The University's Entry Fee to Federal Research Programs

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Summary. The university pays for its benefits from a federally financed project with its own investments in the faculty scientist and not, as is often assumed, by its absorption of project costs that are not reimbursed by the government. An analysis of the exchange of resources between the university, the scientist, the discipline, and the government shows, however, that by absorbing costs the institution gains acceptance as a host for federal research. Funds for this ticket of admission are drawn away from several groups on the campus. In exploring whether there should be such an entry fee, the pragmatic response of the National Commission on Research is considered.

The long-standing dispute between the universities and the U.S. government over the reimbursement of the institutions' expenses associated with government-sponsored faculty research has focused on two issues: the extent to which the university should absorb several types of direct and indirect research costs (*1*) and the nature of the records that must be kept by university scientists and administrators as a basis for federal reimbursement.

I will discuss the first issue, which has become increasingly pressing as reimbursed indirect costs consume a growing proportion of the virtually level supply, in real terms, of federal funds for faculty research (*2*). The important related dispute over record-keeping remains offstage in this discussion.

In many instances, faculty researchers and federal officials have apparently been in agreement that the universities should absorb more of the indirect costs, thus enlarging the share of federal funds available for the direct costs of the research for which the funds were granted by Congress (*3, 4*). University absorption of a greater, although indeterminate, amount of project costs, both direct and indirect, has been regarded as fair payment for the benefits that faculty research brings to the campus, notably, the educational stimulus of the presence of working scientists and the enhanced academic standing that their professional recognition may gain for the institution.

University administrators have countered that, whereas the absorption of some indirect costs required under the major regulations [see Office of Management and Budget (OMB) Circular A-21 (*5*)] may appear to be reasonable for a single project, the aggregate university contribution to all federally sponsored projects on a campus has become so great as, in many instances, to damage the institution's ability to meet its other academic responsibilities (*6*).

The Questions

In an effort, as a bystander, to cast a somewhat different light on this debate, I have sought to answer a series of related questions. The first is: What does the university receive in return for making up the difference between the total required for faculty research and the lesser amount provided by the federal sponsor? To examine the university-government relationship I analyze the interactions of the two at the level of their pattern of exchanges with the scientist and his or her discipline in the course of a given federal research agreement. It should become evident, from this analysis, that the university receives the benefits of faculty research in return for its own investment in the faculty scientist and not, as is commonly assumed, from its cost-sharing interchange with the government.

At the same time, distinguishing between the university's relationship with the government and that with the other participants does provide an answer to the question posed—namely, that cost absorption, or cosponsorship of the research, gains for the institution the critical asset of government acceptance as a host for sponsored faculty research. This acceptance is a ticket of admission to the group of universities with which the federal government will do research business. The sponsor agencies and federal grantees then benefit from the federal funds freed by cost absorption.

Consideration of the second question—Who pays for the ticket?—leads to identification of some of the groups in the academic community who lose out because of cost absorption. Attention then moves to the third question: Should there be an admission fee? Clearly, the answer depends on who is responding, but the analysis of the pattern of exchange points to a reply in the negative. Given the hard fact that the requirement of cost absorption is not likely to be abandoned by the federal sponsor, the pragmatic approach of the National Commission on Research is considered and cited as a useful framework for debate and decision on the subject.

My discussion of the pattern of exchange centers on only one type of federally supported research agreement at the university—the basic research project in which the faculty investigator's knowledge goals are formulated primarily in interaction with his or her peers in an academic discipline or specialty. The respective characteristics and actions of the four core participants—scientist, university, discipline, and agency sponsor—are summarized rather conventionally, as they play out in a successful project where matters work out pretty much as expected. No attempt is made to typify any particular discipline, and in the interest of brevity, the roles of graduate students and other senior investigators are omitted from the analysis. For the same reason, the several federal elements—Congress, OMB, and the various agencies that support a project—will be represented, as a composite, by one agency sponsor.

It should be underscored that somewhat different analysis would be required for each of the more complex federal contractual arrangements supporting university institutes, research centers, specialized facilities, or other research configurations. Each involves a somewhat different cluster of participants, objectives, and rewards. Still, the

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general questions raised concerning the university's contributions and gains are relevant to all of these.

