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Why Universities Need Institutional Researchers More Than They Realize?

Abstract
This paper discusses the benefits of universities maintaining and utilizing institutional researchers, citing specific examples of invaluable research conducted that proved instrumental in providing data and surveys for key papers and discussions by faculty at other institutions, as well as the importance in using offices of institutional research to guide decision-making at universities.

Keywords
higher education, institutional researchers, resource allocation

Comments

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Why Universities Need Institutional Researchers More Than They Realize?

by

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I. Introduction

I have been a devoted fan of university offices of institutional research for longer than I care to remember because data they collect has been the basis of much of my research and thus my professional reputation. I also had the great pleasure of serving as the vice president at Cornell University to whom the office of institutional research reported during part of the 1990s. Much to the surprise of our President and Provost, neither of whom was data driven, institutional researchers and I conducted two studies during my tenure that directly influenced decisions at Cornell and that also led to two published papers.

Since my return to the faculty in 1998 and my founding of the Cornell Higher Education Research Institute (CHERI), I have continued to use institutional researchers' data with vengeance and earlier this year published a paper that made use of data from one data exchange, that I agreed not to identify, on graduate assistant stipends and working conditions to address some issues relating to the collective bargaining for graduate assistants at public universities. Many institutional research offices have been kind enough to respond to the institutional surveys that CHERI undertakes each year, including our most recent survey requesting permission to access the information on faculty salaries by discipline that a set of universities annually report to the Oklahoma State University Faculty Salary Survey. So put simply, without offices of institutional research there would be no me (at least professionally) and I owe institutional researchers a great debt of gratitude.

This paper will provide a quick tour of some of the research that others and I have conducted using data sets collected by offices of institutional research to provide an

"outsiders" sense of how valuable the data collected is to researchers and in framing institutional policies. Given the upcoming assessment of graduate programs that will be undertaken by the National Research Council, I will spend most of the paper discussing research relating to graduate education.[1] I will conclude with a few comments on how the usefulness of institutional researchers to universities can be improved.

II. Optimal Financial Aid Policies for A Selective University

My first paper relating to the economics of higher education was published in 1984.[2] It presented a utility maximizing model that showed what information a selective college or university needed to determine the size of the financial aid package that it should optimally offer to different admitted undergraduate applicants. This paper, which provided the intellectual underpinnings for what is now known as "preferential packaging" required me to estimate model of admitted applicants' propensities to accept offers of admission – in particular to determine how sensitive different types of admitted applicants' acceptance decisions were to the financial aid packages they were offered. To estimate these models required me to merge together four different types of data:

1. Information on admitted applicants characteristics that was "owned" by Cornell's Office of Admissions
2. Information on admitted applicants' families financial situations and the financial aid offer that was made to each admitted applicant – these data were owned by Cornell's Undergraduate Financial Aid Office (remember admissions decisions are need blind at Ivy League universities)

[1] Jeremiah P. Ostriker and Charlotte V. Kuh (2003)
[2] Ronald G. Ehrenberg and Daniel S. Sherman (1984)

3. Information from an Admitted Student Questionnaire that had been conducted by Cornell's Office of Institutional Research (which had information on other institutions to which students were admitted, at which institution each admitted applicant was enrolling, and the financial aid package that these institutions offered applicants) and
4. Information on characteristics of the other college (SAT scores, distance of it from the applicant' home) obtained from published volumes and a geographic information system (inasmuch as this paper was written in the early 80s, the latter consisted of a map of the United States and a ruler).

While few people talked about the need for data warehouses in the early 1980s, note that the three Cornell databases that provided individual level data that were used in the study were "owned" by different offices of the university and a crosswalk had to be developed to merge the three data sets together. As will be come clear throughout the paper, although offices of institutional research do not need to "own" all of the data bases that universities maintain, they need to have access to many of them.

III. The AAU/AGS Project for Research on Doctoral Education

In 1988, the Association of American Universities (AAU) and the Association of Graduate Schools (AGS) initiated a *Project for Research on Doctoral Education.* Information was collected on all applicants to PhD programs in 10 fields at participating AAU institutions and longitudinal data sets created that included information on admissions and enrollment decisions, types of financial aid offered to students at each

institution at which they were accepted and, once a student was enrolled in the program, information on the student's progress through the program to dropout or degree.

