

## **Adam Smith Goes to College: An Economist Becomes an Academic Administrator**

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**I** have conducted research and taught classes on the economics of higher education for almost 20 years. I spent the last three years as a senior central administrator and executive officer of Cornell University. A description of my administrative responsibilities as Vice President for Academic Programs, Planning and Budgeting at Cornell University can be found at my web page at ([www.ipr.cornell.edu/RGEsPage/Ronshome.html](http://www.ipr.cornell.edu/RGEsPage/Ronshome.html)). My experiences in this position opened my eyes to the use and uselessness of economic analysis in trying to help guide a major university and what I have learned is the focus of this essay.

I begin by asking whether it is useful to view universities in a utility-maximizing framework, as I and others have done in the past. I show that the way universities are organized often guarantees that the utility-maximizing model is unlikely to be the correct approach. I then proceed to discuss a number of resource allocation issues that we faced at Cornell and reflect upon how concepts that are obvious to economists, and that we teach in principles of economics courses, helped or hindered decision-making at the university. The message that I hope comes through is not that economic concepts are irrelevant in operating a university, but rather that it takes a long time to explain to all the actors in the system why they should matter and even longer to make them actually matter.

Most of the discussion draws from my experiences at Cornell University. Cornell is an institution that I love and that I have devoted most of my professional life to trying to help prosper. Hence, nothing that follows should be interpreted as a slap at that institution. Discussions with colleagues around the country, the won-

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derful essay by John Siegfried (1997) on academic economists as presidents and provosts, and Henry Rosovsky's (1990) discussion of professors and governance at Harvard, suggest that my experiences at Cornell are very typical.

### **Should Universities be Viewed as Utility-Maximizing Entities?**

Starting with the work of David Garvin (1980), academic economists have used utility-maximizing models of behavior to try to explain the behavior of academic institutions. In Garvin's original work, utility functions for individual departments were aggregated to obtain a utility function for an institution as a whole. Departments, and hence the institution, were assumed to maximize prestige and from this could be derived a whole set of implications for behavior. Garvin used such a model to explain changing patterns of graduate program prestige, the growth of new graduate programs, and resource allocation across departments.

I have used utility-maximizing models myself to explain how institutions should allocate scarce undergraduate financial aid dollars across different categories of students, and in doing so provided an early justification for what has become known as "preferential packaging" in the financial aid literature (Ehrenberg and Sherman, 1984), to explain why cutbacks in federal funding for one type of graduate student (for example, physical sciences) will result in changes in institutional support given to all categories of graduate students (Ehrenberg, Rees and Brewer, 1993) and more recently to talk about the likely future of research universities (Ehrenberg, 1997; see also James, 1990).

While such models are useful both in a normative sense and as analytical devices, they provide little guidance as to how many decisions are actually made at complex universities that have multiple colleges. To see this, consider the institutional structure of a typical university. The central administrative offices of the university include the president, provost, and all the administrative and support services: admissions, registrar, bursar, athletics, housing, dining, utilities, student services, grant administration, the campus store, information technology, telecommunications, libraries, and so on. Some of these services may be enterprises, which charge prices for their services and must at least break even. The rest of the university is made up of the individual undergraduate colleges, professional schools and graduate colleges of the university. In some universities, the graduate school, in which Ph.D. study is undertaken, is formally a separate college. In others, graduate study formally takes place in the other colleges.

The financial relations between the center and the colleges go a long way towards determining if the utility-maximizing model is relevant. Revenue comes into the university from sources such as tuition, government appropriations, endowment income, annual giving, enterprise income, research funding, continuing and executive education programs, and distance learning. At one extreme, all revenue flows to the center, which covers all of the central costs and then allocates the remaining revenue out to the colleges. At the other extreme, the university operates

as a set of "tubs," with each college keeping all the revenue it produces and remitting to the center only a sum sufficient to cover its share of the costs of the central administrative and support services. The latter approach is often called a "Responsibility Center Management" (RCM) approach to budgeting (Strauss, Curry and Whalen, 1996). Sometimes under a RCM model, the colleges remit to the center more than the funds necessary to cover their share of the administrative costs. The subsidy, or "franchise fee," that they send to the center can then be reallocated by the central administration across the colleges on a one-time or continuing basis to further institution-wide objectives.

Fund raising for current operating funds, building support, and endowment is often an activity that each college pursues, although access to major donors may be rationed by the center which tries both to match the donors' interests with the colleges' needs and to stress institutional priorities. In some universities, there is a "tax" placed on external gifts that come into the university, either in the form of a share of the gift, a share of the first year income that it provides or a share of its endowment return. Development officers hate such taxes, which they believe discourage donors from giving. Central administrators find them useful to further the objectives of the university, which may differ from the objectives of the donors, and to cover costs that gifts impose on the university as a whole. Similarly, while the university would like the annual giving and endowment it raises to be unrestricted in purpose, donors often have specific objectives in mind. To the extent that a donor's objective coincides with an institutional priority, the donation in practice proves to be unrestricted even though it goes to fund a very specific item; that is, it may simply free up internal funds that the institution would have used otherwise to be used elsewhere.

