time Faculty in Economics Departments that Are Non-Tenure-Track or Visitors with Professorial Titles***(for top Ph.D. programs in economics, and top national liberal arts colleges and regional master's institutions as defined by U.S. News & World Report)*

	<i>Non-tenure-track</i>		<i>Visitors with professorial titles</i>	
	<i>Mean percentage</i>	<i>(Mean percentages weighted by faculty size)</i>	<i>Mean percentage</i>	<i>(Mean percentages weighted by faculty size)</i>
Top 83 Ph.D. programs in economics	13.8	(15.0)	9.2	(9.5)
a) Top 25	13.1	(13.9)	15.9	(16.0)
b) Rank 27–50	15.4	(16.6)	5.9	(6.1)
c) Rank 54–83	13.0	(18.7)	6.4	(5.2)
Economics departments at the top 189 national liberal arts colleges	6.0	(6.5)	4.8	(6.6)
a) Top 50	6.6	(7.3)	11.6	(10.3)
b) Rank 51–100	5.7	(5.1)	3.8	(4.4)
c) Rank 101–189	5.8	(6.3)	1.0	(0.8)
Economics departments at the top 107 regional master's institutions	8.3	(11.8)	3.0	(3.6)

*Source:* Author's calculations from faculty data on departmental web pages in February 2011.

*Notes:* Faculty classified as non-tenure-track include lecturers, instructors, visiting lecturers, visiting instructors and faculty with titles such as professor of practice or clinical professor. Percentage "Non-tenure-track" are: Non-tenure-track faculty / (Tenured or tenure-track faculty + Non-tenure-track faculty). Percentage "Visitors with professorial titles" are: Visitors with professorial titles / (Tenured or tenure-track faculty + Non-tenure-track faculty).

instructors were counted as "not on tenure track." A separate tabulation looked at faculty with visiting professorial titles, because, especially at the major doctoral universities and selective liberal arts colleges, visitors may be tenured or on tenure tracks at other institutions. The research assistants then summarized the numbers over all of the departments in a category and computed the means (weighted by faculty size) across departments of the percentages of full-time faculty that are not on tenure track, excluding visitors other than visiting instructors. They also calculated the percentages of all full-time faculty that are visitors with professorial rank. These percentages appear in Table 2.<sup>5</sup>

The mean percentage of full-time economics faculty (excluding visitors with professorial ranks) that are *not* on tenure tracks is 13.8 percent for the top 83 Ph.D. programs, while the weighted (by faculty size) mean is 15.0 percent; both of these measures are higher than the comparable implied percentage found by Scott

<sup>5</sup> These calculations may understate the percentage of non-tenure-track faculty because some faculty with professorial ranks may not be on tenure tracks in these departments. Departmental web pages did not uniformly list all part-time faculty members so we could not tabulate information for this group.

and Siegfried (2009). The mean percentage of full-time visiting faculty in these departments is around 9 percent. Visiting professors make up a much greater share (around 16 percent) of the faculty at top 25 ranked economics departments, probably because tenured and tenure-track faculty from other leading departments often visit for research purposes.

The percentage of full-time economics faculty that are not on tenure tracks at top liberal arts colleges is around 6 percent; somewhat lower than Scott and Siegfried (2009) found. Visiting faculty members are much more prevalent in economics departments at the top 50 liberal arts colleges than they are at the other national liberal arts colleges. Finally, the mean percentage of full-time economics faculty members that are not on tenure tracks at top regional master's institutions is 8.3 percent and the weighted mean is 11.8 percent. Visiting professors are scarcer at these master's institutions relative to the other categories of institutions.

A final source of data on economics faculty comes from the annual reports of the Committee on the Status of Women in the Economics Profession (CSWEP). These reports provide data for a larger sample of Ph.D.-granting departments and liberal arts colleges than the AEA data, because of the persistence of CSWEP members in making contacts at each department. For example, the 2010 CSWEP report was based on data from 121 Ph.D.-granting institutions and 97 liberal arts institutions. The CSWEP data indicate that the percentage of full-time faculty that were not on tenure tracks at economics departments rose from 10.8 to 20.0 at the Ph.D. institutions and from 15.0 to 16.4 at the liberal arts institutions between 2005 and 2010.<sup>6</sup> Some care must be used in interpreting these numbers because the responding institutions vary between the two years and the CSWEP data do not separate out visiting faculty and other non-tenure-track faculty. But they do confirm that the usage of full-time, non-tenure-track faculty has been increasing at the doctoral universities. In these data, 33 percent of the non-tenure-track faculty in economics were female at the Ph.D. institutions in 2010; the comparable female share of tenure-track assistant professors at these institutions was 27.6 percent. I will speculate below that the greater share of non-tenure-track faculty members that is female is due to the difficulty that some female economists face in trying to combine tenure-track research careers and families at research universities.

### **Does the Falling Proportion of Tenured and Tenure-Track Faculty Matter?**

A traditional argument for the importance of a tenure system for faculty is based upon academic freedom. Absent tenure, and the job security it provides, faculty members may be reluctant to pursue research on controversial issues. The importance of this rationale for tenure was brought home to me personally in the late 1970s

<sup>6</sup> Author's calculations from data in Tables 3 and 4 of the 2010 and Tables 2 and 5 of the 2005 CSWEP reports, available on the web at ([http://www.aeaweb.org/committees/cswep/annual\\_reports.php](http://www.aeaweb.org/committees/cswep/annual_reports.php)).

when several trustees at my own institution challenged my promotion to professor because they disagreed with testimony I had given in a regulatory proceeding in the state of New York (as described in Ehrenberg 2002, p. 127). The Cornell Trustees shortly thereafter took the position, repeatedly affirmed, that the final decisions on tenure are to be made by the President and Provost of Cornell, with the Trustees only pro forma approving the decisions.

Economists have developed other arguments in support of tenure systems. One is that because a tenure system provides senior faculty with job security, they have an incentive to share their expertise with junior colleagues and students without creating competitors who will challenge their position; in this way, tenure facilitates the intergenerational transmission and expansion of knowledge (Stigler 1984). Another is that a tenure system can be thought of as an implicit long-term contract model, or a winner-take-all tournament model, and that both of these models can provide incentives for all faculty members to work harder (in the case of the contract model throughout the career; in the case of the tournament model, during the years prior to tenure and then to full professor) than would otherwise be the case (Lazear 1979; Rosen and Lazear 1981). In addition, a traditional labor economics argument holds that tenure is a desirable job characteristic and, in the absence of a tenure system, academic institutions would have to pay higher salaries to attract faculty. Indeed, in Ehrenberg, Pieper, and Willis (1999), my coauthors and I found that, *ceteris paribus*, economics departments that offer lower probabilities of tenure have to pay higher starting salaries to attract new faculty. A final argument is that if it is desirable for academics to specialize in their research in certain narrow subject areas, they need the reassurance of a reasonable probability of receiving tenure, because otherwise their specialization puts them at risk of having few alternative career options.