Ultimately, the project was discontinued because of the difficulty participating institutions experienced in collecting longitudinal data on enrolled students on an ongoing basis. However, the usefulness of these data was enormous. Departments could learn exactly who their competitors for PhD students actually were. Perhaps, more important, the data could be used for research purposes that proved important for both individual institutions and our nation's system of graduate education.

Cornell University participated in the project and the information that Cornell's Graduate School reported to the AAU/AGS project on continuing graduate students' status and form of financial support each year had been collected (and archived in paper form) for decades by our Graduate School. After tediously converting these data to electronic form, a graduate student and I were able to use these data to estimate competing risk duration models of graduate students' propensities to drop out of their programs and their times-to-degree. In a paper published in 1995, we showed that after controlling for measures of student ability, students who received fellowship or research assistant support had much higher probabilities of completing their programs and slightly shorter times-to-degree than students who were supported primarily by teaching assistantships or who were self-supported.[3] This research supported efforts by the Cornell Graduate School to obtain more resources from the central administration for first year PhD fellowships.

One issue that our nation's research universities persistently must confront is the claim that our enrollment of foreign PhD students is displacing American students who

[3] Ronald G. Ehrenberg and Pangiotis Mavros (1995)

otherwise might gain admission to our PhD programs. Concern has been expressed, in particular, that foreign students are displacing underrepresented minority students and that this contributes to the continued under representation of minorities among the PhD population. In a wonderful paper published in 1997, Richard Attiyeh, long-time Graduate Dean at the University of California – San Diego, and his son (a PhD economist) used project data to debunk this claim.[4] They estimated models of the probability of students being admitted to PhD study at each institution. Holding constant measures of academic ability, they found that foreign students were "discriminated against" and that underrepresented minority students received preferential treatment in the PhD admissions process. While this study does not imply that American universities are doing enough to attract underrepresented minority PhD students, it did show that programs at AAU institutions were making efforts to increase the flow of minority PhDs.

IV. Does Federal Support for Graduate Student Displace Institutional Support

Much of the data that offices of institutional research compile is done for required reports to government agencies. What many people are not aware is that these institutional level data are often of great use to researchers conducting policy research.

For example, in a paper published in 1993, two graduate students and I used data from a number of IPEDs surveys to estimate the extent to which universities alter their internal allocation of funds to support graduate students in response to changes in external funding that the universities receive to support graduate students.[5] We found that increases in federal support for graduate students are associated with a decline (but less

[4] Gregory Attiyeh and Richard Attiyeh (1997)
[5] Ronald G. Ehrenberg, Daniel Rees and Dominic Brewer (1993)

than proportionate) in institutional support for graduate students, that the decline is greatest at the top research universities (which have a strong sense of the size they want their graduate programs to be) but that even here the decline is modest, and that when external support for graduate students increases in one field, institutions often divert a share of their internal funds for graduate students' support from that field to other fields. While some "diversion" of internal support to areas other than the ones that funders are supporting takes place, the magnitudes of this effect is not large and hence in the main the diversion is not an issue that policymakers need to worry about.

V. The 1995 NRC Ratings of Doctoral Programs

The 1995 NRC Ratings of Doctoral Programs was published while I was supervising Cornell's Office of Institutional Research[6] Unlike previous doctoral program ratings that had been undertaken, data was also presented in the published volume on objective measures of each program (faculty size, publications, citations, receipt of research grants etc.). While faculty raters of programs were not provided this information at the time they made their ratings, it dawned on me that we could act "as if" they knew this information and thus could estimate models of how their subjective ratings were related to objective measures of faculty size and productivity. We could then use these estimates to understand why the programs at Cornell that were not rated in the top 10 in the nation in their fields were not rated at that level.[7] Was it because they were too small –ratings are known to correlate with faculty size? Or was it because the faculty members in the

[6] Marvin L. Goldberger, Brendan A. Maher, and Pamela Ebert Flattau (1995)

[7] The methodology that we developed allows institutions to choose whatever comparison group they want for each department (e.g. top 10, or top 20, or top 50 – and the group chosen may vary across departments at an institution). For example, if an institution wants its programs in each field to be in the top ten percent of all programs in the nation, it would choose a larger comparison group for fields in which there were many programs nationwide and a smaller comparison group for programs in which there were only a few programs nationwide.

program were simply not as productive as their colleagues in top departments – as measured by things like publications per faculty member and citations per faculty member?