While the above paragraphs cannot do justice to the complexity of university budget-making, they should make clear that a utility-maximizing model of university behavior is most likely to be a useful way to derive predictions about university behavior in those cases in which the central administration makes unilateral decisions about behavior, such as undergraduate financial aid policies, and in situations in which the central university controls all of the revenue, or at least obtains a "franchise fee" from all of the tubs, and/or "captures" some fraction of the extra income/wealth that comes to the colleges from external donations. The utility-maximizing model also describes fairly well the behavior of small liberal arts colleges, which typically lack separate centers of power.

At my own university, the provost directly controls the budgets of only three of the ten colleges on the Ithaca campus. These three are the Colleges of Arts and Sciences, Engineering and Art, Architecture and Planning, and they are referred to as the "general purpose" colleges. The other seven colleges are tubs, either by statute (the four state-assisted statutory units at Cornell, the School of Industrial and Labor Relations and the Colleges of Agriculture and Life Sciences, Human Ecology, and Veterinary Medicine) or by trustee designation (the Schools of Law, Management, and Hotel Administration). Through a complicated cost-accounting scheme, the tubs are billed only for the average costs of the central and support

services provided to them, as well as for the “net” credit hours that their students take in the three general purpose colleges that the provost directly funds (net of the credit hours that the students from the general purpose colleges take in each of the tubs). The center also does not “tax” the annual giving and endowments that the tub-like colleges obtain. Not surprisingly, given these rules Cornell has operated historically like a system of fiefdoms, rather than one university.

This problem is exacerbated by the method by which deans are selected. At Cornell, and many other universities, searches for college deans are conducted by committees that consist primarily of the faculty, and sometimes students and alumni, from the college in question. Although typically a few faculty and administrators from outside the college in question are on the committee and the president or provost nominally picks the dean from a small group of finalists recommended by the committee; in the main, it is the views of the search committee members that carry the day because the president and provost know from discussions of each candidate’s strengths and weaknesses who the committee really favors.

Once in office, a primary role for many deans is external relations, including fund-raising, and they build up strong external constituent support. Hence, it is unlikely that a dean would be censured or fired for focusing on the goals of the particular college and not worrying about the overall goals of the institution. Indeed, in many cases, once a dean is appointed, in the absence of discontent from the faculty and/or alumni of a college, the president and provost substantially lose the ability to influence a dean’s behavior. For example, during the summer of 1997, the president of Columbia University bowed to strong criticism from alumni and reappointed a college dean only a few days after dismissing him (Schneider, 1997). Similarly, in April 1998, the president of Georgetown bowed to alumni criticism, which included resignations from advisory boards and the threat of withholding large contributions, and reversed a decision not to reappoint a popular law school dean. It is believed that the dean’s unwillingness to share the law school’s revenue with the university precipitated the initial decision, although this was never confirmed by the university (Mangan, 1998).

Former Secretary of Labor Robert Reich (1997, pp. 150–51) had a passage in his recent book in which he described his reaction to attending a Cabinet meeting.

. . . Cabinet officers have nothing in common except the first word in our titles . . . even the formal titles belie reality. Each of us has a special responsibility for one slice of America. . . . I make a list of the real Cabinet . . .

Secretary of the Interior—Secretary of the West

Secretary of the Treasury—Secretary of Wall Street

Secretary of HUD—Secretary of Big Cities

Secretary of Agriculture—Secretary of Small Towns

Secretary of Commerce—Secretary of Corporate America

Secretary of Labor—Secretary of Blue-Collar America

And so forth . . . No wonder we rarely meet.

If one substitutes the words “Dean of . . .” or “Vice President of . . .” for Reich’s words “Secretary of . . .” and a college or administrative unit name for a cabinet department name, my sense is that his description also often applies to Cornell and to many other large universities.<sup>1</sup> Hence, the notion that we can treat these institutions as if they are seeking to maximize a well-defined objective function seems farfetched in many cases.

Indeed, inasmuch as university decision-making often consists of negotiations between various units, each motivated by its own self-interests, it may well be productive to apply formal bargaining models to the internal behavior of universities, just as these models have been applied with some success to the internal workings of families.<sup>2</sup> An alternative approach to understanding the behavior of universities that may prove useful is to think of them in the context of models of organizations and address how they seek to solve principal-agent problems between faculty and department chairs, department chairs and deans, and deans and central administrators, as Masten (1997, 1998) does. In future research I hope to use such models to provide a theory of how universities choose where to locate in the spectrum of centralized financial control and responsibility center management and to analyze whether the choice of organizational form influences a university’s “performance.”