However, these arguments taken as a group seem to apply more to the role of faculty in research and institutional governance, rather than teaching. Is anything lost if undergraduate students are largely taught by adjuncts or full-time, non-tenure-track faculty, while a smaller number of tenure-track faculty focus on research and graduate education? After all, undergraduate students in most courses are typically being taught material that is far inside the research frontier. Does a more costly reliance on tenured and tenure-track faculty bring corresponding benefits for undergraduate education?

Only recently have economists and other social scientists begun to address this issue. While the results have been mixed, the existing research does suggest that a greater presence of tenured and tenure-track faculty will enhance undergraduate student outcomes. For example, in Ehrenberg and Zhang (2005), my coauthor and I used institutional-level panel data and found that—holding constant other variables including the socioeconomic backgrounds and test scores of entering students, and controlling for institutional fixed effects—when a four-year academic institution increases its use of either full-time, non-tenure-track faculty or part-time faculty, its undergraduate students' first-year persistence rates and graduation rates decrease. Using a similar methodology, Jacoby (2006) found that public two-year colleges that

relied more heavily on part-time faculty had lower graduation rates, while Eagan and Jaeger (2009) and Jaeger and Eagan (2009) found that increased exposure of two-year college students to part-time faculty reduced the likelihood of the students transferring to four-year colleges or completing their associate's degrees. Finally, Bettinger and Long (2007) found that students attending Ohio public four-year colleges that take "adjunct heavy" first-year class schedules are less likely to persist in college after their first year; Jaeger and Eagan (2011) found a similar result for public two-year college students within a single state system.

In contrast, Bettinger and Long (2010) showed that having an adjunct as an instructor in an introductory class in some professional fields increases the likelihood that a student will take additional classes in the field, while Hoffman and Oreopoulos (2009) found that the tenure/tenure-track status and full-time/part-time status of a faculty member has no impact, on average, on student outcomes at a major Canadian research university. Of course, the costs of any increased use of non-tenure-track faculty on graduation and persistence rates must also be balanced against the financial savings from doing so. In Ehrenberg and Zhang (2005), we found, for example, that a 10 point increase in the percentage of full-time faculty not in tenure-track positions was associated with a 4.4 percentage point reduction in graduation rates at public master's-level institutions. As Table 3 indicates, the difference in average salaries between full-time lecturers and assistant professors at these institutions was over \$10,000 a year in 2009–2010.

Given that many non-tenure-track faculty members are dedicated teachers and can devote themselves fully to undergraduate education because they face lesser research expectations, why might they be associated with lower student outcomes than their tenured and tenure-track faculty colleagues? One likely reason is that adjunct faculty appointments are often ad hoc in nature and instructors trying to eke out a living from this type of work must take on higher teaching loads, perhaps spread in across multiple institutions within an urban area, which leaves them little time and often no place to meet students outside of class.<sup>7</sup> Adjunct faculty in this difficult situation are also less likely to be up-to-date on their department's curriculum and may be less prepared to advise students. Non-tenure-track faculty who are full time will often have higher teaching loads than the teaching loads for the tenure-track faculty, which may also leave them with less time to work with individual students outside of class or to keep up with new developments in their field in a way that might encourage students to persist.

The increased pressure for faculty at major research universities to specialize in research has led the doctoral institutions to make greater use of full-time, non-tenure-track faculty in undergraduate education, especially at private universities (as shown earlier in Table 1). On the supply side, the relatively poor academic labor market conditions that currently confront new Ph.D.s, coupled with the large and growing salary differentials between major private research universities and

<sup>7</sup> Zhang and Liu (2010) show that four-year academic institutions in urban areas make more use of part-time faculty than other four-year institutions.

Table 3

**Average Faculty Salary, by Rank and Institution Type in 2009–2010**

<i>Institution/Rank</i>	<i>Assistant professor</i>	<i>Lecturer</i>	<i>Lecturer at private doc./ Asst. prof. in category</i>	<i>Lecturer at public doc./ Asst. prof. in category</i>
Private doctoral	83,573	61,860	0.74	0.62
Public doctoral	68,718	52,529	0.90	0.76
Private master's	63,003	55,272	0.98	0.83
Public master's	59,959	49,796	1.03	0.88
Private bachelor's	58,762	58,167	1.05	0.89
Public bachelor's	57,001	50,628	1.09	0.92
Two-year colleges	53,757	52,681	1.15	0.98

Source: American Association of University Professors, 2010, *The Annual Report on the Economic Status of the Profession: 2009–2010*, table 4. Available at: (<http://www.aaup.org/AAUP/pubsres/research/compensation.htm>).

virtually all other categories of academic institutions (Ehrenberg 2003), have made full-time, non-tenure-track teaching positions at the private doctoral universities an increasingly attractive alternative for new Ph.D.s.

This increased usage of full-time, non-tenure-track teaching positions has brought some efforts to improve the status of such faculty. While teaching loads of these faculty are often higher than those of their tenure-track colleagues (in part because the teaching loads of the latter have declined over time), teaching loads for the non-tenure-track faculty at the private doctoral universities are often lower—or at least no higher—than they would be if they were employed at other academic institutions in tenure-track positions.<sup>8</sup> For example, a fall 2003 survey found that while full-time instructional faculty and staff at public and private doctoral institutions spent an average of about 8 hours per week in the classroom, those at public and private master's programs spent about 11 hours per week in the classroom, and those at public two-year institutions spent 18 hours per week in the classroom (National Center for Education Statistics, 2005).