University and Government in the Pattern of Exchange

Identifying the larger pattern of events and the interactive roles of the scientist, discipline, the university, and government in the federally sponsored faculty project makes it possible to clarify both the process by which the university gains its benefits from faculty research and the way in which cost absorption develops (*7*). The sequence begins in the period before a grant is won when the faculty scientist, the principal actor, sufficiently solidifies university-supported exploratory research on a specific problem to embody the idea in a formal request for funding to the appropriate federal agency.

A more formal grant phase opens after the agency staff and its advisers draw on the positive judgment of the scientist's peers, in a competitive review of proposals, and decide to fund the project. With the employer university acting as host to the grant, the scientist proceeds with the research, applying his or her own personal resources of skill and knowledge and organizing personnel and institutional and material resources provided through federal financing, university support and management, and discipline interaction.

A critical point is reached with the achievement of a substantive result that the scientist considers significant and that is communicated by a preliminary paper to a major journal, where favorable judgment of the finding by peer referees results in publication of the paper before similar announcements by colleagues working elsewhere on closely related problems. The federal grant terminates and the scientist moves into a tapering-off period, supported by the university, during which results are rechecked and amplified, a more complete report is written, and follow-up research is considered.

In this sequence, the university and each of the other participants in the pattern of exchange play one or more distinct roles and contribute directly or indirectly to the central objective of accomplishing the scientist's project. Without impeding the others, each receives compensating benefits that strengthen its position in competing for support in the future. Each, moreover, behaves accountably toward the others in the sense of using the resources it has received in the manner customarily accepted or specifically prescribed for these transfers (*8*). The financial relationships between the government sponsor and the university involve the only significant zero-sum elements in this varying-sum situation.

The various relationships and roles of the parties in the pattern can be briefly summarized. The federal agency receives an opportunity for a possibly successful investment in the pursuit of new knowledge when the scientist submits a proposal. The Congress has entrusted the agency with selecting such investments to achieve the national objective of promoting basic research that promises to expand knowledge in this and other disciplines, for the benefit of U.S. culture and the economy (*9*). Federal pursuit of this goal rests heavily (although by no means exclusively) on direct support of faculty proposals, on a competitive basis, within the scope of established research programs. U.S. policy-makers have concluded over the years that the discipline-oriented scientist, thus supported and interacting with colleagues and advanced students in the traditionally open university environment, is a highly productive source of the fundamental knowledge sought for the country (*10*). [In other western countries (*11*), central government funds reach faculty research primarily through each university's own internal distribution procedures.]

Over time, the agency's success in advancing the nation's knowledge goals is reflected in the scientist's peers' judgment of the quality of the work of its grantees. The agency expects that, in the annual interagency competition for budget shares, reports of worthy scientific achievements in the projects it has chosen will demonstrate that it is carrying out its mandate properly and merits sustained or increased financing.

The scientist hopes that the research results will meet his or her and the discipline's knowledge goals and favorably impress the sponsor agency. The researcher anticipates that professional recognition from this work will provide the basis for obtaining future sponsorship. These tributes and support, together with fulfillment of teaching, training, and other university obligations, will strengthen the scientist's position in competing with other faculty members for improved terms of employment at the university—or in negotiating for better terms elsewhere.

The discipline community, which provides peer judgment to the agency, expects to assess the value of the research results at a later stage and use and transmit the findings to others. This community expects that, in time, the demonstrated research capability of member scientists (situated primarily at universities) and the usefulness of its specialized knowledge will gain the discipline the support of the advisers and decision-makers who control academic funding and planning. From this could come increased funds for research, fellowships, and university posts in the specialty.