I naïvely assumed when I agreed to help lead my university that my major contributions would come through my skills as an economist. While my skills as an economist were important, in truth, most of my major contributions depended upon my skills as a negotiator and mediator. Because multilateral negotiations take time and are likely to succeed only if, with the help of the parties, one can identify “win-win” situations, the number of major initiatives that an administrator can undertake is actually quite limited. The most frustrating lesson that I had to learn, which should have been obvious to an economist, was that constraints on my time limited what I could achieve as an administrator.

## **The Uses or Uselessness of Economics in University Decision-Making**

### **Relative Prices Should Matter**

Cornell has long been an institution that is known for its strengths in the physical sciences and engineering. The cost of conducting research in these areas has increased substantially as researchers have come to rely more on high technol-

<sup>1</sup> Rojas (1998) presents case studies of resource allocation at six unidentified private research universities that reinforce this sense.

<sup>2</sup> See, for example, McElroy (1990) and Lundberg and Pollak (1996). A key application of such models is in explaining household formation and divorce. Only rarely do individual colleges within a university contemplate separating from the larger university and only slightly more frequently do we see mergers of independent colleges.

ogy laboratories, as the federal government has cut back on permissible indirect cost recoveries and exerted increased pressure for matching funds as part of grant proposals, and as the start-up funds needed to attract young physical scientists and engineers have increased dramatically.<sup>3</sup>

One of the first things that economists teach undergraduate students is that relative prices matter and that as the relative price of something increases, one should substitute away from that commodity. Hence, it appeared quite obvious to me that, to the extent that the increased relative cost of the physical sciences and engineering is permanent, unless the marginal importance to the university of being preeminent in the physical sciences and engineering had also risen relative to the marginal importance of our being strong in other areas, we should seriously consider reducing our investments in engineering and the physical sciences and redirecting these saved resources to other areas.<sup>4</sup>

To even suggest this in the presence of faculty from these fields would have marked me as a very dangerous person in the administrative hierarchy. The notion of a university backing away from the areas in which it had been traditionally strong was not something that any physical scientist or engineer would rationally be willing to entertain. In fact, all of Cornell's six Nobel Prize-winning faculty during the last 30 years had come from physics and chemistry. By an ironic twist favoring our physical scientists and engineers, Cornell's president and provost are both humanists and, given the complaints by our physical scientists and engineers that they were not represented at the highest levels of Cornell's central administration, I suspect that neither is likely to want to bear the heat of suggesting that we should contemplate whether maintaining Cornell's relative investments in these areas made sense. Just as it took a Republican, Richard Nixon, to move the United States towards diplomatic relations with China and a Democrat, Bill Clinton, to end welfare as we knew it, it is my conjecture that Cornell will have to wait for a president who comes from the physical sciences or engineering before serious thoughts are given to reducing our emphasis on these areas.<sup>5</sup>

<sup>3</sup> Indirect, or overhead, costs are the expenses incurred by the university as a result of the sponsored research on campus that cannot be easily attributed to any specific project. These include, but are not limited to, research administration, depreciation, operation and maintenance of facilities and equipment, university computing and libraries. Cordes (1998) shows that the average indirect cost recovery rate at leading private research universities fell by 1.2 percentage points between fiscal years 1991 and 1997. At Cornell's private colleges (those other than the four statutory colleges) in Ithaca, the rate actually fell 13.9 percentage points. In contrast, on average, rates at public institutions rose during the period.

<sup>4</sup> It is often much harder to improve relatively weak departments than it is to maintain the strength of a top-rated department. A university's reputation also depends heavily on the reputation of its top departments. Hence, a case can be made that it would be prudent for Cornell to reduce its investment in the physical sciences and engineering areas only gradually. An observant reader might note that I have said nothing above about the implications of the rapidly rising costs of biological research. This is because perceptions of the relative benefits of being strong in biology have also increased due to the growing importance of biomedical research and the intellectual excitement caused by recent advances in biology.

<sup>5</sup> See Cukierman and Tommasi (1998) for a formal treatment of why substantial policy changes may be implemented by "unlikely" parties.

### **Buildings, Buildings, Buildings**

To remain preeminent in the physical sciences and engineering requires state-of-the-art facilities. These facilities are very expensive to construct, operate and maintain. When our engineering dean presented a proposal to develop a new facility to do research on advanced materials, we stressed to scientists around the university that we probably would build only one new science building during the next decade, and that they had better be sure that this was the one that would be of most use to them. We involved scientists from around the university in extensive discussions and everyone concluded that this indeed was the investment in science infrastructure that Cornell should be undertaking.

