STRUCTURAL CHANGE IN FACULTY ROLES AT RESEARCH UNIVERSITIES

Roger L. Geiger

‘Academic drift’ is the term that has long been employed to indicate institutional or departmental aspirations for greater participation in sponsored research and academic publishing. This tendency has also long been interpreted as detrimental to undergraduate teaching. Thus, the expansion of academic research in the 1980s was countered in the years around 1990 with accusations of overemphasis on research and under-emphasis on undergraduates. I have argued elsewhere that such a critique was simplistic and misleading. However, these oscillations in faculty effort, real or imagined, occurred with little change in faculty structure or roles. If National Survey of Postsecondary Faculty can be believed, faculty reverted to form in the 1990s, devoting more time to teaching and less to research.¹

This paper argues that conditions have changed—that the expansion of academic research since the late 1990s has been accompanied by forces that are driving a restructuring of faculty work. The purpose of this paper is to identify the changes now occurring and the forces behind them. The first section presents a conceptual scheme for analyzing the balance between research and instruction. The second examines factors in the research economy causing an intensification of research in faculty roles. The third examines changes in teaching roles and particularly the phenomenon of the full-time, fixed term faculty appointment. The final section documents the bifurcation of faculty roles and considers possible implications.

The Optimization Hypothesis

Universities are complex multipurpose organizations. Numerous models have been proposed to account for their behavior, and all seem to capture some important features.² However, at the most fundamental level universities generally seek to maximize learning—the learning of their faculty, the learning of students, and the sharing of learning with external actors, particularly in ways that contribute to internal learning. This view may not explain all university undertakings, but it is consistent with the thrust of most university behavior. Universities try to employ the most learned faculty possible; they prefer and seek the best learners for their students. Universities are generally willing to assume other functions that contribute in some way to learning, like agricultural experiment stations, special library collections, or research for the Department of Defense. Conversely, they avoid providing services that offer no learning feedback; or, if need be, seal them off as auxiliary enterprises that make no claims on general funds. Prestige maximization has often been posited as the driver of university behavior, but in this view learning is the most powerful underlying source of prestige. Similarly,
resources are obviously essential for universities, but prestige based on learning is the surest means for securing the revenues and supplemental income that bolster university quality. The most learned American universities are ultimately the most admired institutions, domestically and globally.

For present purposes, the two central activities of universities are the advancement of learning through research, scholarship, and research-based graduate education, and conveying learning through instruction for non-research degrees. Research and teaching: these are the principal outputs of universities and the principal components of the faculty role. Since both contribute to learning, how do universities determine how much of each to produce?

Several decades ago, economist Marc Nerlove posed this question in a different context. As part of his analysis, he offered the following diagram.3

Figure 1. Combinations of research/graduate education and non-research education

This Figure, which expresses hypothetical amounts of “value-adjusted units” devoted to research and teaching, suggests several interesting relationships.

First, in the regions near the x and y axes, teaching and research are depicted as being complementary, so that additions of the smaller component produce a cost-free increase in the other. For example, major medical schools, which resemble enormous
research institutes, are able to offer education at small cost and in ways that should benefit research. Along the other axis, colleges that offer no provision for research might add small amounts of faculty research that would contribute to upgrading educational services.

Second, in the region where universities operate (between A and B), research and teaching are substitutes for one another. However, Nerlove is not implying a teaching-versus-research scenario. Rather, he posits that universities choose a combination that optimizes the outputs of both teaching and research. This **optimization hypothesis** makes good sense if one considers what universities are able to do with given resources, not what they might wish to do. A university might wish to perform more research, but be unable to invest in the research capacity that this would require. Similarly, universities would no doubt like to improve the quality of educational services, but most lack the wherewithal to make those investments too. In the real world, universities satisfice, or optimize these outputs.

Third, Nerlove argues that an increased social provision of academic research “may well have the effect of making the provision of undergraduate education more expensive, but this increase in cost is desirable from society’s point of view.” By increased cost, Nerlove means employing greater resources, so that the value of educational services would also increase. Additional resources do not come entirely from research funds, but from universities seeking to optimize their outputs.

How, we might ask, does this relate to the real world? One critical question is to what extent research and teaching are substituted for one another.

Consider a simple example. If I were suddenly to receive a research grant that would buy out my two courses for next Fall, the department would scramble to find replacement teachers. Most likely they would be part-time teachers or, for undergraduate courses, graduate teaching assistants. Although my replacements might be terrific teachers, they would be paid far less than a full professor. In Nerlove’s value-adjusted units, this would represent a diminished input to teaching—a substitution of research for teaching. Such a shift is illustrated in Figure 2 by movement from points A to B.