Table 3 presents data for 2009–2010 on average faculty salaries for assistant professors and lecturers (all departments), by institution type and form of control,

<sup>8</sup> The American Economic Association collects information on average yearly course loads for new assistant professors in economics departments in its annual *Universal Academic Questionnaire* and reports this information annually in its *American Economic Review* Papers and Proceedings (May) issue. The number of respondents to these questions is small, and the respondents vary over time. The responses (with sample sizes in parentheses) were, for academic year 1999–2000: Ph.D. institutions, 3.5 (30); master's institutions, 5.6 (11); and bachelor's institutions, 5.8 (38). For academic year 2009–2010, they were: Ph.D. institutions, 2.9 (35); master's institutions, 6.3(10); and bachelor's institutions 5.6 (32). The greatest reduction in course load was at the Ph.D. institutions. Charles Scott and John Siegfried provided me with information on ten departments at Ph.D. institutions that reported information for both 2010–11 and 2000–01, and the mean course load for new faculty at these departments fell during the ten-year period from 3.27 to 3.0 courses a year.

from a salary survey done by the American Association of University Professors. The private data are for non-church-related institutions. The average salary of lecturers at private doctoral universities is about \$21,500 less than the average salary of assistant professors at those universities; however, it is only slightly lower than the average salary of assistant professors at public doctoral and private master's institutions and is higher than those of assistant professors at public master's, public and private bachelor's, and two-year colleges. These data suggest that the financial costs of accepting a lecturer position at a private doctoral university, if any, may not be that high relative to accepting an assistant professor position at most other types of academic institution, at least in the short-run. Furthermore, these non-tenure-track jobs need not come without a degree of job security. Conversations that I have had with economists at several private doctoral universities, who are either employed in non-tenure-track positions or are chairs of departments that hire such faculty, suggest that many of these positions now often offer "rolling multiyear contracts." For example, a lecturer may teach under a three-year contract that can be extended annually for a year if performance is satisfactory. Moreover, positions for non-tenure-track faculty members often have low or no research expectations, while offering an opportunity to teach at a major university with bright students and high-quality colleagues.

The data in Table 3 indicate that the average salary of lecturers at public doctoral universities is lower than the average salary of assistant professors in all categories of institutions. However, because of the lower teaching loads that the public doctoral institutions offer, jobs at such institutions may be attractive to new Ph.D.s given the current conditions of the academic labor market. Such programs also can attract high-quality, non-tenure-track faculty. Given the access of both public and private doctoral institutions to high-quality, non-tenure-track faculty, it should not be surprising that in Ehrenberg and Zhang (2005) we found that the expansion of full-time, non-tenure-track positions at doctoral universities had a smaller effect on undergraduate students' persistence and graduation rates than it had at the public master's-level institutions.

The data cited above from the Committee on the Status of Women in the Economics Profession (CSWEP) indicate that the average share of non-tenure-track faculty that is female at Ph.D. departments of economics is greater than the average share of assistant professors that is female at these same departments. A considerable body of research has noted the underrepresentation of females, relative to their share of new Ph.D.s, in tenure-track positions in science and engineering fields at research universities. A study by the National Research Council (2010) found that this underrepresentation is largely because female Ph.D.s are not applying for these positions at the same rate as their male counterparts. One obvious possible reason for this is that female scientists in their child-bearing years face a more difficult challenge than their male colleagues in striking a work-life balance (Mason and Goulden 2004). As a result, many research universities are adopting policies to alter the workplace and faculty culture to accommodate family issues (see for example, the UC Family Friendly Edge project, at <http://ucfamilyedge.berkeley.edu>)).

Table 4

**Annual Average Percentage Real Changes in Expenditures per Full-Time Equivalent Student: FY1987–2008**

	<i>N</i>	<i>Instruction</i>	<i>Student services</i>	<i>Academic support</i>	<i>Research</i>	<i>Public service</i>	<i>Institutional support</i>	<i>Operations and maintenance</i>	<i>Auxiliary</i>
Public doctoral	151	0.87	1.64	1.39	2.89	2.13	1.35	0.79	0.46
Private doctoral	103	1.87	3.13	2.87	2.35	2.83	2.60	1.05	1.42
Public master's	227	0.72	1.82	1.49	2.80	2.81	1.27	0.70	0.06
Private master's	327	1.55	2.66	2.13	2.18	0.75	1.57	-0.33	0.11
Private bachelor's	461	1.70	3.05	2.17	2.95	1.26	1.76	-0.23	0.52
Public 2-year	739	0.67	1.57	1.14	0.06	1.00	1.42	0.76	0.42
All public	1,192	0.75	1.66	1.22	2.74	1.69	1.39	0.77	0.37
All private	891	1.67	2.94	2.22	2.39	1.40	1.79	-0.12	0.49
All	2,083	1.07	2.16	1.62	2.63	1.66	1.57	0.51	0.40

*Source:* Author's calculations from Integrated Postsecondary Education Data System (IPEDS) data as cleaned by the Delta Cost Project (<http://www.deltacostproject.org>). Public bachelor's institutions are excluded from this table because of the relatively small number of them that reported data in both years. *Note:* Institutions classified as "master's" typically offer undergraduate and master's degrees; and those classified as "doctoral" typically offer a wide range of undergraduate and graduate degrees including doctoral degrees.

**Why Is a Declining Share of Resources Going to Instruction?**

The share of academic resources going to instructional expenditures has declined at all categories of public and private not-for-profit institutions. On average, instructional expenditures per full-time-equivalent student—primarily faculty salary and benefits—increased by 1.07 percent a year above the rate of increase in the Consumer Price Index during the fiscal years 1987–2008, as shown in the bottom row of Table 4. In contrast, average real expenditures per full-time-equivalent student grew at more rapid annual rates for most other categories of institutional expenditures. These reallocations of funds away from instruction have been a major factor driving the shift away from full-time tenure and tenure-track faculty.

Why did these budget reallocations occur? The funding of higher education institutions comes from a variety of sources—and funds provided for some activities cannot be transferred to other activities.<sup>9</sup> For example, the "public service" category includes separately budgeted funds for non-instructional services to external

<sup>9</sup> Appendix Table A1, available online with this paper at (<http://e-jep.org>), illustrates how the sources of funds vary across categories of public and private not-for-profit academic institutions.

groups, such as cooperative extension activities, public broadcasting, and externally funded conferences. These activities are supported largely by targeted state appropriations, external grants, and targeted fundraising, and these funds cannot be used to support instructional activities.

Similarly, the research category includes sponsored research, which grew substantially during the period. Funds provided by external sponsors for research cannot be used for instruction. Moreover, during this period the share of academic research supported out of institutional funds grew dramatically, due to limitations established by the Office of Management and Budget in 1991 on “federal indirect cost rates” or “facilities and administration charges” (the “mark-up” allowed on the direct costs of research when universities are reimbursed through government research grants); growing requirements by the federal government for matching funds in grant proposals; and the growing cost of providing start-up funding for new scientists and engineers, which often is not recoverable in indirect cost rates (Ehrenberg, Rizzo, and Jakobson 2007). As a result, the percentage of academic institutions’ total cost of research that is paid for by the institutions themselves out of institutional funds grew from about 12 percent in fiscal year 1976 to over 20 percent in fiscal year 2008 (Berdahl 2009). Increases in the institutional resources that academic institutions devote to research are associated, *ceteris paribus*, with increases in student/faculty ratios and with some substitution of full-time lecturers for professorial rank faculty (Ehrenberg, Rizzo, and Jakobson 2007). In addition, the growing use of part-time faculty at doctoral institutions, holding constant the use of full-time faculty, has been shown to be associated with increased external research and development expenditures at an institution; using adjuncts at doctoral universities to reduce the teaching loads of full-time faculty allows the full-time faculty to generate more external research funding (Zhang and Ehrenberg 2010).