The university plays three roles in the research arrangement—employer, host, and cosponsor. Each has a somewhat different time span and involves a somewhat different contribution and return. As employer, the institution has a continuing contractual relationship with the faculty researcher for as long as the latter is in residence. This agreement includes a formal commitment on matters such as academic rank, salary, and teaching load (that is, time freed for

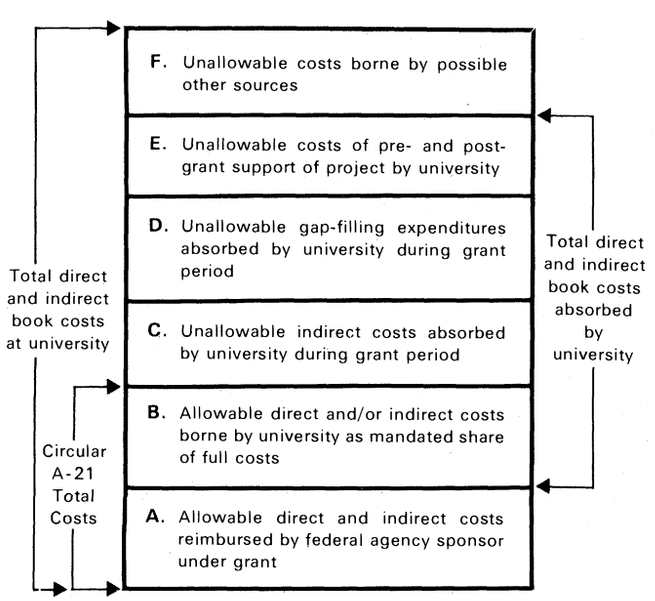

Fig. 1. Reimbursed and unreimbursed components of the total book costs of a project at an institution, in terms of attributable costs, direct and indirect, allowable and unallowable, as they can be found in or estimated from the university's books. Block A represents the direct and indirect costs for which the university is reimbursed. Blocks B through E are the costs it absorbs. Block F is included only for completeness. [From (*6*), courtesy of *Research Policy*]

research), and understandings on access to specialized laboratory, computer, or other facilities. The scientist, in return, contracts to teach, to provide research guidance and training to graduate students, and to let the stimulus of his or her working presence be felt in the department. A further exchange results from the university's granting of the asset of tenure—the right to a future flow of salary—in return for the scientist's commitments to the research that may gain recognition from the discipline and the support of outside sponsors.

In employing a faculty member competent in research, the university administration hopes that, over time, the scientist's educational impact and discipline recognition will increase its educational and scientific productivity and enhance its academic reputation. Such additional strength could improve the institution's chances in its continuing competition with other educational institutions (and other state government units, in the case of state universities) for financing from legislatures, philanthropic foundations, alumni, and other public and private sources. For clearly, the university's legal nonprofit status does not exempt it from the obligation to remain financially solvent. (Inevitably, there are serious elements of risk here. The scientist may leave for another institution, taking federal support along, before the university has had a chance to benefit from its investment.)

As a signatory, the university assumes the role of host for the duration of the grant. In this capacity, it gives the agency access to its particular teaching and research environment and takes responsibility for grant management, including financial accountability and compliance with pertinent regulations on matters such as safety, equal employment opportunities, and ethics. As the project progresses, the university is reimbursed by the agency for "allowable" direct costs, within the limits of the project budget, and "allowable allocable" indirect costs along lines separately negotiated with the government (*12*). In this role, the institution resembles any other specialized facility that is host, on a reimbursable basis, to an outside-sponsored activity that benefits from its distinctive ambiance and expert staff and services. (The actual items of technician services, materials, and the like, for which costs are reimbursed to the university, can be seen as flowing to the scientist from the agency sponsor through the institution.)

The university's cosponsor role is for the duration of the particular project and involves solely the institution's payment of costs not reimbursed by the federal sponsor. These expenses arise at various points in the course of the project (Fig. 1). Under OMB Circular A-21, direct and indirect project costs incurred outside the grant period are unallowable, as are the direct costs of gap-filling items used during the grant period but beyond the grant budget. The university also absorbs a specific congressionally mandated share of allowable project costs, in compliance with separate regulations on "cost sharing" in federal research (*13*). It further absorbs the project's share of several types of indirect costs that university business officers contend are assignable to sponsored research but that are unallowable or unallocable for reimbursement under the regulations (*14*).