Substitution clearly takes place in the short run, but does it also occur longer term? In *Knowledge and Money* I presented two cases where substitution occurred as institutional policy. In the first, a public university rose to distinction in the 1970s, but found its budgets badly squeezed in the 1980s. With a captive clientele of in-state students, it was insulated from competition for undergraduate enrollments. To preserve its academic prestige, it deployed more valuable resources for research-related purposes, and used less valuable resources for undergraduate education. The university’s optimal balance of outputs appeared to rotate counter-clockwise. However, this development soon caused a reaction—not in the student market but in the political arena. Accused of neglecting undergraduate education, the university was compelled by its governing board to increase investments in that area substantially. This was done in ways that were intended not to diminish (substitute for) research and threaten its reputation.
In the second case, a private university that was losing its competitiveness in the admissions market consciously determined to raise its profile for undergraduate teaching. Given limited resources, this was done by substitution—by cutting resources for research. The optimal balance rotated clockwise in this case toward greater teaching and less research. This strategy accomplished its purpose, raising tuition income and selectivity, but essentially abandoning research in several areas. This movement also brought a reaction. Once the university had improved its position in undergraduate recruitment, and bolstered its finances, it announced the need to direct increased investments toward research. Again, this was envisioned to occur through additions, not substitution.

Figure 2.

Princeton supplies an additional example of enhancing the output of instruction. In 2000 it resolved to increase undergraduate enrollments by 500. This was justified as a correction to a long-term upward creep in graduate/research education. No cutbacks in research were envisioned, but clearly the university intended to increase the weight of undergraduate education in its optimal balance.6

Both research and teaching are powerfully supported not only within universities but by markets and influential external actors. However, teaching and research represent different organizational models. Universities control their output of teaching directly by
adjusting the organizational resources devoted to that end, as Princeton did. Research, however, is a two-step model. Universities make internal investments with the expectation that they will attract external support for research. Although the research economy is relatively stable (despite perpetual complaints to the contrary), there is still a degree of uncertainty. Hence the optimal balance of teaching and research might fluctuate somewhat in the short run. However, in the long run both are stabilized by more powerful dynamics.

As universities seek to maximize their learning and prestige, they try to hire the highest quality faculty members that are available. If successful, they should over time enhance research capacity—replacing less capable scholars and researchers with more capable ones or making net new additions. (This assumes that the supply of high quality academic labor exceeds demand, which will be seen below.) Thus, competently run universities should be able to expand their research capacity over time and, given an expanding research economy, their research expenditures as well.

At the same time, universities have a largely fixed amount of teaching output that cannot be easily reduced. Moreover, any public questioning of teaching quality would be severely punished in the student marketplace. Thus, the secular expansion of research does not take place by substitution, but rather by the expansion of value in both research and teaching (Figure 2). Hence, Nerlove’s assertion that more research makes undergraduate education more expensive, and that this is socially desirable. That something like this has actually occurred can be shown with a few figures:

Table 1. Change in Teaching, Research, and Spending at 33 Private and 66 Public Universities, 1980-2000.

<table>
<thead>
<tr>
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<th>Private</th>
<th>Public</th>
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<tbody>
<tr>
<td><strong>Enrollments</strong></td>
<td></td>
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<tr>
<td>1980 (FTE)</td>
<td>335,378</td>
<td>1,391,422</td>
</tr>
<tr>
<td>2000 (FTE)</td>
<td>390,827</td>
<td>1,593,873</td>
</tr>
<tr>
<td><strong>Change</strong></td>
<td>16.5%</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Faculty</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980 (regular)</td>
<td>15,195</td>
<td>63,983</td>
</tr>
<tr>
<td>2000 (regular)</td>
<td>18,266</td>
<td>70,419</td>
</tr>
<tr>
<td><strong>Change</strong></td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Research</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980 (billions of 1996$)</td>
<td>$3.25</td>
<td>$6.03</td>
</tr>
<tr>
<td>2000 (billions of 1996$)</td>
<td>$6.65</td>
<td>$14.54</td>
</tr>
<tr>
<td><strong>Change</strong></td>
<td>105%</td>
<td>141%</td>
</tr>
<tr>
<td><strong>Spending/Student</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980 (2000$)</td>
<td>$10,100</td>
<td>$8,900</td>
</tr>
<tr>
<td>2000 (2000$)</td>
<td>$24,100</td>
<td>$14,900</td>
</tr>
<tr>
<td><strong>Change</strong></td>
<td>139%</td>
<td>67%</td>
</tr>
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Source: *Knowledge & Money*, pp. 32, 147.
Over two decades, the increase in tenure-line faculty at both public and private research universities was roughly proportional to the increase in enrollments. At the same time, the amount of research performed—and the amount of research per faculty member—was far greater. We can probably infer that more faculty were engaged in separately budgeted research, and that active researchers had become even more so. However, non-research spending of general funds increased as well—more than research at private universities and less than research at public ones. In value-adjusted units, therefore, teaching inputs increased too. These developments might correspond with Nerlove’s outer curve (T3) in Figure 2.

The dynamics behind these developments can be understood most readily for private research universities. These two decades concluded with a period of extraordinary prosperity for these institutions, based largely on increasing tuition revenues and generous alumni support. In other words, the goose laying the golden eggs was the undergraduate college. Excellence in research burnished prestige, which helped to enhance the attractiveness of these institutions, but volume of research was less critical. Universities thus spent their growing revenues on both education and research quality, but research expenditures rose less than the national university research economy. These universities ceded one percent of their research share in non-medical fields every five years from 1980 to 2000. Given their growing prosperity, one can only assume that they considered their research output to be optimal even though it was growing more slowly than average. However, for reasons explored below, this relative underperformance of non-medical research may be less tenable under present conditions.