“Student service expenditures” include costs of admissions, registrar activities, and activities whose primary purpose is to contribute to students’ emotional and physical well-being and to their development outside of the classroom. Examples include student activities, cultural events, student newspapers, intramural athletics, student organizations, supplementary instruction (such as tutoring), and student records. Intercollegiate athletics and student health services *may* also be included in this category of expenses, except when they are operated as self-supporting auxiliary enterprises.<sup>10</sup> The annual growth rates of student service expenditures are roughly double those of the annual growth rates of instructional expenditures for every category of academic institutions.

These expenditures are viewed by some critics as discretionary “frills” that make no direct contribution to students’ persistence in and graduation from college. In

<sup>10</sup> In the sample upon which Table 4 is based, over half of the institutions included varsity athletics in student service expenditures. The percentage that did so was over 80 percent for the private bachelor’s and master’s institutions and slightly more than 20 percent for the public doctoral institutions. “Public doctoral” is the only category of institutions in which more than a majority of the institutions (over 70 percent in our sample) included varsity athletics under auxiliary expenditures.

Webber and Ehrenberg (2010), we showed, however, that they do positively influence both first-year persistence rates and graduation rates of undergraduate students at four-year academic institutions. Moreover, as one might expect, these expenditures have greater effects at institutions that enroll a greater share of students who are disadvantaged, as measured by either their average entrance test scores or the levels of Pell Grant dollars that they receive. Indeed, our simulations suggest that at institutions whose graduation rates were below the mean in the sample, reallocating some resources from instruction to student services would lead, on average, to an increase in graduation rates; a similar reallocation was shown not to increase graduation rates at institutions whose graduation rates were initially at or above the mean. At least for a subset of higher education institutions, the more rapid growth of student service expenditures over the period may not be symptomatic of waste.

“Academic support expenditures” are for the activities and services that support instruction, research, and public service, including libraries, museums, and academic computing. The more rapid growth rate of expenditures in this category happens in part because, while the corporate world often adopts technology to cut costs, in the academic world, technology has often been adopted by academic institutions to enhance student learning and provide students with tools they will need to compete in the job market (Archibald and Feldman 2011). Another factor in this category is the growing costs of libraries; inflation rates for library materials have, for a long time, far exceeded the general rate of inflation, and the proliferation of electronic journals have increased, rather than decreased library costs (Ehrenberg 2002, chap. 14). The Association of Research Libraries (2009, table 2) reports that between 1986 and 2006, the average price of a serial purchased by research libraries increased by 5.3 percent a year; the average annual increase in the Consumer Price Index was 3.05 percent during the same period.

“Institutional support expenditures” include legal, finance, audit, human resources, budget, alumni affairs and development, audit and risk management, and public relations costs of the university. A dramatic proliferation of government regulations and reporting requirements, as well as a cap of 26 percent in the administrative cost component of federal indirect cost rates, has substantially increased the costs borne by academic institutions in this category. Higher education institutions regularly plead for regulatory relief and an easing of reporting requirements in a variety of areas, including human subjects, animal research, effort reporting, financial reporting, conflict of interest, and hazardous materials (Association of American Universities 2011).

Higher education institutions have increasingly devoted more resources to alumni affairs and development activities, seeking to enhance flows of giving from alumni, other individuals, corporations, and foundations. From fiscal years 1989 to 2009, voluntary support to higher education institutions per student grew, on average, by about 2.3 percent a year in real terms (Council for Aid to Education 2010, table 2). These funds support current operations, capital projects, and the endowment—so not all giving shows up in current operating budgets. While the costs of generating gifts varies widely, a widely cited 1990 study found that the

mean cost over all academic institutions was in the range of 15 to 17 cents per dollar raised in the late 1980s (Council for Advancement and Support of Education, 1990). A new study is underway; the results from its pilot study of a relatively small number of institutions indicate that while the costs per dollar raised continue to vary across institutions, on average they remain similar to the earlier study.<sup>11</sup> If the costs per dollar raised remained roughly constant over the period, academic institutions' investments in fund-raising clearly also contributed to the increase in institutional support expenditures.

Expenditures on auxiliary enterprises are typically supported primarily by user fees: for example, hospitals, campus stores, residence halls, and food service all receive very little support from institutions' operating budgets. These expenditures, as well as those on operations and maintenance, grew at slower rates than instructional expenditures. Kaiser and Davis (1996) estimated that American higher education institutions had \$26 billion dollars of accumulated deferred maintenance in 1995, of which \$5.7 billion were urgent needs, so the slow growth of operations and maintenance expenditures may portend longer-run problems. Private conversations that I have had with James A. Kadamus, Vice President of Sightlines, a facility asset advisory firm that has the largest verified academic institution facilities database in the country, also suggests that this may well be the case. Academic institutions, in particular public institutions, have large aging facilities structures; recently, funding for maintenance of these facilities has not kept up with needs. And the additions of new facilities increases operating and maintenance needs, often without full thought in advance about where operating and maintenance funds will come from. Only a rare institution firmly commits not to increase the total square footage of facilities on the campus. However, the Ohio State University took this step in June 2010, when the Board of Trustees adopted a framework for capital facilities that called for adding to academic space only as replacements for existing facilities.

The explanations I have provided for the decreasing share of academic budgets going to instruction does not mean that I believe that academic institutions have always carefully controlled their administrative costs. They have not! Political scientist Benjamin Ginsberg (2011) argues that the growth of administration is largely due to the growth of a class of professional administrators who seek to "feather their own nests"; the result is the expansion of the bureaucracy and the declining role of the faculty in academic governance. However, the financial meltdown and deep recession that started in 2008 caused many colleges and universities to address their administrative cost levels. A number of the more wealthy public and private universities hired outside consultants to advise them how to restructure their administrative services (Keller 2010). The consultants' recommendations commonly fell into several main categories; reducing the layers of administration; increasing the number of direct reports each administrator supervises; centralizing procurement at large institutions and systems of institutions to achieve price concessions from

<sup>11</sup> Private correspondence from Rae Goldsmith, Vice President for Advancement Resources, Council for Advancement and Support of Education (CASE).

suppliers; achieving efficiencies in information technology; and reorganizing the delivery of support services, such as finance, communications, and human resources. At Cornell, for example, we expect to achieve savings of \$75–85 million a year on our Ithaca campus by fiscal year 2015 from these efforts (see <http://asp.dpb.cornell.edu>), which represents more than 5 percent of Cornell's operating budget once one removes external research funding. Continual efforts to reduce both administrative and other costs will be necessary if academia is to have any hope of reducing rates of tuition increases.