The methodology that Peter Hurst and I conducted on this subject was published in a paper in 1998 to illustrate to researchers at other institutions how they could similarly evaluate the reasons for their departments' failure to be ranked highly.[8] Without going into the details of the methodology, as I have described elsewhere, our approach had an impact on at least two graduate fields at Cornell.[9]

Our sociology department was one of the lowest ranked social science departments at the university and the dean of the College of Arts and Sciences was contemplating withdrawing support from it. However, our analyses suggested that faculty in the department were ever bit as productive as faculty at top 10 sociology departments in the nation and, as a result, the dean decided to increase, rather than decrease, funding of the department. Today it is a much-improved department, perhaps the best social science department at the university. In contrast, the size of our faculty was seen not to be the major cause of our relatively poor rankings in biology and, after the mandatory period in which faculty members blame the university administration for all the bad things that have happened to them, our biology faculty got together and constructively planned ways to improve what they were doing.

This research illustrates that institutional researchers should be opportunistic. They should take advantage of data that others collect to help guide decision-making at their universities.

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[8] Ronald G. Ehrenberg and Peter Hurst (1998)
[9] Ronald G. Ehrenberg (2002), chapter 4

VI. Confronting the End of Mandatory Retirement and Faculty Productivity in Supervising Graduate Students

During the time that I supervised it, the Office of Institutional Research was involved in a project that related to the end of mandatory retirement. Although the law ending mandatory retirement for tenured faculty members effective January 1. 1994 had been passed in 1987, Cornell, like many other institutions, had not seriously thought about what the end of the law would mean for it.

When we began our research in 1997, Cornell had two years of experience living with the end of mandatory retirement. Simply inspecting the data on faculty retirement patterns we found that the vast majority of Cornell faculty were continuing to retire in advance of age 70- this suggested to us that expensive buy out plans that paid faculty to retire prior to age 70 would be a very costly way to influence faculty retirement behavior. We also found, however, that a large share of those faculty members hitting age 70 were now staying on rather than retiring.

The Office had previously developed a faculty flow model - a Markov chain model of the flows of faculty into and out of different age groups each year- and we used this model to predict what the impact of changes in the retirement behavior of those faculty still employed at age 70 would be. We found that postponement of retirement, even by this relative small share of our faculty, would substantially reduce the rate of new faculty hires at the university and would also reduce the size of the salary pool that becomes available for continuing faculty salary increases, when departing senior faculty are replaced by lower paid junior faculty. This led to the appointment of a joint

faculty/administrative committee, which I chaired, that developed a set of proposed changes in Cornell's policies that were ultimately adopted by the institution.

Our study and the changes made in Cornell's policies are described in an article published in 2000.[10] One thing that we did not consider in that article was how changes in the age distribution of Cornell faculty would influence graduate education at the university. In a forthcoming paper, two undergraduate students of mine obtained data on the faculty members who supervised each Cornell PhD dissertation over a 7-year period from the Cornell Graduate School.[11] They found that even at a major research university, many faculty members had no graduate student supervisory responsibilities during the period and that the distribution of responsibilities was much more heavily concentrated among a relatively small number of faculty members in the social sciences than it was in the physical sciences.

From the faculty data base that is maintained by our Office of Institutional Research, they were give access to each faculty member's age, gender, field, rank, date of receipt of PhD and whether the faculty member came to the university directly with tenure. The students were able to merge the Graduate School data with the data on the characteristics of faculty members to estimate, among other things, how supervision of graduate students varies over faculty members' careers. On average, they found that the number of PhD students that a faculty member supervises tends to peak at about 20 years after he or she receives the PhD and that the number declines thereafter. Whether this pattern will be altered as the age distribution of our faculty changes is an open question, but it should

[10] Ronald G. Ehrenberg, Michael Matier and David Fontanella (2000)
[11] Peter M. Crosta and Iris J. Packman (forthcoming)

lead the university to worry about whether an aging faculty will have an adverse affect on graduate education.

