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ABSTRACT

Institutional costs need to be analyzed for several reasons: (1) to increase the income of the institution; (2) to improve decision-making at the margin; and (3) to maximize efficiency. The means of costs analysis involve a simple issue: which costs to include. This decision depends on the purpose of the analysis. The actual effects of the usual variations in costs analysis methodologies on results is slight; the acceptability of results, however, is greatly enhanced by the use of standard methods. A student of investment theory would conclude that higher education investment policies (that is, the regularly recurring decisions that result in costs) have not been rational; he would probably suggest that higher education covary costs with benefits in accordance with the results of cost studies. Doing so brings higher education face to face with the pricing issue, and the differences and similarities between this and other industries. Some careful reflection on tomorrow's policy issues may help in developing better methodologies today. (Author/MSE)

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WHY ANALYZE COSTS?

HOW ANALYZE COSTS?*

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Inasmuch as costs measure the use of resources, we, as good scientists, scholars, and citizens, analyze costs to determine the extent to which our enterprises fit under the Second Law of Thermodynamics in a universe winding toward entropy, right? Probably wrong!

We might be good scientists, scholars, and citizens but most of us weren't hired to do basic research and won't be retained very long unless we produce outcomes of immediate and practical value. The most practical reason for analyzing costs is to increase the income of our institution. The fact that our colleague Professor Bright is about to receive an NSF grant provides the opportunity. If we analyze our institutional costs by dividing them into two categories, direct and indirect, according to the procedures and definitions in U. S. Bureau of the Budget Circular A-21, we can increase the size of the NSF grant by from 5% to over 100%. Those extra, indirect, dollars can be invested in any of a number of worthy enterprises: including, perhaps, the continuation of the Office of Institutional Research.

On the basis of hearsay concerning the NSF grant, Professor Contrarious, moderator of the local association of university professors, tells the president of the governing board that "90% of the institution's budget goes into overhead." Dr. I. M. Willful (honorary doctorate, Aggressive Junior College, 1970; source of funds to match the federal grant to build the Aggressive Center for the Performing Arts, 1971; renowned educator and chairman of our governing board, 1972)

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suggests that the three most recently hired administrators be "non-retained:" meaning you, your secretary, and Dr. White, the grants coordinator, must leave. This provides the opportunity to demonstrate the second most important reason for analyzing costs: to improve decision making at the margin. Marginal cost analysis and the concomitant comparison of the benefits with the costs of having a grants coordinator should facilitate the decision to retain or non-retain him.

Closely related to marginal analysis are comprehensive unit--average and minimum--cost analyses. In marginal analysis we determine the costs and benefits of a marginal activity, i.e. something new, something of low priority, or, at least, something about which someone has serious doubts. In comprehensive cost analysis the total resources used in the institution are divided and subdivided in terms of one or more of the following:

Bases	Examples	Uses
1. Fund Category	Current operations, student loans, capital for physical facilities, agency funds.	Understanding the past, present, and future nature and cost of specified activities and objectives.
2. Source	Students, taxes, gifts, earnings.	Understanding where future funding may come from; making revenue estimates.
3. Functional Activity	Instruction, Research, Public Service, Libraries, Student Services.	Understanding the past, present, and future costs of performing the institution's functions.
4. Object of Expenditure	Faculty salaries, supplies and services, capital equipment, scholarships.	Understanding what expenditures buy--in an immediate sense.
5. Organizational Unit	College of Letters and Science, School of Business, Extension Division, Minority Institute, Computer Center.	Understanding where expenditure takes place in the institution.
6. Product or Outcome	Competencies, productive potential, knowledge.	Understanding the impact of higher education on people and society and the benefit-cost ratio of investments in higher education.
7. Time Period	Quarter, semester, term, session, year.	Understanding what resources will probably be required in future time periods.

Accountability is the watchword in such comprehensive analyses. Every dollar is accounted for in terms of the purpose which motivates the analysis. Comprehensive cost accounting becomes unit average cost analysis when the total cost in a category is divided by a unit such as a semester, student, credit, graduate, faculty member, major, etc.

The most important reason for analyzing costs is to maximize efficiency by finding and adopting the organization and processes which produce the outcomes of the institution at minimum cost. Although minimum costing can be done on a hypothetical basis, i.e. through modeling and simulation, full scale changes in organization and process are usually preceded by studies of existing alternates and by pilot testing. In other words, cost analysis in the search for minimum costs--and higher productivity--is part of a larger action research design. The resources conserved through systems, procedures, and process analysis are usually (a) dedicated to the production of alternate outcomes which will make the institution more effective, (b) invested in social enterprises which produce higher rates of return, or (c) returned to private persons through reduced taxes and lower tuition and fees.

The "how" of cost analysis involves a simple, common issue: which costs to include. Resolution of this common issue depends on the purpose of the analysis, the availability of data, and our ability to make acceptable estimates in the absence of data. Indeed, the purpose is clarified and crystalized as the inclusion decisions are made. To avoid bias, we make these decisions explicit, and in company with a respected second party. To avoid subversion of the purpose of the analysis, we make estimates where cost accounting data are inadequate, carefully avoiding the temptation to use only readily available data. As responsible administrators we, of course, improve the cost accounting system so that future analyses are better founded.

Formal higher education entails many costs which do not appear in institutional budgets and accounts. As Institutional Researchers we take institutional costs under consideration first, but eventually we'll be asked to comment on larger issues, in connection with which, we will need an understanding of costs in the economists' sense. Therefore, as we do cost analyses, we take note of items such as property, sales, and income tax exemptions; student earnings foregone; the contributions of members of religious orders; etc.