### **Changing Modes of Instruction, Technology, and the For-Profit Sector**

The financial pressures being placed on academic institutions, along with demands to increase access and to support students in persisting to the completion of a degree, are forcing institutions to reexamine how they educate students. Institutions are reexamining the prevailing “lecture/discussion” format. Many institutions, in particular those in the for-profit sector, are seeking to use technology to improve learning outcomes *and* to reduce the cost of instruction, especially in remedial and introductory classes. Several evaluation studies suggest online education can be as effective as regular classroom contacts, especially for mature students, and that a blend of online and face-to-face instruction is often more effective than online instruction alone (Means, Toyama, Murphy, Bakia, and Jones 2009). These efforts may well have substantial effects on costs and on the nature of the academic workforce in the future.

One prominent illustration of this point is the work of the National Center for Academic Transformation (NCAT), which has led efforts to use information technology to improve learning outcomes and reduce costs. The NCAT website (<http://www.thencat.org/>) lists over 30 large introductory courses that have been redesigned with its help, in quantitative, social science, humanities, and professional fields at a wide range of academic institutions, and provides links to descriptions of each redesign. The NCAT efforts tend to focus on replacing lectures with interactive computer-based learning resources such as tutorials, exercises, and frequent low-stakes quizzes, as well as individual and small group activities. Other points of emphasis include designing classes around mastering a series of learning objectives, and providing on-demand help, often in computer labs or online, staffed by a mixture of faculty, graduate assistants, peer tutors, or course assistants. Some of the cost reduction comes from a reduced reliance on costly full-time faculty and graduate assistants and an increased use of less-costly peer tutors and course assistants, who do things such as troubleshooting technical questions, monitoring student performance, and alerting the instructor to difficulties with teaching materials. This process may also enable institutions to leverage their best teachers more effectively.

Despite the successes of the classes reworked under the guidance of the National Center for Academic Transformation, dissemination of this model within and across institutions has been slow. There are numerous reasons: faculty skepticism about

the usefulness of NCAT's approaches (in the face of the evidence); concerns about infringement on academic freedom in making decisions about how to teach; the unwillingness of some faculty to invest in new teaching methods; departmental concerns that the benefits of cost reduction will not accrue to them and that they will lose faculty positions; the difficulty of obtaining funds for required capital investments; and the need for stable leadership at departmental, college, university, and system levels committed to changing modes of instruction (Miller 2010).

A second example of innovative technology-based pedagogy comes from the Open Learning Initiative at Carnegie Mellon University (at <http://oli.web.cmu.edu/openlearning/initiative>). This project has designed more than a dozen classes in introductory subjects—in primarily mathematics and science fields—that make use of advances in cognitive knowledge about how learning occurs and that use technology to create intelligent tutoring systems, virtual laboratory simulations, and frequent opportunities for assessment. The Open Learning Initiative has made these classes freely available on its webpage. An evaluation of an introductory statistics class taught at Carnegie Mellon showed that when a hybrid model that combined online learning with classroom instruction was used, students learned as much or more than they did in classes using traditional instructional methods and in half the time (Lovett, Meyer, and Thille 2008). Other evaluations have confirmed the effectiveness of the Open Learning Initiative approach for other classes and for students at large public universities and community colleges (Thille and Smith 2011).

The activities of both the National Center for Academic Transformation and the Open Learning Initiative suggest that technology can be used to improve educational outcomes and reduce the time (per student) spent by faculty in introductory-level classes at institutions ranging from community colleges to doctoral institutions. These initiatives appear less likely to influence methods of instruction in specialized upper-level elective classes. Their activities also suggest that the comparison that one should be making is not between lecture classes taught by adjuncts and those taught by tenured professors (as many of the studies I cited earlier implicitly did), but between the various different ways of organizing and staffing a course and the traditional lecture/discussion format.

More specifically, how has teaching of economics changed? National surveys have been conducted of the teaching methods used by academic economists in their classrooms in 1995, 2000, 2005, and 2010 (Watts and Becker 2008; Watts and Schauer 2011). While these surveys offer some evidence of increased use of Power-Point displays, instructors putting class notes online, increased use of computer lab assignments in econometrics classes, and increased use of classroom experiments in introductory economics classes, the surveys also suggest that “chalk and talk” remains the dominant teaching method in economics (Watts and Schauer 2011).

However, response rates to the surveys have not been high: the 2010 survey had a response rate of only 10.5 percent. Thus, the surveys may not be capturing innovations in teaching economics. For example, there is an Open Learning Initiative introductory economics class developed by John Miller at Carnegie Mellon University that is associated with a textbook based in experimental economics

(Bergstrom and Miller 1999). An innovation from the private sector involves Aplia, an educational technology company founded in 2000 by Paul Romer, which offers online homework assignments (with immediate grading), math and graphing tutorials, articles from news sources, real-time online market experiments, and course management systems. Currently, Aplia offers course support for introductory and intermediate microeconomics and macroeconomics, as well as courses in money, banking, and financial institutions; international economics; and advanced placement economics. Many of these classes are integrated with leading textbooks in the field.<sup>12</sup> Lyssa Vanderbeck, Director of Program Management at Aplia, reported that about 147,000 students in over 4,900 economics courses used Aplia during the fall of 2010 (e-mail communication to me, June 1, 2011).

As demonstrated in Table 1, the growing for-profit higher education sector has been the leading sector in using part-time and full-time, non-tenure-track faculty. A growing number of institutions in this sector have also been in the forefront of attempting to use technology to improve educational outcomes and developing new methods of recruiting, training, and assessing faculty members. For example, the University of Phoenix, the largest for-profit, offers associate's, bachelor's, master's, and doctoral programs in primarily professional fields to primarily working adults. The vast majority of its faculty members are practicing professionals and part-time faculty. The University of Phoenix puts them through extensive orientation and training programs. About two-thirds of these faculty have master's degrees and one-third, doctoral degrees. Curricula are developed by experts and are fairly standardized. Extensive use is made of technology to facilitate student learning, including placing course materials online, using online tutors, and having students conduct their own online self-assessments of learning. Faculty members are evaluated both by feedback from students and from assessments of how well students have mastered the subject matter. As is common with most for-profits, University of Phoenix offers classes at times and places that are most convenient for students, especially working adults.