Cosponsorship does not involve an exchange with the scientist or rest on any specific management functions. The role consists solely of the implicit transfer of funds from the university to the federal sponsor. (The real project inputs thus financed are direct transfers to the scientist from the institution.) Without this important university contribution or subsidy, the government agency could not obtain the research product it is charged with sponsoring. And the university's compliance with cost absorption regulations, over the years, assures its continuing acceptance as a host manager and a suitable site for faculty projects. University cosponsorship, here depicted as obligatory or unavoidable, is distinct from the institution's voluntary support of other faculty research activities with its own general funds through its own internal selection mechanisms.

The full set of contributions and benefits flowing among the four core participants in the pattern is diagrammed in Fig. 2.

Possible Benefits to the University

Some of the compensations often cited to uphold university absorption of project costs can be considered in the light of the various interactions among the four participants that have been identified. One presidential advisory committee, for example, suggested some years ago that "a university may gain a great deal from having the research in question done on its campus, with the participation of its faculty and students, and may be able and willing to share in the costs, either through its regular funds or through raising additional funds from foundations, alumni, or by other means" (*15*). The university, especially in the early 1960's, was seen as gaining certain assets from the presence of government-supported projects, for which it should reimburse the government. The benefits implied were the enhancement of graduate and undergraduate teaching. The returns to the institution, as already noted, contribute decisively to its educational goals. But they result, as we have seen, from the university's investments, as an employer, in maintaining the faculty scientist. The government plays no part in these exchanges and, in principle, can claim no compensation for them by requiring the university to absorb costs.

The related benefit of improved relative academic standing and competitive strength also accrues to the university from its employer role, rather than from cosponsorship. This return results from the roundabout or three-cornered exchange that begins with the institution's investment in the scientist as a faculty member, moves to the exchange that rewards the scientist with favorable discipline judgment and prestige in the discipline, and concludes with the discipline's recognition of the university as a center of high scholarly competence, in acknowledgment of the institution's investment in one of its productive members.

An incidental benefit of a scientist's project might be the incorporation of his findings into the teaching at the university. Although the host institution might have a head start in this respect, the findings are available to all universities through publication. In principle, then, the government sponsor cannot or should not require any one institution to pay for this public good of knowledge bought on behalf of the entire community.

It is sometimes said that federal funding of the scientist's work is a form of "assistance" or partial gift to the university (*16*) and that the institution should be prepared to pay part of the total costs. If a "gift" is defined as (to paraphrase Webster) a voluntary transfer of property from one party to another without a reciprocal transfer of something valuable, then the pattern of exchange portrayed above shows no such government gift to the university.

Another rationale advanced for cost absorption is that, by such absorption, the universities are underwriting an activity they should or would, in any case, support. For example, a representative of the Bureau of the Budget, OMB's predecessor, explained some years ago that "it has been traditional for universities to permit their senior faculty members to engage in research for a significant portion of their working time and some contribution of this sort should continue to be expected" (*17*). This

statement refers to the university's traditional voluntary support of faculty research through instruction budgets and institutional funds that are separately allocated to projects judged worthy by its own officers and faculty committees. In absorbing federal project costs, however, the insitutuion has no choice—it must add its money to the federal grant. Fewer discretionary funds are then available for independent research and other essential activities that do not command outside support.

The University's Ticket of Admission: Who Benefits?

The contributions of the university cosponsor to federally supported projects have been described in the context of the larger cluster of exchanges supporting faculty research. A review of some suggested benefits and associated obligations has shown that the university's gains from the faculty project are not obtained by cost absorption but are received, either directly or indirectly, in exchanges with the scientist and discipline. Yet the institution does gain from cost absorption the indispensable benefit of acceptance as federal research project manager. Therein lies the answer to the question posed earlier. The university is obliged to financially cosponsor a public good as an entrance or admission fee into the group of educational institutions with which the government will transact research support business. (No two institutions pay the same fee because of differences in management procedures and in the volume and types of federally sponsored research from one campus to another. But the same regulations govern all.)

To suggest that OMB Circular A-21 exacts an implicit entrance fee from the university is not to advocate the charge but simply to recognize its existence. The idea invites further examination. How did the admission fee come about when the universities argue that it is burdensome? Who else benefits?