There is, of course, the matter of having to raise the money to put up the building. Furthermore, our trustees have long been aware that new buildings add to the operating and maintenance cost of the university. A rough estimate is that if the building was expected to have a total project cost of a given amount, it would take an equivalent endowment to provide the funds for utilities, custodial services, and routine and planned maintenance over the useful life of the building. This estimate derives from these costs averaging roughly 4 percent of the project costs and 4 percent is what Cornell "targets" as the annual payout, after investment expenses, on its endowment funds. To the extent that indirect cost recoveries could be used to defray some of these costs, the necessary endowment would be lower. However, our best estimate was that indirect cost recoveries could contribute at most one-third of the necessary operating and maintenance funds for the proposed building. This was an optimistic projection based on current indirect cost recovery rates, the assumption that all research space in the building would always be filled with funded research and that none of this research would be research that would have otherwise been conducted in other existing facilities.

Cornell's trustees have long required that a plan for meeting operating and maintenance costs be present before construction of a building can begin. Realistically, however, once a major donor has committed to funding half the cost of a building and it has been publicly announced that the building will be named after that donor, the idea that construction on the building would be held up because an endowment for maintenance had not been raised is a non sequitur. Furthermore, our ability to raise the additional construction costs, let alone the endowment for operations and maintenance, was somewhat uncertain and based upon forecasts of our development staff. So, while the university hoped that funds to endow a maintenance fund for the building will be raised, we instead planned to pay for the needed operating and maintenance funds that will not come out of indirect cost recoveries from our annual operating budgets.

Inevitably then, this new building will compete for funds with faculty positions, graduate student support and faculty salaries. The very same faculty members who vehemently argued that the institution needed the new facilities to remain competitive in the physical sciences and engineering are likely to turn around and chastise the administration for spending too much on buildings and not enough on faculty salaries, new faculty positions, and graduate student support. Proposals

for a moratorium on new construction will be put forth. Many faculty members understand the tradeoff between buildings and other costs, but apparently only *after* their unit's new building is finished.

This highlights a general point that will also be evident in several of the "vignettes" that follow. The university is an institution that is dedicated to rational discussion and intellectual exploration. However, often faculty members' self-interests prevent or delay them from recognizing obvious truths. This tension between the expressed values of the university and the internal political maneuvering that takes place within the institution is often present.

### **Faculty Salaries**

I take it as a fundamental proposition of faculty life that no matter what university one is at, the faculty believe that faculty salaries are too low. The Cornell administration actually happens to believe that this is true at Cornell and is making a determined effort to improve this situation. We reached this conclusion by tracking how our faculty salaries have changed relative to our competitors' faculty salaries over a number of years. In judging the "appropriate level" of our faculty salaries, we are cognizant of the fact that housing prices are low in Ithaca relative to those in our nation's largest cities in which many of the nation's premier institutions of higher education are located. Hence, we periodically hire a firm that specializes in computing how executives' salaries should be changed when their firms relocate them to different areas to compute cost of living indices for Cornell and our competitors.<sup>6</sup> Not surprisingly, a large fraction of the difference between our faculty members' salaries and those of faculty at competitor institutions can be explained by cost of living differences.

Faculty on our faculty budget committee, who tend not to be economists, view attempts to control for the cost of living as an administrative ploy to avoid raising their salaries sufficiently. One faculty member in a leadership position also insisted on comparing the faculty salaries of Cornell's endowed faculty (faculty employed in the private colleges at Cornell) only to the faculty salaries of faculty at other private universities. I patiently tried to explain to him that it is well-known that over the last decade the salaries of faculty at private research universities have risen relative to the salaries of faculty at public research universities, as states have run into fiscal problems and public higher education has faced competing demands for state funds from other public priorities like health care, welfare, and prisons (Bell, 1997). Moreover, in virtually all of the fields in which we employ faculty in the private part of Cornell, 40 to 60 percent of the leading competitor departments are located in public institutions. I presented him with data showing that faculty members who have left Cornell usually have gone to public institutions rather than private institutions and that at the new assistant professor level the public schools

<sup>6</sup> The index they developed is a fixed weight index, which has well-known problems, but I have judged it to be about as good as can be done. See Ehrenberg and Smith (1997, p. 33), for a discussion of the problems inherent in fixed weight price indices.



are often our competitors as well. Hence, I argued that his comparisons overstated the amount that our faculty salaries have fallen relative to our competitors' because his comparisons neglected all of public higher education. These analyses fell on deaf ears, either because I was wrong, because since I was temporarily an administrator I was perceived as being the enemy, or because the faculty member was up for re-election to his leadership position and had to appear to be a militant leader to be re-elected.<sup>7</sup>

We and our faculty observed that Cornell's faculty salaries are most competitive at the assistant professor and associate professor ranks and lag behind the competition the most at the full professor rank. This relationship is not surprising because it is at the former two ranks that we are competing most strenuously to attract and retain new and existing faculty and we have to meet the market in these circumstances. I dared not show the faculty committee my own research of some years ago that showed that the sensitivity of faculty turnover to relative salaries is higher for assistant professors than it is for associate professors and higher for associate professors than it is for full professors (Ehrenberg, Kasper and Rees, 1991). In fact, our deans who allocate salary funds are behaving perfectly rationally when they pay our assistant and associate professors relatively more than they pay our full professors vis-à-vis faculty at other institutions. In effect, they are exploiting the monopsony power that they have over their least mobile faculty. When they face the possibility of losing a desired senior faculty member, the deans have the flexibility to respond with a salary adjustment. As such, our overall turnover rate for tenured faculty members (excluding retirements) has been less than 1.5 percent a year for over a decade.