Institutions that compete most directly with the for-profits, in particular community colleges and comprehensive public universities, will increasingly face pressure to emulate the educational model of the for-profits: in particular, they will face pressure to expand their use of part-time faculty further and to consider evaluating faculty members based more upon student outcomes. At least so far, efforts by traditional academic institutions to embed student learning outcomes in course evaluations are few and far between. Examples of efforts to embed learning outcomes in course evaluations include those of the IDEA Center (at <http://www.ideacenter.org>) and the Student Assessment of Learning Gains (at <http://www.salgsite.org>).

<sup>12</sup> The Aplia website is at (<http://aplia.com/economics>). An example of Aplia's active learning materials are the active learning problem sets for principles of economics developed by Byron Brown of Michigan State University that are used by him in both his regular classroom and online teaching at (<http://www.bus.msu.edu/econ/brown/pim>).

Table 5

**Percentages of Four-Year Public Institutions with Differential Undergraduate Tuition in 2010–2011**

	<i>Doctoral</i>	<i>Master's</i>	<i>Bachelor's</i>
Number of institutions	172	271	120
Percent with any differential tuition	42	18	30
Percent with differential tuition by college or major	40	17	23
Percent with differential tuition by year enrolled	10	4	23

*Source:* Author's calculations from search of institutional web pages during the January to March 2011 period.

*Note:* Institutions classified as "associate's" typically offer two-year degrees as the highest degree; those classified as "bachelor's" offer primarily bachelor's degrees; those classified as "master's" typically offer undergraduate and master's degrees; and those classified as "doctoral" typically offer a wide range of undergraduate and graduate degrees including doctoral degrees. Bachelor's institutions exclude public colleges that offer some bachelor's degrees but that primarily offer associate's degrees.

## Differential Tuition

American colleges and universities have historically charged the same tuition levels for all of their undergraduate majors (with the exception perhaps of laboratory fees). However, as Hoenack and Weiler (1975) and Siegfried and Round (1997) pointed out, an academic institution might plausibly seek to charge different tuition levels for different majors based upon the costs of providing an education in each major and the income-earning prospects that it offers. Indeed, a growing number of public institutions are adopting differential tuitions by college or major, or by year of enrollment. To gauge how prevalent this trend has become, from November 2010 to March 2011 my research assistants pored through the web pages of virtually all public academic institutions that grant bachelor's degrees searching for information on differential tuitions. Table 5 summarizes their findings. The percentage of public institutions with differential tuitions in 2010–2011 was highest, at 42 percent, at the doctoral institutions. If one further narrows the doctoral category to flagship doctoral institutions, the percentage increases to over half.

Differential tuition for these institutions is typically by college or by major, although a smaller percentage of them have differential tuition by year of enrollment, with upper-level students being charged more per credit hour than lower-level students. At the public master's institutions, differential tuition is almost always by college or major. In contrast, at the public bachelor's institutions, when differential tuition policies arise they are equally likely to be by college or major as by year of enrollment.

The most common programs for which differential tuition charges occur are business, engineering, and nursing. Examples of differential tuition charges in 2010–2011 that were obtained from institutional web pages include a \$75 per engineering course fee at the University of Maine (a 9.4 percent increase over the

in-state tuition of \$801 for a three credit course), a \$400 per credit hour additional tuition for business classes at Arizona State University (a 72 percent increase over the in-state per credit hour tuition of \$557), and a \$460 per semester nursing program fee at the University of Kentucky (a 10.7 percent increase over the in-state lower-division semester tuition of \$4,305).

The possible consequences of differential tuition policies have not been empirically examined. Does differential tuition by major influence students' choice of major? Do higher tuition levels for upper-level students affect ultimate graduation rates? If such effects exist, are they larger for students from lower-income families? How might differential tuition charges interact with state and institutional financial aid policies?

### **Looking to the Future**

Many faculty members will bemoan the decline of a golden age of American higher education, with its heavy reliance on tenured and tenure-track faculty. However, higher education is not immune to economic forces. The pressures that public and private colleges and universities face to expand enrollment, to increase graduation rates, and to limit future cost increases will likely only exacerbate the decline in full-time tenured and tenure-track faculty. Increasingly, academic leaders realize that how we teach our students must change, especially for remedial and introductory-level classes, and that technology must be employed to improve learning outcomes and reduce the per student costs of delivering instruction (Stripling 2011).

I am not noted for my ability to forecast the future, but I conclude with some personal speculations. The wealthy private and flagship public research universities and the leading private liberal arts colleges are in a world of their own. They will have access to the resources necessary to maintain full-time tenured and tenure-track faculty. They will increasingly employ technology in introductory-level classes in an effort to expand active learning and reduce costs, but in their case much of the cost savings will be directed to enhancing the quality of upper-division classes and furthering the research enterprise.

At research universities, the use of full-time, non-tenure-track faculty will likely continue and increase. For at least some new Ph.D.s, the combination of the pay levels at these institutions, their relatively low teaching loads (compared to other types of institutions), the low or nonexistent research demands, the possibility of rolling multiyear contracts, and the attractions of working at a large university will suffice to keep these non-tenure-track positions attractive. One result of this shift will be to free up more of the time of tenured and tenure-track faculty for research.

At the public and private regional doctoral universities, the public and private comprehensives, the other liberal arts colleges, and the two-year colleges, an ever-increasing share of faculty will not have doctoral degrees and will not be full-time

on tenure-track lines. The use of technology and people in nonfaculty positions (like student assistants) to reduce costs and increase learning in remedial and introductory-level classes will likely occur much more rapidly at these institutions.

For all academic institutions, pressures for accountability surely will increase; academic institutions are increasingly being asked to provide information on assessing student learning outcomes as part of the accreditation process. Recent research by Arum and Roksa (2011) that concluded very little learning occurs in higher education for a large proportion of American students surely will add to these pressures. As such, one might expect to see an increased focus, especially in remedial and introductory classes, on evaluating faculty, at least partially, by their students' outcomes, as the for-profits do. This will put additional stresses on faculty/administration relations and faculty governance, especially at public campuses where collective bargaining contracts may specify faculty evaluation processes.

Few students who enter a Ph.D. program do so for the promise of financial rewards: other professional schools and alternate careers often promise higher annual earnings. Instead, students considering a Ph.D., especially those not considering degrees in science and engineering fields, have historically done so with the dreams of becoming a tenured faculty member and then pursuing a combination of research and teaching while participating in the governance of an academic institution. However, obtaining a Ph.D. has already become a less-attractive option in many fields, given the lengthening periods of time to complete the degree and the low levels of tenure-track hiring in the academic job market in recent years. Between 1979 and 2009, at U.S. universities, the share of new doctorates awarded to U.S. citizens and permanent residents (among recipients with known nationalities) fell from 88 to 69 percent. By 2009, less than 40 percent of the new doctorates in economics were awarded to U.S. citizens or permanent residents (*2009 Survey of Earned Doctorates*, tables 16 and 19, available at <http://www.nsf.gov/statistics/nsf11306/>).