As noted, it has been traditional for universities to support faculty research with their own general funds and the help of outside sponsors. The qualifying fee, in the sense of a compulsory or unavoidable university allocation to sponsored federal research, developed during the 1950's and 1960's when the institutions found themselves gradually caught up in the waves of a growing national economy, an expanding demand for graduate education, and a great increase in federally supported academic research following the fruitful university-government collaboration of World War II (*18*). Any institution aspiring to the then emerging model of the research university had to sustain its eligibility as a federal project host by accepting a degree of cosponsorship in each of a rising number of faculty projects. Only in so doing could it attract and retain an experienced faculty, capable both of research and graduate instruction. As one former university president has said, "The presence of [federally] sponsored research on a university campus . . . created the research university" (*19*).

In the current state of tightly limited federal resources for academic science and constrained support for higher education from all traditional sources, the university wishing to maintain a dynamic, research-oriented faculty still absorbs costs in order to be accepted as a host institution. It must continue to demonstrate its research and educational competence in the inter-university competition for outside financial support and for promising students.

Whereas there is some irony in the university's ambiguous situation as a beneficiary from compulsory cost absorption, the federal sponsor and the faculty scientist are clearly direct beneficiaries. The gatekeeper agency with a fixed research appropriation saves money, to the extent of the admission fee. The agency is then able to sponsor additional faculty projects to advance its research programs. And unquestionably, the major beneficiaries are those faculty members who can progress further in their work, with this support.

Who Pays for the Ticket?

In distributing limited discretionary funds, the university must make choices among many more competing internal claims than it can satisfy. Some activities must be cut to pay the admission fee. Someone's foregone activities are the opportunity costs of cost absorption.

The money, as earlier implied, may well be diverted from uses of direct or indirect benefit to faculty whose research, although judged worthy by institutional review procedures, is not likely to be aided by federal or other outside sources. They may be scientists who cannot take their next research steps unless a particular university laboratory is significantly upgraded, promising postdoctoral researchers on their initial independent research, or established scientists turning to some new lines of research considered rather risky for outside sponsorship (*4*, pp. 227 and 234; *18*, p. 31; *20*). Other members of the university, not in research, may also be deterred from activities that are similarly dependent on the institution's discretionary funds. These individuals and groups may thus be the actual donors of the money for the ticket of admission. They are likely to be the real losers in the roundabout regulatory and accounting process that generates the fee for university continuance as a host to possible federal research support.

Should There Be an Admission Fee?

Replies to the question whether the university should pay an admission fee have, as noted at the outset, varied over the years. Those faculty members and federal legislators who have seen either themselves or the research programs they favor as profiting from cost absorption have replied in the affirmative. Asserting that the current reimbursement rules provide a "backdoor subsidy" to the university that "siphons off" limited federal research funds, this group has called for changes that would further reduce reimbursement of indirect costs (*3*).

Replying to the question in the negative, university spokesmen have taken the position that since faculty research is "deemed by the [sponsoring] agency to be important to the Government or to the Nation" the government should pay the full costs (*21*). One university president has gone so far as to suggest consideration of the radical step of moving to a commercial cost-accounting basis for sponsored federal research since this, at a minimum, would provide full reimbursement and, possibly, some needed additional funds for independent faculty research [*20*, p. 12 (letter)].

A negative reply is also implied in the earlier analysis of the roles of the university as employer and host institution in the pattern of exchange. As an organization, the university invests in the faculty and other staff, the specialized facilities, and management competence that sustain its educational, research, and service functions. In the process, it becomes an "attractive . . . site for research . . . the total environment . . . within which scholarly work can be done." This continuing investment, not without uncertainties and risks, can be seen as the institution's "automatic contribution" to any sponsored research, regardless of the financier (*21*, pp. 82–83). No further compulsory contribution should, in principle, be required.