VII. Collective Bargaining by Graduate Assistants

The first graduate student union to be recognized as a collective bargaining agent was at the University of Wisconsin in 1969. By 1999, teaching assistants at eighteen public Research and Doctoral Universities were covered by collective bargaining agreements and in some cases these agreements covered research assistants at the same campuses. Since the start of 1999, sixteen additional major research universities and doctoral universities have recognized graduate student bargaining agents, including all the campuses of the University of California and NYU, which in 2001 became the first private university at which collective bargaining for graduate assistants takes place.

Most universities that have been faced with graduate student unionization campaigns have vigorously opposed them, including many universities that have long had collective bargaining agreements with faculty or staff unions. The reasons for this opposition have included the belief that a system of shared governance is preferable to one of confrontation, the fear that graduate student unions might try to get involved in academic decisions that are more properly left to faculty and administration and the fear that graduate student unions will impose financial costs on universities that will force them to make cutbacks in other areas and/or to increase tuition by more than they otherwise would prefer to do.

Surprisingly, as of 2002, there had been no studies undertaken of the effects of graduate student unions on economic variables. Data from a data exchange conducted by a set of major universities however allowed me to conduct some preliminary analyses on

this question. Under the condition that I would not divulge the name of any individual institution participating in the exchange, or even the name of the data exchange, I was granted access to five years of data on the salaries, compensation, and costs of teaching and research assistants at a set of public universities.

In a paper that three undergraduate students and I coauthored, we grouped these universities into 3 groups.[12] The first consisted of 16 institutions that have never had a collective bargaining relationship with graduate assistants. The second group consisted of eight institutions that had collective bargaining agreements with their graduate assistants before 1995 and two more institutions that first began bargaining with graduate assistants in 1995 or 1996. The final group consists of 7 institutions that first began bargaining with their graduate assistants during the 1999 to 2001 period. For simplicity, I restrict my attention to teaching assistants in what follows, but the data for research assistants yielded very similar results.

In our paper, we presented tabulations of the mean values, across institutions in each group, of a number of economic variables for five academic years, 1996-1997 through 2000-2001. The variables we looked at were

1. average academic year teaching assistant stipend
2. average academic year stipend minus in-state tuition and fees that teaching assistants had to pay
3. average teaching assistant stipends for summer teaching
4. average stipends deflated by cost of living measures (either housing prices, or assistant professor salaries)

[12] Ronald G. Ehrenberg, Daniel B. Klaff, Adam T. Kezsbom and Matthew P. Nagowski (2004)

In each case we compared the changes in the mean values that occurred during the period for those institutions that were either organized before the start of the period, or became organized in 1995 or 1996, to the changes in the mean values for those institutions that were never organized, or that became organized at the end of the period. On balance, we found no evidence that becoming organized during the period, or being organized before the period began led to a greater growth in academic year stipends during the period. Whether this reflects the inability of graduate student unions to win large salary increases for their members, differences in the tightness of the state budgets between the states in which institutions in which graduate students were organized are located and the tightness of budgets in states in which institutions with graduate students that are not organized are located, or a concerted effort by nonunion schools to raise stipends to try to encourage graduate students not to think about organizing, could not be determined from our analyses.

We did find evidence, however, that graduate students who were at institutions in which bargaining was in place either at the start of the period, or began during the period, saw their required tuition payment go up by a smaller amount during the period, which suggests that graduate student union can influence tuition remission decisions. Similarly, we found evidence that summer teaching stipends for graduate students increased by more at the institutions in which bargaining was in place either at the start of the period or began during the period. However, the magnitude of each of these "effects" was small. Hence, although these results to not hold other factors that may influence theses outcomes, such as changes in state appropriations and changes in graduate tuition levels,

constant, they do suggest that graduate assistant unions have not had major impacts on the finances of public universities.

Other comparisons that we reported in the paper attempted to control for differences in the change in cost of living in different areas during the period. We did so in a number of ways, including simply looking at graduate assistant stipends relative to the average salaries of assistant professors at the institution. When we did this, we found little support for the proposition that graduate student unions increase the salaries of teaching assistants relative to the salaries of assistant professors. This finding should not be too surprising – several of the graduate student contracts specify that the salary increase that their members are to receive will be equal in percentage terms to the increases granted to the faculty.