The share of faculty positions that are not on the tenure-track, and perhaps not full-time either, along with the high fraction of such positions staffed by faculty without a doctorate, will likely further discourage American college students from going on for Ph.D. study. Moreover, as the share of full-time tenured and tenure-track faculty dwindle, this group will inevitably play a lesser role in the governance of the institutions of higher education.

■ *Financial support for the Cornell Higher Education Research Institute (CHERI) is provided by the Andrew W. Mellon Foundation and I am grateful to the Foundation for its support. Raj Kannappan, Andrew Key, Kristy Parkinson, Mirinda Martin, Douglas Webber, and Kenneth Whelan, all graduate and undergraduate research assistants at CHERI, assisted me in obtaining some of the data used in the paper, and I am also grateful for their help. Extraordinarily helpful comments on earlier drafts were provided by Charles Clotfelter, Gary Fethke, Daniel Hamermesh, Philip Lewis, and John Siegfried, as well as from the JEP editors. In places, this paper draws on Ehrenberg (2011).*

## References

- American Association of University Professors (AAUP).** N.d. "Trends in Faculty Status, 1975–2007." AAUP Fact Sheet. <http://www.aaup2.org/research/TrendsinFacultyStatus2007.pdf>.
- American Association of University Professors (AAUP).** 2010. *The Annual Report on the Economic Status of the Profession: 2009–2010*, table 4. Available at: <http://www.aaup.org/AAUP/pubsres/research/compensation.htm>.
- Archibald, Robert B., and David H. Feldman.** 2011. *Why Does College Cost So Much?* New York: Oxford University Press.
- Arum, Richard, and Josipa Roksa.** 2011. *Academically Adrift: Limited Learning on American Campuses.* Chicago: University of Chicago Press.
- Association of American Universities.** 2011. "Regulatory and Financial Reform of Federal Research Policy: Recommendations to the NRC Committee on Research Universities." January 21, Available at: <http://www.aau.edu/publications/reports.aspx?id=6900>.
- Association of Research Libraries.** 2009. *ARL Statistics: 2007–2008.* Washington, DC: Association of Research Libraries.
- Baum, Sandy, and Jennifer Ma.** 2010. *Trends in College Pricing 2010.* New York: College Board.
- Berdahl, Robert M.** 2009. "Thoughts on the Current Status of American Research Universities: A Presentation to the National Academy's Board on Higher Education and Work Force." November 16. Available at: [http://aau.edu/research/statement\\_speech.aspx?id=6898](http://aau.edu/research/statement_speech.aspx?id=6898).
- Bergstrom, Theodore, and James Miller.** 1999. *Experiments with Economic Principles: Microeconomics.* New York: McGraw-Hill.
- Bettinger, Eric P., and Bridget Terry Long.** 2007. "The Increased Use of Adjunct Instructors at Public Universities: Are We Hurting Students?" In *What's Happening to Public Higher Education*, edited by Ronald G. Ehrenberg, 51–70. Baltimore: Johns Hopkins University Press.
- **Bettinger, Eric P., and Bridget Terry Long.** 2010. "Does Cheaper Mean Better: The Impact of Using Adjunct Instructors on Student Outcomes." *Review of Economics and Statistics* 92(3): 598–630.
- Brewer, Dominic J., Eric R. Eide, and Ronald G. Ehrenberg.** 1999. "Does It Pay to Attend an Elite Private College? Cross-Cohort Evidence of the Effects of College Type on Earnings." *Journal of Human Resources* 34(1): 104–23.
- Council for Advancement and Support of Education.** 1990. *Expenditures in Fund Raising, Alumni Relations, and Other Constituent (Public) Relations.* Washington, DC: Council for Advancement and Support of Education.
- Council for Aid to Education.** 2010. *2009 Voluntary Support of Higher Education.* New York: Council for Aid to Education.
- Dale, Stacy, and Alan B. Krueger.** 2002. "Estimating the Payoff to Attending a More Selective College: An Application of Selection on Observables and Unobservables." *Quarterly Journal of Economics* 117(4): 1491–1527.
- Dale, Stacy, and Alan B. Krueger.** 2011. "Estimating the Returns to College Selectivity over the Career Using Administrative Earnings Data." NBER Working Paper 17159.
- Desrochers, Donna M., Colleen M. Lenihan, Jane V. Wellman.** 2010. *Trends in College Spending: 1998–2008.* Washington, DC: Delta Cost Project. Available at: <http://www.deltacostproject.org/analyses/index.asp>.
- **Eagan, M. Kevin, and Audrey J. Jaeger.** 2009. "Effects of Exposure to Part-Time Faculty on Community College Transfer." *Research in Higher Education* 50(2): 168–88.
- Ehrenberg, Ronald G.** 2002. *Tuition Rising: Why College Costs So Much.* Cambridge, MA: Harvard University Press.
- **Ehrenberg, Ronald G.** 2003. "Studying Ourselves: The Academic Labor Market." *Journal of Labor Economics* 21(2): 267–87.
- Ehrenberg, Ronald G.** 2006. "The Perfect Storm and the Privatization of Public Higher Education." *Change* 38(1): 46–53.
- Ehrenberg, Ronald G., ed.** 2007. *What's Happening to Public Higher Education? The Shifting Financial Burden.* Baltimore: Johns Hopkins University Press.
- Ehrenberg, Ronald G.** 2010. "The Economics of Tuition and Fees in American Higher Education." In Vol. 2 of *The International Encyclopedia of Education* 3<sup>rd</sup> edition, edited by Barry McGraw, Penelope Peterson, and Eva Baker, 229–34. Oxford, UK: Elsevier.
- Ehrenberg, Ronald G.** 2011. "Rethinking the Professoriate." In *Reinventing Higher Education: The Promise of Innovation*, edited by Ben Wildavsky, Andrew Kelly, and Kevin Carey, 101–28. Cambridge, MA: Harvard Education Press.
- Ehrenberg, Ronald G., Paul J. Pieper, and Rachel A. Willis.** 1999. "Do Economics Departments with Lower Tenure Probabilities Pay Higher Faculty Salaries?" *Review of Economics and Statistics* 80(4): 503–12.
- Ehrenberg, Ronald G., Michael J. Rizzo, and George H. Jakubson.** 2007. "Who Bears the