The vast majority of our faculty are full professors. The vast majority of faculty on our faculty budget committee are full professors. It is therefore not surprising that the faculty committee recommended that the salary pool that we deliver to them be heavily weighted towards full professors. Because of the fallout that we are experiencing from the end of mandatory retirement, I did not have the heart to tell them that such a policy may not be in the institution's best interest.

### **The End of Mandatory Retirement**

Effective January 1, 1994, faculty at American colleges and universities are no longer subject to mandatory retirement. Studies conducted prior to that time by

<sup>7</sup> There is a useful analogy here to Ashenfelter and Johnson's (1969) model of union behavior in which the objectives of union leaders and union members are assumed to diverge. The union members care about their salaries, while the leaders also care about the survival of the union and their personal political survival. Suppose that the union leader, after negotiating with management, realizes the "best" settlement likely to be obtained is below the union members' expectations. The leader can either try to "sell" this settlement to the members or take a militant stance and lead them out on a strike. Since the former strategy leaves union leaders open to the charge of "being in bed" with management, the latter is often the preferred strategy for leaders who want to remain in office. This model is described in detail in Ehrenberg and Smith (1997). Substitute the words "professor" for "union member," "faculty leader" for "union leader," and "university administration" for "management" and the analogy is clear.

Hammond and Morgan (1991) and by Rees and Smith (1991) had suggested that abolition of mandatory retirement would affect primarily major research universities, where faculty members are often so tied to their work that they can not conceive of leaving their jobs if they are not compelled to do so. In the private part of Cornell, prior to the abolition of mandatory retirement, two-thirds of our faculty retired prior to age 70 and the other one-third retired when compelled to do so at age 70. Since January 1, 1994, the behavior of the former group has not changed, but the behavior of the latter group has. In particular, members of this group have tended to stay on well past age 70.

Many of the faculty staying on beyond age 70 are among Cornell's best and brightest faculty and we are delighted to have them continually associated with the university. When they continue to draw a salary, however, the flow of new faculty into the university is slowed down and there is less money available to increase the salaries of other continuing faculty members each year. When a senior faculty member retires and is replaced by a lower paid assistant professor, the difference between the two salaries can be redistributed to other faculty in the form of salary increases. My calculations indicated that before the end of mandatory retirement, we were generating the equivalent of over a 1 percent salary increase for all continuing faculty each year due to retirements. An increase in the age at which faculty retire will reduce the size of this "self-financing" annual salary increase pool.

Because of these concerns, a joint faculty-administrative committee was appointed with me as chair to look into how the university should respond to the elimination of mandatory retirement. Our preliminary recommendations included that: the university should encourage faculty to use tax-sheltered retirement savings vehicles starting early in their life-cycle so that faculty who wanted to retire would have the resources to do so; the university should provide for a phased retirement option in which faculty members could work for up to five years half-time but receive full health and retirement benefits; and the university should drastically enhance the status of emeritus professors to help that position be seen as a desirable stage of a faculty member's career. We explicitly ruled out expensive buy out plans because evidence from a number of campuses suggests that those plans are not usually cost effective.<sup>8</sup> Finally, we suggested that if people were staying in faculty positions longer than had been expected, the university should consider capping its contributions into the faculty defined contribution retirement system, either after a specified number of years or, as Yale and Chicago have done, after the university's contributions, invested in some predetermined conservative manner,

<sup>8</sup> A recent retirement incentive plan at the University of California did induce substantial faculty retirements (Pencavel, 1998). However, the U.C. faculty were covered by a defined benefit plan and the cost of "sweetening" their benefits was borne by the state retirement system, not the university. For a discussion of why it is more difficult to "encourage" retirement when faculty are covered by a defined contribution retirement system rather than a defined benefit system, see Appendix B of our committee's preliminary report, available on the web at (<http://www.ipr.cornell.edu>).

generate an annuity at least equal to a specified percentage of the faculty member's final salary.<sup>9</sup>

Faculty response to our report was that the "carrots" we had proposed were too small; Congress had made tenure truly indefinite and we had to "buy out" their property rights if we wanted them to retire. Congress had given them enhanced rights; however, the notion that the university in its role as an employer could take actions to try to offset the effects of the change in the law was foreign to many of them. While economists who evaluate the effects of changes in federal policies such as the minimum wage often argue about what the magnitudes of employer responses actually are, no economist questions the right of employers to respond. In general, faculty do not think like economists and some faculty even asserted that if we tried to pursue policies to encourage voluntary retirement we would be violating the intent of the federal law. In fact, a provision in the bill passed by Congress in November 1998 to extend the Higher Education Act explicitly permits such policies for tenured faculty.