A Pragmatic Approach

Yet the hard fact of the matter is that the federal government is the sovereign power in the university-government research relationship and, like any other revenue-seeking sovereign, it does not readily abandon a going source of income, or, as in the case of university cost absorption, an established means of spreading its outlays for a desired public purpose. A somewhat fatalistic view along these lines has been expressed by the professional organization of university business officers in considering government-university contractual relations. They have emphasized the government's sovereign power to make any decisions deemed necessary for the "stewardship of public funds" and reminded their constituency that the federal research grant or contract "is not a [freely bargained] contract but a certificate of entry into a predetermined matrix of rights and duties within which a task is to be accomplished" (*22*).

Under the circumstances, it may be useful to look to the National Commission on Research for a more pragmatic way of dealing with the question of the admission fee. Drawn from academia, industry, and public life and chartered in 1978 as an independent advisory body, this commission considered the problems of accountability, record-keeping, funding mechanisms, peer review, and

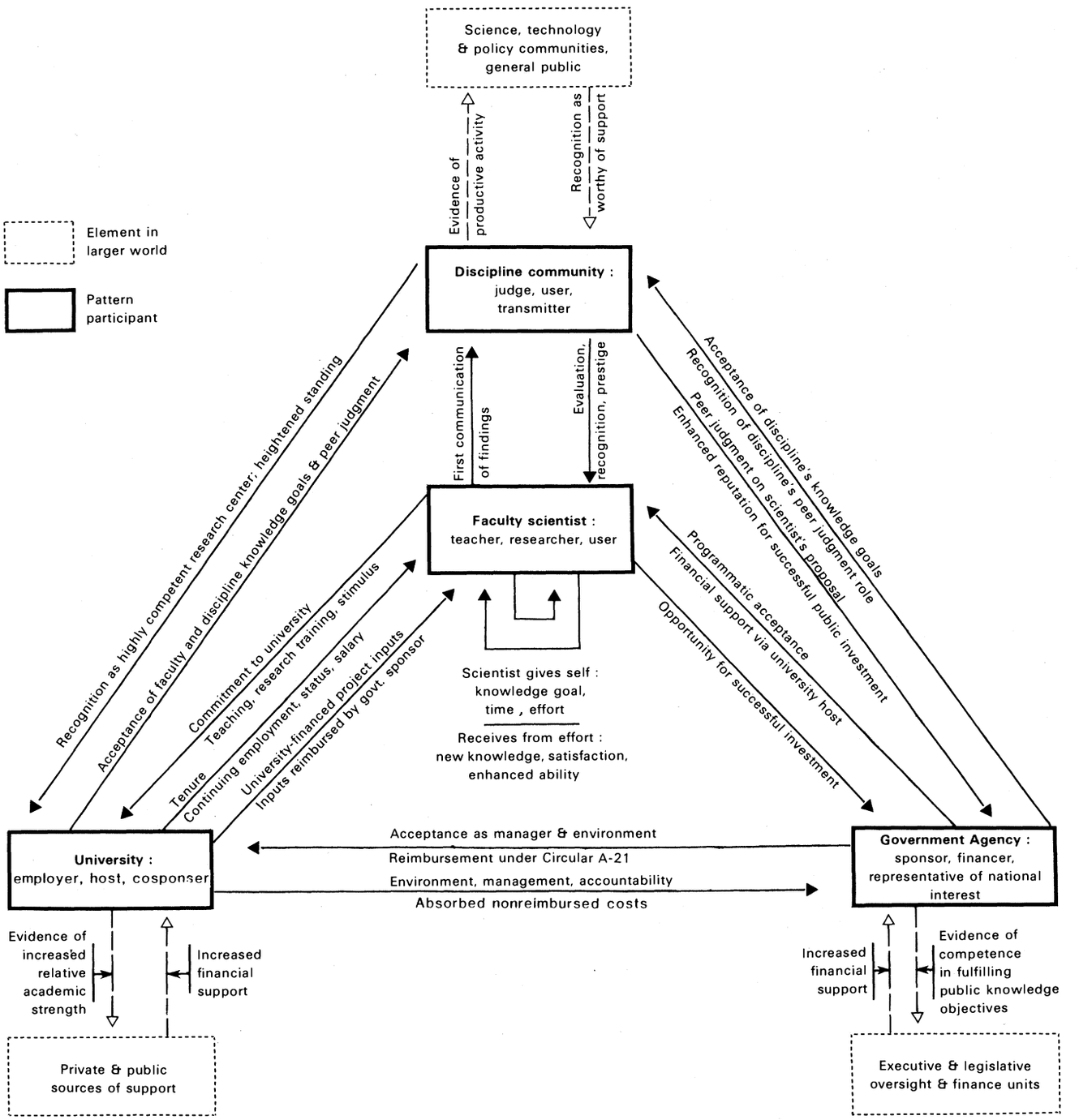

Fig. 2. Pattern of major exchanges in a discipline-oriented, university-based project receiving federal financing. Solid-bordered boxes represent each of the four core participants and their functions in the pattern. Resources transferred between participants are indicated by arrows. Broken-line boxes and arrows suggest each institutional participant's exchange with its critical source of support. [From (*6*), courtesy of *Research Policy*]

other issues underlying the increasingly "strained" relations between the university, faculty scientist, and government agencies in federally sponsored research (*23*). It presented a series of wide-ranging recommendations in 1980 on ways of overcoming these difficulties and of achieving a more effective use of existing federal funds for university research.

At a number of points the group considered the effects on the universities of OMB Circular A-21 and other regulations leading to cost absorption as defined in this paper. It felt bound to recognize that, whether or not there were statutory requirements on the subject, the universities and the government would continue to share the costs of basic research in many ways (*18*, p. 35). More specifically, the burden of its conclusions and recommendations was that cost absorption should be somewhat less than it had been, that its nature should be more clearly understood by those concerned, and that efforts should be made to overcome the internal university losses involved. A few examples of pertinent commission recommendations can be cited:

1) OMB Circular A-21 be revised to permit routine reimbursement (as an indirect cost) of interest charges incurred by the universities in financing the upgrading of research equipment (*18*, p. 29; *24*).

2) The specific statutory requirement of "cost sharing" in federally sponsored university research be repealed (*18*, p. 35).