- Growing Cost of Science at Universities?" In *Science and the University*, edited by Paula E. Stephan and Ronald G. Ehrenberg, 19–35. Madison: University of Wisconsin Press.
- **Ehrenberg, Ronald G., and Liang Zhang.** 2005. "Do Tenured and Tenure-Track Faculty Matter?" *Journal of Human Resources* 40(3): 647–59.
- Ginsberg, Benjamin.** 2011 *The Fall of the Faculty; The Rise of the All-Administrative University and Why It Matters*. New York: Oxford University.
- **Hoernack, Stephen A., and William C. Weiler.** 1975. "Cost-Related Tuition Policies and University Enrollments." *Journal of Human Resources* 10(3): 332–60.
- Hoffman, Florian, and Phillip Oreopoulos.** 2009. "Professor Quality and Student Achievement." *Review of Economics and Statistics* 91(1): 83–92.
- **Jacoby, Daniel.** 2006. "Effects of Part-Time Faculty Employment on Community College Graduation Rates." *Journal of Higher Education* 77(6): 1081–1103.
- Jaeger, Audrey J., and M. Kevin Eagan.** 2009. "Unintended Consequences: Examining the Effect of Part-Time Faculty Members on Associate's Degree Completion." *Community College Review* 36(1): 167–94.
- Jaeger, Audrey J., and M. Kevin Eagan.** 2011. "Examining Retention and Contingent Faculty Use in a State System of Higher Education." *Education Policy* 25(3): 507–37.
- Kaiser, Henry H., and Jerry Davis.** 1996. *A Foundation to Uphold: A Study of Facilities Conditions at U.S. Colleges and Universities*. Alexandria, VA: APPA, Association of Higher Education Facilities Officers.
- Keller, Josh.** 2010. "Universities Can Save Millions by Cutting Administrative Waste, Panelists Say." *Chronicle of Higher Education*, July 25. <http://chronicle.com/article/Universities-Can-Save-Millions/123686/>.
- Lazear, Edward.** 1979. "Why Is There Mandatory Retirement?" *Journal of Political Economy* 87(6): 1261–84.
- Lovett, Marsha, Oded Meyer, and Candace Thille.** 2008. "The Open Learning Initiative: Measuring the Effectiveness of OLI Statistics Courses in Accelerating Student Learning." *Journal of Interactive Media in Education*, no. 14, JIME Special Issue: Researching Open Content in Education. <http://jime.open.ac.uk/2008/14>.
- Mason, Mary Ann, and Mark Goulden.** 2004. "Do Babies Matter (Part II)? Closing the Baby Gap." *Academe* 90(6): 11–16.
- Means, Barbara, Yukie Toyama, Robert Murphy, Marianne Bakia, and Karla Jones.** 2009. *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*. Washington, DC: U.S. Department of Education.
- Miller, Ben.** 2010. "The Course of Innovation: Using Technology to Transform Higher Education." Education Sector Reports. May 18. <http://www.educationsector.org/publications/course-innovation-using-technology-transform-higher-education>.
- National Association of College and University Business Officers.** 2009. "Newly Released NACUBO Tuition Discounting Study Survey Report Shows Rates Remain Stable." [http://www.nacubo.org/Research/Research\\_News/Newly\\_Released\\_NACUBO\\_Tuition\\_Discounting\\_Survey\\_Report\\_Shows\\_Rates\\_Remain\\_Stable.html](http://www.nacubo.org/Research/Research_News/Newly_Released_NACUBO_Tuition_Discounting_Survey_Report_Shows_Rates_Remain_Stable.html).
- National Association of College and University Business Officers.** 2010. *2009 NACUBO Tuition Discounting Study of Independent Institutions*. Washington, DC: National Association of College and University Business Officers.
- National Center for Education Statistics.** 2005. Table 21 of *2004 National Study of Postsecondary Faculty (NSOPF:04): Background Characteristics, Work Activities, and Compensation of Instructional Faculty and Staff: Fall 2003*. December. <http://nces.ed.gov/pubs2006/2006176.pdf>.
- National Research Council.** 2010. *Gender Differences at Critical Transitions in the Careers of Science, Engineering and Mathematics Faculty*. Washington, DC: National Academy Press.
- Rosen, Sherwin, and Edward Lazear.** 1981. "Rank Order Tournaments as Optimal Labor Contracts." *Journal of Political Economy* 89(5): 841–64.
- Scott, Charles, and John Siegfried.** 2009. "American Economic Association Universal Academic Questionnaire Summary Statistics." *American Economic Review* 99(2): 641–45.
- Siegfried, John, and David Round.** 1997. "Differential Fees for Degree Courses in Australian Universities." In *Funding Higher Education: Performance and Diversity*, edited by Jonathan Pincus, and Paul Miller, 45–62. Canberra: Department of Employment, Education, Training, and Youth Affairs.
- Snyder, Thomas D, and Sally A. Dillow.** 2010. *Digest of Education Statistics 2009*. NCES 2010-13. Washington, DC: U.S. Department of Education.
- State Higher Education Executive Officers.** 2011. *State Higher Education Finance: FY 2010*. Boulder: SHEEO.
- Stigler, George.** 1984. "An Academic Episode." In *The Intellectual and the Marketplace*. Edited by George Stigler, 1–9. Cambridge, MA: Harvard University Press.

**Stripling, Jack.** 2011. "Governing Boards Turn to Technology to Reinvent the University." *Chronicle of Higher Education*, April 5.

**Supiano, Beckie, and Andrea Fuller.** 2011. "Elite Colleges Fail to Gain More Students on Pell Grants." *Chronicle of Higher Education*, March 27.

**Thille, Candace, and Joel Smith.** 2011. "Cold Rolled Steel and Knowledge: What Can Higher Education Learn About Productivity?" *Change* 43(2): 21–27.

**Watts, Michael, and William E. Becker.** 2008. "A Little More than Chalk and Talk: Results from a Third National Survey of Teaching Methods in Undergraduate Economics Courses." *Journal of Economic Education* 39(3): 273–86.

**Watts, Michael, and Georg Schaeur.**

2011. "Teaching and Assessment Methods in Undergraduate Economics: A Fourth National Quinquennial Survey." *Journal of Economic Education* 42(3): 294–309.

**Webber, Douglas A., and Ronald G. Ehrenberg.** 2010. "Do Expenditures Other than Instructional Expenditures Affect Graduation and Persistence Rates in American Higher Education?" *Economics of Education Review* 29(6): 947–58.

**Zhang, Liang, and Ronald G. Ehrenberg.** 2010. "Faculty Employment and R&D Expenditures at Research Universities." *Economics of Education Review* 29(3): 329–37.

**Zhang, Liang, and Xiangmin Liu.** 2010. "Faculty Employment at 4-Year Colleges and Universities." *Economics of Education Review* 29(4): 543–52.