The Intensification of Research

Academic trends may be slow to develop and long to persist, but one can sometimes perceive a tipping point where certain ideas begins to dominate the thinking of universities and their actions. Such a point occurred around the turn of the twenty-first century when a consensus emerged inside and outside of higher education around the belief that the contribution of university research to economic development was crucial to the global competitiveness of the U.S. economy. This particular movement coalesced with several other existing trends in ways that are barely separable: interdisciplinarity, the proliferation of research institutes, and what might be called ‘raising the bar’ in faculty hiring.

These trends have been backed by forces that universities can scarcely resist. The science agencies of the federal government, led by NSF, have tied major programs and center grants to collaboration with industry and translational research intended to yield inventions and innovations. Nearly every state government has created programs with multiple forms of support for technology-based economic development (TBED, pronounced tee-bed in the trade), and probably half of these provide explicit support for relevant forms of university research. Finally, in the knowledge base itself, science-based technologies, like the multiple strands of biotechnology and nanotechnology, not only
promise fruitful inventions arising from basic research, but also represent the cutting edge of scientific discovery. Together, this constellation of factors has been driving greater orientation toward research, at the margin, in faculty hiring and faculty work.

**Economic Development.** Federal research policies aimed at stimulating economic development have the same impact on universities as federally sponsored research. That is, they exert a powerful influence indirectly by shaping university behavior. Many state policies affect universities directly by supporting additional faculty or funding units intended to collaborate with local industries, foster innovation, and generate spin-off companies. Faculty members hired under such programs are expected to concentrate primarily on their research roles.

The most admired of these initiatives is the Eminent Scholars Program of the Georgia Research Alliance. It provides matching funds to create and endow professorships in economically relevant fields at the state’s principal universities. The matching funds are usually given by corporations, so that a working relationship with industry is assured from the outset. Similar state programs for hiring faculty in strategic fields now operate in South Carolina and New York.

Other state initiatives have provided support for the creation of large research institutes at universities in economically relevant areas. New York has several such programs, but its largest commitment has been to nanotechnology at the University of Albany. Arizona, in implementing its Bioscience Roadmap, has provided extra funds that were used for the huge new Biodesign Institute at Arizona State and additional institutes at the University of Arizona. Another economically inspired initiative is the Georgia Electronic Design Center at Georgia Tech. Originally intended to support new professors who would undergird the broadband industry in the state, it is now a large collaborative research unit with at least thirty participating faculty. California in 2000 launched the four large California Institutes for Science and Innovation spanning the UC system. Michigan’s truncated policies inspired the Life Sciences Institute at the University of Michigan, which hires faculty members in various departments with half-time research appointments in the Institute. All of these and similar units recruit regular faculty for substantial research commitments and usually provide partial support for salary and start-up costs. Teaching responsibilities no doubt vary, if they teach at all, but their primary responsibility is certainly research.

**Interdisciplinarity.** The mixing of disciplinary expertise has long been in fashion for both teaching and research. However, when curriculum committees recommend socio-economic-ethical-ecological perspectives for undergraduate courses, they generally turn to campus idealists to staff these creations. For research, multidisciplinary approaches are mandated by NSF for certain types of grants, or are inherently necessary for some investigation, especially in science-based technologies. Thus, when interdisciplinarity becomes an explicit factor in hiring faculty, the critical criterion becomes research.

For universities eager to become more interdisciplinary, superseding departmental control over faculty hiring has been a challenge. This generally requires that the central
administration provide additional resources to support the kinds of positions it wishes to create. These positions are defined in terms of the research expected by the new hires. Some of the specific strategies for doing this have been explored by Creso Sá of the University of Toronto. There seem to be two basic approaches: cluster hiring and hiring mediated through institutes.11

The University of Wisconsin may have been to first to undertake a cluster hiring initiative in 1999. It asked the faculty to define interdisciplinary clusters, and those approved were then funded by the provost. This fairly crude approach allowed for little strategic direction, and left open questions about subsequent administrative control. Florida State initiated a similar program in 2005. At UC Berkeley, numerous rounds of negotiations eventually defined four interdisciplinary areas for additional appointments. This was a laborious process, however, with meager results. RPI has implemented one of the most determined strategies for building faculty ‘constellations’ in biotechnology and information technology.

Penn State began in the 1990s to coordinate interdisciplinary hiring through several overarching institutes. With the central administration promising half the support, departments were invited to define faculty positions that would engage in cross-disciplinary research through the institutes. After five years, if interdisciplinary research was no longer being pursued, the university would withdraw its support. More recently, the university has undertaken a major initiative in energy research. Using this basic approach, and with some state support, the Energy Institute has committed to fill twelve new positions in fuel sciences. Although new curriculum is proposed as well, these faculty members will be doing far more research than teaching.