Taken together our findings suggested that the impact of graduate assistant unions on economic outcomes has not been very large and that concern about the issue of graduate student unions may be overstated[13]. Indeed attracting and retaining top graduate students is an important objective of faculty at all research universities and so the faculty is often supportive of increased stipends for graduate fellows and assistants. Concern about graduate assistant unions, for the most part, is an administrative not a faculty concern.

The conditions governing my gaining access to these data limited the sophistication of the analyses that I could conduct with them. CHERI currently has a survey in the field asking graduate deans at public research and doctorate institutions to provide us with a longer historical data series on teaching assistant stipends, tuition

[13] An important concern of graduate students in many organizing efforts has been workload issues. Our analyses of the survey data found no evidence that graduate student unions had decreased their members' workloads relative to those of graduate assistants at institutions without unions.

remission policies and health insurance coverage (which was missing in the data to which I was granted access). These data will be merged with other publicly available institutional data sets and information on the date that collective bargaining coverage began, if ever, for graduate assistants at each institution. The merged data will then will be used by a doctoral student who is seeking to explain the historical pattern of the growth of collective bargaining coverage for graduate assistants and to analyze more precisely what the effects of collective bargaining coverage have been on graduate assistants' stipends, tuition remission policies and health insurance coverage.

VIII. Concluding Remarks

Space does not permit me to discuss a major evaluation CHERI is conducting for the Andrew W. Mellon Foundation on the effectiveness of their *Graduate Education Initiative*. This initiative provided over $80 million dollars of financial support to 50 humanities and associated social science programs at 10 AAU institutions over a decade to improve their doctoral programs. Data have been collected annually for students who entered either these programs or a set of control programs in the same fields at other institutions by the graduate schools at each university. Students have been followed each year until attrition or degree completion, with information being reported on their status each year and the types of financial support they were receiving. That these data have been collected suggest that the factors that caused the cancellation of the earlier AAU/AGS data exchange have been overcome (perhaps because the Mellon Foundation paid for the data collection efforts at universities in which no program was receiving program support from the Foundation).

I mention this evaluation because I suspect that many of the offices of institutional research at universities that have departments that are either "treatment" or "control" departments in the study are unaware of both the Mellon Program and the evaluation that we are undertaking. I make this conjecture because one of the problems that institutional researchers at some institutions face is that they are not aware of the existence of all of the different data bases that are being collected and maintained on their campus.

If we are serious about using offices of institutional research to improve decision-making at our universities, the development of a data warehouse at each institution that includes all of the institution's databases is absolutely essential. So too is educating administrators at these institutions about the usefulness of institutional research. At my institution, it is fair to say that institutional research has played an important role informing student affairs and admission and financial aid decisions (as evidenced by the first paper I talked to you about). However, with some exceptions (which I have mentioned above) it played a much less important role in informing other decisions at the university because our past president and the two provosts who served under him were not "data driven" people. I take it as a personal failure that when I was a Cornell Vice President supervising our Office of Institutional Research I did not spend enough time trying to educate other key administrators about the importance of institutional research

One best unnamed senior Cornell administrator often told me that a major challenge that he faced was "managing" the person to whom he reported. I suspect that this is a challenge that many of you face, how do you convey to the people for whom you work the importance of what you do if they are not "data driven" people themselves? Perhaps pointing out to them how institutional research at other institutions has informed

decisions is a useful strategy. Perhaps simply illustrating how existing cross-institutional databases have aided institutional decisions at one's own institution is another route to follow.

The forthcoming NRC Evaluation of Doctoral Programs in the Arts and Sciences, Engineering and Agricultural Sciences will provide important data that will influence doctoral programs in the years ahead. The methodology to be used in the upcoming review will be very different than that used in the 1990s study and the data collected by the NRC will be made widely available to researchers for research purposes. In addition departments will be required to collect new types of data, which many of them have foolishly not collected in the past (e.g. tracking the employment of all former PhD students). This is a very appropriate time for offices of institutional research to be focusing on issues relating to graduate education.

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