The comparison of planned and budgeted costs with actual costs is part of cost analyses which aim at improving the planning process. Such studies include comparisons of faculty assignments as detailed in the budget with faculty performance described in faculty effort reports. One of the very costly objects of expenditure in higher education is faculty time and effort, the other is student time and effort. The most promising proposals for increasing efficiency in higher education--credit by examination, the open university, larger classes, the three year degree, work study, etc.--touch on one or both of these costs. Neither can be ignored by responsible analysts.

How we analyze costs depends on why we analyze costs. Our purposes are often served through information exchange and interinstitutional comparison. The actual effects of the usual variations in cost analysis methodologies on results is slight. The acceptability of cost analysis results, however, is greatly enhanced by the use of standard methods. We, therefore, strongly recommend participation in the National Center for Higher Education Management Systems projects and the use of NCHEMS and NCHEMS-related products such as the Resource Requirements Prediction Model,* the Higher Education Finance Manual,* the Cost Finding Principles and Procedures* report, the various Data Element Dictionaries,* and John Ridge's How to Cost a University Program.**

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*Available from Mrs. Clara Roberts, P. O. Drawer P, Boulder, Colorado 80302.
**Available from the Office of Institutional Studies, The University of Wisconsin, Eau Claire, Wisconsin, 54701.

From the institutional perspective, we have identified some of the principal reasons for doing cost analyses and have briefly touched on some of the common methodological issues. Both lists could be much longer; indeed they are constricted only by the limits of human imagination and ingenuity. Rather than expanding these taxonomies, and rather than exploring cost analysis from the different perspectives of students, governing boards, and others, we will use the remaining time to describe three specific uses of cost data--allocating resources, evaluating instructional programs, and pricing higher education--then we will try to field your questions and comments.

Benefit-cost analyses of higher education indicate that both benefits and costs vary widely and somewhat independently. The competencies of graduating seniors with majors in history, for example, vary somewhat, from person to person and from institution to institution, but the costs vary a great deal more. The costs of each of the eight semesters vary somewhat, but the benefits of the semesters vary a great deal more. The outcomes of higher education in different types of institutions--large, public, church controlled, 2-year, old, stable, etc.--vary somewhat, but the costs vary a great deal more. The costs of different majors vary somewhat, but the benefits vary a great deal more. While both the costs and benefits for women are lower than those for men, the rate of return on investments in higher education for women is higher than for men. The social rate of return on investments in higher education for both men and women exceeds the private rate of return.

The most elementary student of investment theory would conclude that our investment policies, i.e. the regularly recurring decisions which result in costs, have not been very rational. He would probably suggest that we covary costs with benefits in accordance with the results of our cost studies, i.e. change our higher education investment pattern until all rates of return are equal to the current rate of return on commercial investments. Doing so brings us face to face with the pricing issue.

In the private sector, the difference between cost and price is profit, and while there is a lower limit, the limit above the break-even point is set by real and threatened competition in the market, government regulation, etc. Do institutions of higher education live under and follow analogous rules and policies? Should they? Dare they? Knowing that the costs and benefits vary, dare we charge the same tuition for semesters 1, 2, and 8? Knowing that the costs and benefits vary, dare we charge students of engineering and sociology the same tuition? Knowing that costs and benefits vary, dare we charge the academically advantaged and disadvantaged the same tuition? Knowing that the costs, if not the benefits, vary, dare we charge the same tuition at large and small institutions? In an increasingly mobile society dare we admit that knowledge embodied in students flows across state lines, that higher education is a good smokeless industry, that many residents move to other states after graduation, that many non-residents stay; dare we admit that the basis of the non-resident tuition increment is fading away? Finally, in light of the difference between social and private rates of return on investments, dare we propose lower tuition and increased tax support of higher education? As we do cost studies and other research, folkways and traditions come under a cloud; dare we use cost study data as the basis of changes in investment and pricing policies? Dare we act on the mounting evidence?

I am reminded of the letter which Galileo wrote to Kepler in which he referred to his calling on the professor of philosophy--which is to say, of theology--at Padua University. Galileo said he had asked the professor to look through the long, lensed tube--the newly invented telescope. The professor had said he could not do it. Galileo said: "You had better take an evening off. Come down and look through it. There is a new planet never before seen by mortal eyes."

"No," the professor said, "there is not such a planet."

"Well," replied Galileo, "come down and look."

"No," said the professor, "it is not there. I have read Aristotle carefully and I know the Bible backwards and forwards. The planet is not mentioned anywhere. I know it is not there."

"But I say come down and look at it, and see for yourself."

No, he was not going to do it because he was afraid that if he looked, he would see the planet, and he knew it was not there. The professor went on to say that if he looked and saw it, it wouldn't be real, but only an apparition--a temptation extemporized by the Devil to win him away from his faith.*

Today we live in a different age--or do we? We dare to look through the telescope, but dare we act on what we see?

Today, most of us in Institutional Research are refining our higher education cost analysis methodologies, and some of us are well into the design of follow-up studies and benefit analyses. Tomorrow we'll be looking at pricing and other policy issues. Some careful reflection on tomorrow's challenging issues may help us develop better methodologies today.

We invite your questions and comments.

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* From T. V. Smith, "Middlesized Values" in 1945 Twenty-Five Years 1970 (G. Kerry Smith, ed.) (San Francisco: Jossey-Bass, 1970, pages 29 and 30.)