Research institutes. Much has already been said about the role of research institutes. They have existed since the Harvard Observatory was opened in 1847. When I last wrote about them almost two decades ago, they continued to suffer from two major problems: the inability to influence departmental hiring, and thus to perpetuate their own special competencies as personnel changed; and the equivocal status of full-time researchers, sometimes called the ‘unfaculty.’ These conditions have changed. Contemporary universities for the most part do not wish to make non-faculty research appointments, but prefer positions with full faculty status. And, as just seen, institutes now are sometimes given an active role in hiring. These procedural changes are only part of a larger structural transformation.

First, there has been a proliferation of university centers and institutes. Not only are they growing in numbers, but spreading to all academic fields. The Humanities, always fearful of neglect, well illustrate this trend. In 1992, 53 universities registered centers or institutes devoted to the Humanities. These units, moreover, were recipients of a steady stream of major gifts. In 2008, there were 121 such centers. By any reckoning, opportunities for faculty research and scholarship had expanded impressively.12

The essential function of centers and institutes is to facilitate research in a defined area and often to serve as conduit for external relationships. Often ongoing projects are
conducted by a director and core faculty. But institutes also provide resources for a wider group of faculty (and often visiting faculty from other institutions). They offer services for the preparation and administration of grants, sometimes seed money for developing proposals, and opportunities to participate in large institute grants. And, institutes play a crucial role in supporting graduate students. Faculty having access to institutes are more readily able to buy out teaching time with sponsored research. Major research universities now possess centers and institutes that provide nearly all of their faculty members with access to research units.

Thus, the second change has been an evolution away from the dichotomy of core departments and peripheral institutes and toward greater integration in a matrix type of organization. Increasingly, faculty define themselves by full membership in one academic department, joint appointments to other departments, and affiliation with one or more research units. Large medical schools have long operated on this basis. As universities evolve toward greater research outputs, they too have evolved toward a matrix organization. In addition, universities contain a variety of units that provide other types of services. These units represent another non-teaching dimension of the faculty role—one especially prominent in professional schools but not absent in the Arts and Sciences. In fact, it is somewhat misleading to classify these activities as teaching, research, or service, since these activities are often inherently intermingled. What they are not, however, is the traditional model of teaching college students in a classroom.

Raising the Bar. The difficulty of new PhDs obtaining academic appointments has been recognized for decades. The other consequence of this job queue has been less noticed—the fact that those who are appointed to tenure-line positions are likely to possess increasingly extensive research experience and accomplishments. Existing data on postdocs tells little about their subsequent employment. For a current snapshot, I performed my own micro-investigation. This pattern is best documented in the natural sciences, where postdoctoral appointments have become standard. At Pennsylvania State University, information was available for thirty assistant professors in biology, chemistry, and physics appointed in the College of Science from 2001 to 2006. On average, they had spent four years and ten months as postdocs—about the same amount of time most of them spent earning a Ph.D. A generation ago, a new assistant professor fresh from graduate school would have this much time to prepare for the sixth-year tenure review. Teaching experience was essentially absent from the post-graduate experience of these scientists. Including their Ph.D. research, they had been engaged in full time research for the previous 9-10 years. Well prepared, to say the least, they were unlikely to be distracted from pursuing further research. In fact, newly hired assistant professors are given extensive support, including relief from teaching, to establish their research—and this is true of all colleges in the university.

The clogged labor market for university faculty has had the effect of raising the bar for qualifications; and it also raised the bar for subsequent promotion to tenure. This upgrading of faculty research accomplishments was evident in the rise in departmental quality ratings from the 1982 to the 1995 Assessments; and it should be evident again when new departmental ratings appear in 2008. This is a positive development from the
perspective of American science, although the negative side effects have been cause for complaints. Proposal pressure at federal science agencies has reached troubling levels. And the unattractiveness of careers in science may be one reason why less than half of the thirty scientists hired at Penn State were Americans.

The four factors identified here as furthering the intensification of research are ultimately part of a larger transformation taking place. Universities are basically increasing their outputs of research, with strong encouragement from American society, and looking to their faculty for greater productivity. The optimal output level for research has clearly risen, but how has that affected the output of teaching?

Restructuring Teaching Roles

A former provost once told me: “if you want to increase research, hire more regular faculty; if you want to increase teaching, hire fixed-term teachers.” In fact, this is what universities have been doing—appointing full-time, non-tenure track faculty (Figure 3), whether to compensate for the teaching deficit as regular faculty devote greater effort to research, to preserve flexibility, or to limit faculty payrolls.

Figure 3.