The faculty response to the one "stick" in the interim report, limitations on retirement contributions, is instructive. Many saw it as an attempt to cut total faculty compensation, even though it was explicit that any money saved would be used to provide benefits for emeritus faculty. Most could not comprehend that the contribution rates chosen by universities to make to their faculty members' retirement accounts were based on a number of assumptions including the expected age of retirement. To the extent that faculty are retiring later, a smaller contribution rate would be required to fund any desired level of annuity because the annuity would be paid out over a smaller number of years and because savings in the account would experience compound earnings tax-free over a longer number of years. Rather, faculty saw the contribution rate, rather than the implied annual pension benefit, as something that was due to them. Ultimately, given faculty perceptions that their salaries were too low (see above), we backed off this proposal in our final report.<sup>10</sup>

Although economists use several different models to conceptualize the existence of tenure—as McPherson and Schapiro indicate in their companion paper in this symposium—one that I often find useful is based on Lazear's (1979) model of mandatory retirement. To think about this in the simplest of terms, suppose a faculty member's productivity is constant over the life cycle (to avoid questions of the relationship between productivity and age) and that the faculty member is paid a salary that starts below the productivity level and then rises continually with experience. Suppose also that the present value of a faculty member's salary is higher with this increasing salary profile than it would be if the faculty member received

<sup>9</sup>The complete text of our April 1997 preliminary report is available on the web at (<http://www.ipr.cornell.edu>).

<sup>10</sup>Our November 1997 final report is also available at (<http://www.ipr.cornell.edu>). In May 1998, Cornell's provost announced the adoption of the recommendations contained in the final report as formal university policy. A more complete discussion of our analyses and recommendations is found in Ehrenberg, Matier and Fontanella (1998).

a salary equal to the constant productivity—assuming that the faculty member retires at, say, age 70. In such a world, the faculty member has an incentive to exert extra effort to earn tenure and get to the point on the salary profile at which salary exceeds productivity. After that point, the faculty member still has an incentive to work hard because tenure does not guarantee any real salary and, if the faculty member reneges on effort, the university has the freedom to reduce salary, at least by the rate of inflation. In such a world, both the university and the faculty member are better off than they would be in a world in which salary always equaled productivity, because the faculty member's present value of salary is higher under such a scheme and the university gets a greater output from the faculty member because of the induced extra effort.

Of course, for this model to make sense, mandatory retirement is needed so that the faculty member does not receive a salary greater than productivity indefinitely. Put another way, for this to be an equilibrium, the present value of the faculty member's marginal productivity over the life cycle must just equal the present value of salary over the life cycle. If the retirement age goes up, then to maintain the optimality of the model, either the number of faculty must fall or the level or the slope of the faculty salary profile must diminish. You can imagine what the response of our senior faculty who already felt that they are underpaid would have been if I suggested to them that, because of the abolition of mandatory retirement, perhaps our goal should be to reduce senior faculty salary increases rather than increasing them.<sup>11</sup>

### **Space Planning, Deferred Maintenance and Imperfect Information**

Early on in my term as an administrator, I inherited the "Sage shuffle." Sage Hall is a historic building on the Cornell campus that unfortunately needed about \$3.5 million in deferred maintenance expenditures to maintain it in usable, but outdated, condition. Such funds are not easily found in university annual operating budgets. (As one trustee said to me, students want low tuition, faculty want high salaries, and neither pushes for higher maintenance expenditures). Thus, at Cornell we have tended to fund deferred maintenance expenditures, such as the replacement of mechanical systems, as part of major renovations that modernize and improve the space within a building.<sup>12</sup> Given the historic nature of Sage Hall, historic preservation organizations had made sure that we did not have the option of totally tearing the building down and replacing it with a new one.

Cornell's Johnson Graduate School of Management, which had outgrown its space, was the only college on campus thought to have the donor base needed to

<sup>11</sup> See Appendix C of our preliminary report for a more complete discussion of the economics of the professorial employment relationship, available on the web at (<http://www.ipr.cornell.edu>).

<sup>12</sup> Cornell's trustees have taken it upon themselves to mandate that we spend more on planned maintenance than we would otherwise have done. Thus, relative to many other universities our buildings are now in relatively good shape. Of course, the extra funds we spend maintaining the buildings could have gone to faculty salaries or other current operating needs.

fund a major renovation of the building. Ultimately, a \$38 million project was undertaken which has now been completed. To renovate the building, we first had to move all of its current inhabitants (including the graduate school and a number of miscellaneous offices) out of the building and into other locations. A series of moves were set into place, which became known as "Sage shuffle" because other offices had to be vacated in turn to make room for those displaced from Sage Hall. When finished, these moves involved 26 different units and over 390 faculty and staff, as well as a roughly equivalent number of graduate students. Ultimately, this series of moves cost Cornell's current operating budget almost \$5.7 million, which far exceeded what the cost of simply making the deferred maintenance expenditures would have been. Of course, if Cornell had opted to make the deferred maintenance expenditures, rather than renovating the building, the university would have incurred some additional costs associated with temporarily housing residents of the building in other locations and would not have gained the benefits associated with a renovated facility.