Figure 3 shows the proportion of FTNTT faculty rising to 24.4 percent at private universities and 20.5 percent at public ones. In both sectors, what had been a minor trend in the 1990s accelerated after 2000. Since that date, twice as many additional full-time positions were off the tenure track as were on it (6,000 vs. 11,000 at public universities; 2,000 vs. 5,000 at privates). Since FTNTT instructors have been hired solely to teach, they account for 2-3 times as many credit hours on average as regular faculty members. Collectively, they teach a substantially higher proportion of student credit hours than numbers alone would indicate (see below). This bifurcation of the faculty raises numerous issues—on both sides of this divide.
The job of tenure-track university professor is unique in the amount of continual investment made by employers in the human capital, or intellectual growth, of the employee. These investments include a generous amount of time expected to be allocated for scholarship and research, about 40 percent of the year entirely free from assigned work, paid leaves for intellectual development, and the supporting infrastructure of libraries, laboratories, and information/communication technology. The quid pro quo, of course, is that these resources will be employed to develop a very high level of expertise in a specialized field, and to employ that expertise to advance the field through research and publications, and sometimes to share that knowledge through service—in addition to teaching. Individuals who meet these criteria are rewarded with tenure, and the university continues to invest in their knowledge growth until retirement.

As the faculty role becomes more research intensive, structural changes become increasingly evident. Two strategies are apparent: staffing redundancy and reliance on full-time, non-tenure track (FTNTT) teachers.

Departments heavily engaged in sponsored research have long resorted to staffing redundancy by employing many more faculty members than are strictly needed to teach their courses. Of the trends reported above, economic development and interdisciplinarity essentially reinforce this pattern, while research institutes and raising the bar tend to spread it to more departments. My own department of ten faculty, for example, has theoretical ‘teaching power’ of 37 courses per year. My colleagues and I actually teach about 15. And it is still often difficult to cover these offerings. Without this redundancy it would be impossible to accommodate buy-outs, leaves, and other reductions in teaching loads.

Departments in which sponsored research creates fewer buyouts—humanities, social sciences, and business—have developed other coping strategies. They face a critical problem in the considerable cognitive distance that exists between faculty scholarship and undergraduate learning needs. Mathematics has long recruited part-time teachers to staff multiple introductory sections, as have English and foreign language departments to handle first-year language/writing courses. Now the same kind of problem is faced by prestigious economics departments, for example, which prefer to have professors focus on economic theory; or business schools, where esoteric faculty research bears little relation to the basic courses needed by a multitude of undergraduate majors. In such situations, departments have increasingly resorted to full-time, fixed-term faculty to fill the gap. In this way, these departments are able to utilize tenure-track faculty to teach advanced seminars, conduct research, and publish in leading journals, while still meeting student demand for basic courses.

A good deal has been written in recent years about part-time or contingent faculty. Part-time teachers are employed for a variety of reasons, both good and bad. Freshman math and language courses have already been mentioned. Sometimes, part-timers are used as short-term stopgaps to cover necessary courses (my windfall grant). All too often, they are employed to reduce costs. In many fields, they bring diverse perspectives and
real-world experience. With a partial exception for this last situation, employing large numbers of part-timers generally is believed to have adverse consequences for student learning. In fact, anyone familiar with departmental administration would no doubt agree that the variability in teaching effectiveness for part-timers is greater than for regular faculty.

Full-time, non-tenure track (FTNTT) faculty present a different case. They too have received some scholarly attention. However, the picture depicted by these studies is complicated by the different types of and reasons for these appointments.\(^2\) Six different situations have been identified.

- Senior lecturers: appointed for a limited duration to bring particular expertise to the curriculum.
- Clinical faculty: usually combine clinical teaching and service in applied settings.
- Professors of practice: appointed on the basis of their experience in the field.
- Under-credentialed faculty: appointed as instructors in fields like computer science where Ph.D.s may be in short supply for tenure-track appointments.
- Short-term fully credentialed teachers: elite private universities appoint recent Ph.D.s to temporary teaching positions to provide curricular enrichment and because no additional tenure slots are available in distinguished, tenured-up departments.
- Fully credentialed fixed-term teachers: appointed with single- or multi-year contracts to provide flexibility and possibly cost savings by fulfilling demand for undergraduate or lower division courses.

Good reasons can be offered for the first five types of appointment, based on the special needs of professional programs, in particular, the diverse experiences such appointments can bring, or necessity. However, the last type, labeled the “the marginalized model,” raises concerns. The AAUP has been particularly critical:

Nontenure-track appointments do considerable damage both to principles of academic freedom and tenure and to the quality of our academic institutions—not to mention the adverse consequences for the individuals serving in such appointments.\(^2\)

Nevertheless, in some cases these appointments too can be justified. If they consolidate part-time positions, they should actually improve instruction. Where individuals understand that they will be expected to concentrate their efforts on instructing students, they may be fully devoted to the task, presumably enjoy undergraduate teaching, and might be more effective teachers. Perhaps the strongest argument is that teaching lecture courses of several hundred students takes special skills that these instructors develop. At least, that is the hope.

Still, the longer-term drawbacks to this type of appointment would seem to outweigh any short-term benefits.
Numerous studies have shown that student engagement with faculty members has positive effects on student learning and outcomes. Adjunct and part-time faculty might be expected to be less engaged with students, and hence less effective in promoting student learning. Attempts to determine the effects of contingent faculty have largely focused on part-time teachers. Increased use of part-time teachers was associated with reduced rates for completing associate degrees in one study and reduced rates of subject continuation in another. The only study to estimate the effects of FTNTT faculty found effects on graduation rates to be more negative than those of part-time teachers. The reported effects are small, and confounding variables large, but existing studies all point in the same negative direction.

Traditional practice would seem to argue that on balance arts and sciences courses, even lower division ones, are better taught by tenure-track faculty who are active in research and scholarship. In the nineteenth century, educational leaders like Charles W. Eliot could speak with great confidence of the inherent differences between the practical and the liberal arts. This distinction can only be made with much greater qualification in the twenty-first century. The practical arts require that students acquire a good deal of codified knowledge in introductory courses. Probably this type of knowledge can be conveyed adequately by teachers without research qualifications or, for that matter, online. While basic knowledge in the liberal arts disciplines has been codified to some extent, these subjects should be taught to university students with some degree of depth and nuance, which requires teachers who have a deep knowledge of their subject acquired through active scholarship.

These adverse effects on student learning cannot be viewed in isolation. There could be offsetting effects that would have positive influences on learning, like additional teachers to provide smaller classes or a richer advanced curriculum. Furthermore, it can be argued that FTNTT teachers should improve student learning if they replace part-time faculty, as seems to be the case (see below). It is possible that FTNTT faculty are more dedicated teachers, and thus preferable to scholars who may resent teaching basic subjects, perform lackadaisically, or rely excessively on teaching assistants. However, a different set of considerations pertains to the effects on the faculty and the institution.

Most basic, universities do not invest in the intellectual growth of FTNTT faculty. Departments may assist them to attend professional conferences, but the substantial allocation of time for research and graduate education (and GRAs) is lacking. Faculty fresh from graduate school may still be familiar with the frontiers of disciplinary knowledge, but longer term the different slate of activities will make it increasingly difficult for them to stay abreast. In most cases, FTNTT teachers are hired to be generalists, precisely the role that specialized regular faculty disdain. Thus, for those who are hopeful of eventually joining the tenure track, this possibility becomes more remote over time.

The growing distance from the research frontiers is just one source of a pronounced status differential between a tenure track and non-tenure track faculty member. After all, the essential situation is that one has been hired to teach the least
attractive courses so that the other can have more freedom for research and publication. Lack of involvement with graduate students is another status marker, one to which undergraduates have been found to be sensitive. Departments can and sometimes do take steps to mitigate this status differential, but it is fundamental to this situation and fundamentally unhealthy as well.

The positions given to FTNTT appointments are to some extent subtracted from the regular academic market, as implied in Figure 3. The clogged academic job markets provide the excess manpower that makes non-tenured appointments possible; but these appointments in turn reduce the number of tenure-track positions. This situation represents a profound change from the academic labor market of a generation ago, where new Ph.D.s were hired in greater numbers and given the opportunity to compete for coveted tenured slots. Today, large numbers of aspiring academics in clogged fields never get that chance.

Why, then, is the trend toward FTNTT faculty growing? One study found the practice most prevalent at Master’s-level institutions, where it would probably be motivated by financial factors. At research universities, a more complicated dynamic seems likely. The intensification of research at public universities, in particular, has been accompanied by persistent underfunding. The result has often been a squeeze on the budgets of colleges and departments. Sometimes the funds available to cover their teaching obligations are provided on a short-term basis, and hence cannot be used for long-term, tenure-track commitments. Also, competitive pressures have been reducing the teaching loads of regular faculty. Under these conditions, colleges and departments have resorted to appointing FTNTT faculty in order to meet undergraduate teaching obligations. FTNTT hires appear to be the path of least resistance. However, this also means that the hiring rationale and the work of FTNTT teachers vary across academic departments.

Restructuring the Faculty Role?

If growing staffing redundancy in some departments represents the intensification of research, the increasing hiring of FTNTT faculty represents a compensatory effort to maintain or strengthen the output of teaching. In terms of the optimization hypothesis, universities have sought to substantially increase their outputs of research, but not to detract from their instructional role. Indeed, they learned from the university- and research-bashing that took place, c. 1990, that they would pay a high price for any suspicion of neglect of their teaching mission. Moreover, economics (resource dependency) sends the same message, perhaps more forcefully. Public universities are now heavily dependent on tuition revenues, just like privates. And after tuition, both public and private universities look to the good will and generosity of alumni. A visible substitution of research for teaching is not an option.

In the larger picture, the trends described here actually represent a substantial augmenting of instructional output (in ‘value-adjusted units’). The intensification of
research has significant spillovers for instruction. The most important of these is the increase in the learning of the faculty through ‘raising the bar’ and access to institutes. The appointment of ‘non-marginalized’ FTNTT faculty is intended—ignoring mixed motives—to enrich the curriculum with professors of practice or young academics who can profess trendy topics with youthful energy. The most problematic use of FTNTT teachers—for high-enrollment, lower-division courses, or the ‘marginalized model’—is sometimes defended as improving instruction or shoring up areas of traditional weakness in the university curriculum. Evidence suggests that this type of FTNTT faculty is leading the current expansion.