As we neared the end of the series of moves, one important scheduled move was canceled because at the last minute a unit realized that it did not make sense for it to locate far from the dean who financed it. This cancellation caused us to scramble for other options. One proposal was to take a building that had been promised to a second unit and to move a third unit into that building as well. There was excess space in the building and the third unit could have been accommodated with some squeezing.

The director of the second unit came to my office and pounded his fist on my table, informing me that if he did not get all the space that he had been promised, he would resign. Because the provost told me that one of my roles was to solve, not create, problems for him, I swallowed hard, told the director that he could have the whole building and moved the third unit elsewhere. To do so generated much controversy, and in the process I had to "dump" on a nonacademic support unit that reported to me by moving them away from the center of campus. Two months later the director of the second unit was not reappointed by the vice president to whom he reported. In fact, the decision not to reappoint him had been made well in advance of the director's discussion with me, although he had not yet been informed.

Information does not always flow smoothly between university administrators who work for the same institution because there are too many things going on for them to be continually filling each other in on everything that each is doing. Imperfect information leads to less than optimal decisions. Conversely, information flows very quickly around the university whenever an administrator says anything, even in confidence, to any faculty member. This leads prudent administrators to "tell the same story" to everyone. However, since information flows are often less than perfect, multiple views on what the administrator said often arise even in this case. Thus, the optimal policy for an administrator is often to say nothing, even when the administrator has no desire to withhold information.

### **The Cost of Space**

Many observers of Cornell's financial situation have pointed to the costs associated with all of the buildings that Cornell has constructed and must maintain as limiting the university's ability to hold down tuition costs and raise faculty salaries. Using measures such as building space per student or faculty, Cornell does have more space than most of its competitors. Of course, it is difficult to hold all other relevant factors equal when comparing building space across universities. Some universities house all their students in university-owned buildings while others house few. The mix of undergraduate and graduate teaching and research varies across universities. The science intensity of different universities differs. Finally, some universities are located in urban areas where land is expensive and others, such as Cornell, are located in more rural surroundings, in which land for research facilities is less expensive. If Cornell has "too much space," part of the reason undoubtedly is that many users of space are totally unaware of the costs of the space that they occupy and bear none of the costs of the space directly.<sup>13</sup>

It seemed quite reasonable to me that we should attempt to compute the actual operating costs of the space each unit occupies. These costs would include the actual costs for routine and preventive maintenance, utilities and custodial services. Our building and grounds people tell us that to properly maintain buildings, approximately 1.5 percent of the replacement value of the building should be set aside each year for planned maintenance, and this too would be included in the cost. Certain overhead costs of buildings, including insurance and police and fire protection, would also have to be included.

Such estimates would have a number of uses. At the college level, such information would allow deans to identify the space costs associated with each of their departments just as they identify the number of faculty, teaching assistants, support personnel and other direct allocations. Deans, at least implicitly, base their allocation of faculty and other operating resources on the activity levels of their departments, such as students taught and external research funding, and having this information would allow them to do the same things with space.

To take another example, when I was discussing moving one unit into a building that had far more space than they currently occupied, the unit was not very anxious to share the building with a second unit, even though it still would be better off in the new location than in the current location. To encourage them to accept a shared arrangement, I suggested to them that I could compute the cost of the space that I wanted the second unit to occupy and reduce the operating budget

<sup>13</sup> As with most general statements about Cornell, this statement must be qualified. The designated colleges are billed directly for the operating and maintenance costs of their space (although planned maintenance is at their discretion). Statutory college costs are paid by state appropriations which to date have risen automatically when new construction or renovations are undertaken. Hence, the statement applies primarily to the endowed general purpose colleges and to individual departments and faculty members within each of the colleges. Faculty members with external research grants that provide for indirect cost recoveries are also implicitly billed for their space costs and the College of Agriculture and Life Sciences explicitly bills faculty for using some specialized facilities like greenhouses.

of the college in which the first unit was located by an equivalent amount. That is, I would "bill" their college for the space that they were refusing to give up in the new location and leave it to the college to decide whether the reduction in their budget would affect only the department. I had no authority to do this; however, faculty sometimes believe that administrators have more power than they actually do and my "threat" provided a strong incentive for the first unit to negotiate a compromise with the second, which was done. To have the ability to think systematically about trading off operating and space budgets in this manner should be very important to universities.

At the provost and deans' levels, such estimates are important to help the university understand the extent that cross-subsidies are occurring. Resource allocation decisions at universities should always be based on the academic values of the different activities; however, the monetary benefits and costs of the activities provide the context in which such decisions should be made. The systematic failure to include space costs in the calculations will cause a university to spend too much on activities that are space-intensive and that have high operating and maintenance costs per unit of space.