The following data provide a closer view of this phenomenon. At this public university FTNTT appointments constitute 25 percent of full-time faculty, slightly above the university average (Figure 3). However, the consequences for instruction are concentrated in a few colleges where the impact is large and growing.

**Figure 4.**

![Public Research University, Change in % of Credit Hours by Faculty Type](image)

Figure 4 shows the change in student credit hours—i.e. instruction consumed by students—by the three principal categories of instructors (some minor categories are ignored) at a major public research university. In just fourteen years, credit hours taught by regular faculty declined from 55 percent to 40 percent. Credit hours by taught by FTNTT faculty tripled from 11 percent to 33 percent. That gain reflected 15 percent of teaching removed from regular faculty and 8 percent of teaching transferred from part-time teachers. Moreover, the shift from regular to FTNTT faculty accelerated in the 1999-2006 timeframe. Just three areas account for two thirds of the credit hours taught by FTNTT faculty—liberal arts, natural sciences, and business (Figures 5, 6 & 7).
Liberal arts departments have long endured the brunt of responsibility for providing basic and general education courses for increasing numbers of undergraduates. At the same time, these departments have sought to raise their academic stature by recruiting and retaining distinguished scholars. In the years covered in Figure 5, these departments have shed about ten regular faculty positions and added 150 additional FTNTT positions, making the latter 39 percent of full-time faculty. Regular faculty have a teaching load of four courses per year, or less; FTNTT lecturers usually teach six courses, and possibly as many as eight. Since they mostly teach lecture courses, FTNTT instructors teach almost three times more students, on average. Regular faculty teach 27 percent fewer student credit hours than in 1992. Even part-time instructors (now mostly grad assistants) teach more credit hours than regular faculty. Given the large number of sections to teach and limited budgets, liberal arts departments could not possibly cover their courses with regular faculty.

Natural science departments bear a smaller burden of general education courses for non-science majors but still must lecture to large introductory courses. They increased the use of FTNTT instructors in the late 1990s when 15 percent of teaching was shifted onto these teachers despite no increase in the total teaching load. Since 1999 there has been a drift in that direction (c. 1 percent per year) but relatively little change. These departments have added almost as many regular faculty positions as those for FTNTT (24 vs. 32), which probably reflects staffing redundancy and the growth in external research support. FTNTT instructors are used primarily to teach lab sections and to coordinate
large lectures. In at least one department, a deliberate decision was made to hire instructional faculty to strengthen undergraduate laboratory instruction. In other departments FTNTT instructors also teach general education courses. Scientists generally prefer that regular faculty lecture to the introductory courses for science majors. Thus, science departments appear to have preserved a traditional faculty structure with only minor adaptations.

Business has undergone the most drastic shift to FTNTT teachers during this period. Regular faculty positions dropped by 21 and FTNTT instructors increased by 23, while total credit hours actually fell. For business departments, the key to rankings and prestige are MBA programs, and they in turn are rated in part by the scholarly productivity (or notoriety) of the faculty. This appears to be rational behavior, as recent research has found academic publishing to be positively associated in MBA programs with increases in rankings, student selectivity, and the starting salaries of graduates. However, these conditions have induced an intense competition for productive scholars that has driven salaries sky high and workloads to rock bottom. At the same time, undergraduate majors and minors produce very large enrollments in required courses like accounting, management, and finance. These are now taught by FTNTT instructors, who teach three times as many students as tenure-track colleagues.

There are similarities and significant differences in the ways these three fields have structured their full-time faculty. All have to deal with budgetary limitations, high undergraduate teaching responsibilities, and a highly competitive market for academic status. In this sense, these patterns stem from a university policy that favors employing limited resources to achieve academic distinction. This policy, however, reflects a paradox: a loss of academic reputation would be injurious to all concerned, including undergraduates. Perhaps they derive greater benefit from the prestige of the institution than from the qualifications of their instructors. This would seem to be the position assumed by liberal arts and business. The decisions taken by liberal arts departments reflect the necessity of coping with a huge teaching burden while defending scholarly reputations. They have chosen a bifurcated faculty even while recognizing that the large number of FTNTT instructors will not contribute to their national stature. The path of least resistance, perhaps, but any other course might have diluted the faculty with little gain for undergraduate teaching.

Business departments have pursued this path more ruthlessly and under somewhat less pressure. Their goal was clearly to build the reputation of the regular faculty, the MBA program, and the business school. They have sought to choke off the demand for undergraduate courses (declining credit hours) and to consign necessary courses to FTNTT instructors. In both business and liberal arts it would appear that research is being substituted for teaching in value-adjusted units.

This has not been the case in natural science departments. Scientists in general have a greater concern for the quality of undergraduate education. They are natural proselytizers and elitists who are greatly concerned to see strong students ‘go into science.’ They originally resorted to FTNTT appointments to counteract a perceived
deterioration of undergraduate instruction caused by the expansion of research. They regard their instructional faculty as specialists in undergraduate education and, in that respect, partners with the regular faculty. Since the scientific departments have more staffing redundancy and less budgetary pressure, their more limited use of FTNTT faculty seems to be a reasoned choice. They have expanded the *value-adjusted units* devoted to teaching.

In one respect the use of FTNTT faculty is a grassroots phenomenon that needs to be understood at the departmental level. However, it is also a national trend. Thus, the data from this public university exemplifies both aspects of this phenomenon. Most disturbing are the magnitude and speed of these developments. At bottom, the more the use of FTNTT faculty is practiced and legitimized, the more the traditional role of tenured and tenure-track faculty is likely to be undermined. Already, tenure-track faculty are a minority of the professoriate when part-time faculty are counted. But, the trend is more worrisome than the numbers. The intensification of research, highlighted in this paper, is only one of the forces pushing colleges and departments to turn to FTNTT faculty.

From this perspective, the erosion of the traditional faculty role is most problematic in the humanities and social sciences. There, the persistent oversupply of PhDs has been a prerequisite for these developments. Since the collapse of liberal arts majors in the 1970s, the vitality of those subjects has been buoyed principally by the selective sectors of higher education—private research universities, liberal arts colleges, and public research universities. In fact, the strong support for the traditional faculty role by these highly regarded institutions is probably its greatest strength. Nonetheless, the dynamics may be somewhat different in the two sectors. Private institutions tend to concentrate on sustaining a prestigious core faculty in their departments, but are also quite conservative about the number of tenured slots. They may resort to a variety of non-tenured appointments to provide variety and enrichment, but safeguarding flexibility and controlling costs are likely the primary considerations. Low student-teacher ratios provide additional flexibility for their privileged tenure-line faculty to expand their research. Public universities have relatively high student-teacher ratios combined with greater incentives to conduct research. They consequently resort out of necessity to non-tenured teachers to cover basic instruction in lower-division courses, with no pretense of curricular enrichment. Both these dynamics serve to erode the base of tenured faculty and increase the separation, in tasks and status, of tenured and non-tenured faculty. The question for the future, given the shrinking base of tenure-track faculty, is how close are we to a tipping point that would radically undermine the traditional faculty role? How long can the center hold?
Notes


4 Ibid., p. S204.

5 Geiger, *Knowledge and Money*, chapter 3.

6 Geiger, *Knowledge and Money*, p. 64.

7 Geiger, *Knowledge and Money*, pp. 153-59. Medical research has little connection with instruction and volume counts. For many private universities, most funded research is in biomedical fields.

8 This subject is analyzed in depth in our study: Roger L. Geiger and Creso Sá, *Tapping the Riches of Science: American Universities and the Promise of Economic Growth* (Cambridge: Harvard University Press, 2008).

9 Geiger and Sá, *Tapping the Riches of Science*; for TBED, see *SSTI Weekly Digest*.

10 E.g., consider this description of the Centenary Plan at the University of South Carolina: ‘Representing a $30-million investment in intellectual capital, the Centenary Plan has recruited 100 new faculty members who will shape research initiatives in the University’s four core research areas—Future Fuels™, the environment, health sciences, and nanoscience and technology. Buoyed by strong University support in the initial years, Centenary faculty are expected to become independent investigators who earn significant grant funding to support their scholarly endeavors. The ultimate goal is for each Centenary faculty member to be self-supporting within five years.

“Because our Centenary faculty will mature in an entrepreneurial culture where investment in the commercialization of intellectual property is the rule rather than the exception, the result is economic development for the people of South Carolina,” says Harris Pastides, South Carolina's vice president for research and health sciences.’

11 Creso Sá, “Interdisciplinary ‘Contracts’ and ‘Contests’: Strategic Faculty Hiring in Two Public Research Universities,” ms. OISE, University of Toronto.


14 For 2005, NSF reported 48,000 postdocs, five-eighths of them in biology and medicine. A National Academy of Sciences study in the 1990s found the average length of time as a postdoc was 3.8 years for biological scientists, but that figure would undoubtedly be higher in 2008. See, Richard B. Freeman, et al., “Careers and Rewards in the Bio Sciences: the disconnect between scientific progress and career advancement,” ms. (August, 2001).
Profiles of new faculty are published in *Science Journal* of the Eberly College of Science. Information was available for 30 of 31 junior appointments in biochemistry, biology, chemistry and physics. Mathematicians tended to have both research and non-tenure teaching positions between Ph.D. and PSU appointment; only statisticians (not included) tended to receive faculty appointments directly after receiving a Ph.D.


Geiger, *Knowledge and Money*, p. 149.

The values in Figure 3 are derived from IPEDS data. These data can be accessed in different ways, which in some cases indicate higher percentages of FTNTT faculty. The values in Figure 3 were derived in ways to ensure comparability from 1992 to 2007.


Liang Zhang and Ronald G. Ehrenberg have estimated a salary differential of over $14,000 between tenure-track and non-tenure track faculty in 2006: “Faculty employment and R&D Expenditures at Research Universities,” ms. CHERI (November 12, 2006).


Ehrenberg and Zhang, “Do Tenured and Tenure-Track Faculty Matter?”