Finally, knowledge of space costs can be used to help ration space and curb people's appetites for space. Placing "prices" on space and permitting units to trade off spaces for operating budgets is likely to be an efficient way of carving out space and minimizing the need for new space.<sup>14</sup> While the argument is often made that freeing up only one or two contiguous offices does not always do the institution much good, in a world in which universities must worry about providing office space for emeritus faculty to encourage faculty retirement, even small contractions of space use would be very valuable to universities.

However, after two years of effort, I gave up trying to implement a space cost model for Cornell. Too many objections were raised to the details of the calculations that we were proposing to assure that the approach would have significant support to be adopted. One major set of criticisms revolved around our inability to distinguish whether "high cost" space was high cost because it was "high quality" or whether it was high cost because it was inefficiently designed. The problem could be addressed in theory, but was difficult to handle in practice.<sup>15</sup>

I met with the business officers for each college and they encouraged me to write a statement for the weekly faculty newspaper that would educate faculty about the costs of space. (Given the importance of getting faculty to think about this issue, I still intend to do this.) They indicated, however, they would not use space cost

<sup>14</sup> In this journal, Boyes and Happel (1989) describe how one economics department allocated faculty offices through an auction mechanism rather than by seniority or other means. The amount that faculty as a group have been willing to pay for offices has been used to support graduate students.

<sup>15</sup> One way an economist might get around this problem would be to develop a hedonic model of space costs that would enable one to "price" various characteristics—wet lab, air-conditioning, double pane windows, and so on—and then compute and assign the implied price of each specific space. Such an effort was far beyond the capabilities of Cornell's data systems.

estimates on a regular basis, preferring instead to negotiate with departments over space, using a set of space standards that the university had developed long ago. So, for example, as a full professor I am "entitled" to an office of a certain size and as a vice president to an office of another size. If departments have more space than the standards indicate they "deserve," the college business officers can then negotiate with the departments for reductions.

I took pride during my term as a central administrator that my office was 40 percent smaller than the space standards indicated that my position entitled me to have. One of my responsibilities was to supervise Cornell's office of space planning. Whenever people came to me complaining that they did not have enough space, I simply shrugged my shoulders and complained to them about my own allocation of space. I also never told the business officers that imposing fixed space to faculty ratios that do not change as either relative costs change, or as the budget constraint facing the university shifts, does not make a lot of sense from the perspective of an economist. Instead, I followed the dictum of the provost, who while a musicologist often thought more like an economist than I did, that if information is not going to be used, don't bother to incur the costs of collecting it. The marginal cost of developing space cost information for Cornell currently far exceed the marginal benefits the institution will get from collecting the information.

## **Concluding Remarks**

The examples I have discussed above are only a few of the many issues that confront university decisionmakers in which economic models and methods can usefully contribute to decisions. Some of the other issues that I confronted during my term as a Cornell vice president in which my skills as an economist were most relevant included endowment spending policies; choosing among alternative ways to air-condition a campus in the face of changing environmental regulations; using internal transfer pricing mechanisms to facilitate academic objectives; deciding how library resources should be allocated; designing financial aid policies to enhance student quality and diversity; studying the extent to which compensation policies are gender neutral; pricing parking; designing employee benefit programs; and using hedonic models to understand graduate program rankings and to help decide where to allocate resources. I will elaborate on my discussions above and discuss all of these other topics and much more in a forthcoming Harvard University Press book.

I loved the time I spent as a senior central administrator at Cornell. Although one might not sense it from the tone of some of my remarks above, I accomplished an enormous amount during my administrative term. For example, I helped to integrate the many economics departments across the campus and improved the quality of their senior faculty hires, helped to create a new university-wide department of statistics, worked with the faculty senate to create Cornell's first university-wide faculty tenure



review committee, helped to establish our response to the end of mandatory retirement, and helped to evaluate and redesign some of our financial aid policies.<sup>16</sup>

To paraphrase the words of James Freedman (1996, p. 20), the best part of my job was that I was able to raise very fundamental issues with my colleagues in the administration, on the faculty, and on Cornell's Board of Trustees and to force them to think about these issues. They did not always respond to these issues in the way that I personally would have preferred, but I had the satisfaction of knowing that the university was thinking seriously about the situation. I enjoyed trying to explain simple economic concepts to my faculty and administrative colleagues and to push them to think about these concepts when major issues were debated. This is perhaps the major and unique contribution that economists can make when they serve as senior central administrators.

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<sup>16</sup> Much of my success as an administrator derived from faculty members' perceptions that I was one of them and would eventually return to my faculty position. However, if faculty members believe an administrator's return is imminent, they will try to outlast the administrator. Hence, to maintain my effectiveness, I regularly had to claim that my expected term in office was longer than I actually planned. Even administrators with the utmost integrity must sometimes withhold information.

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