3) Congress, the agencies, and universities reexamine other explicit requirements for "cost sharing" and matching of funds by universities in federal R & D programs "to make sure that only constructive and necessary requirements are imposed" (*18*, p. 35).

4) Universities make concerted efforts to reduce internal friction and misunderstanding about indirect costs through education and full discussion of issues (*18*, p. 34).

5) The government research agencies divert some funds from their current university research agreements to support, together with specific allocations of university funds, measures to overcome the growing obsolescence of university research equipment and to fill other "substantial voids" in the university's own continuing capacity to support faculty research, particularly "new initiatives" (*18*, pp. 29 and 31–32).

Many other commission proposals would have mitigated the effects of cost absorption by lightening other pressures on the parties concerned. All the group's proposals involving financing assumed an unaltered level of federal funding and hence implied some redistribution of existing flows of funds. Throughout, the commission advocated open discussion of issues by all parties concerned and accepted that solutions to many problems would require changes in viewpoint, in informal practice, in established procedures, and in regulations and law.

Concluding Remarks

In this article I have described how the university gains and retains its status as host to federally sponsored faculty research by absorbing certain costs of this research in the course of its exchanges with the government agency, the faculty scientist, and the cognizant discipline. Several groups within the university have been identified as the likely sources of the funds required for the institution's ticket of admission as host; they are the unwitting losers of the resources needed for their own research or other activities.

In exploring some answers to the question, whether there should be an admission fee, a range of views and the middle-of-the-road position of the National Commission on Research have been offered. It cannot be said that the commission's analyses have narrowed the gap in viewpoint between those who would increase cost absorption and those who would radically reduce or do away with it. But the advisory group's problem-by-problem approach and recommendations suggest an orderly framework for possible decisions in the continuing debate on this and related issues between the universities, faculty grantees, and the federal sponsor.

References and Notes

1. Direct costs are readily identifiable with a project—salaries and materials are examples. Indirect costs are for activities such as general administration, operation of plant and equipment, or other university activities that are not specifically identifiable with any particular project.
2. Indirect costs such as utility charges, security operations, maintenance, and compliance with federal regulations have been rising faster than salaries and wages, the major components of university direct research costs [R. L. Sproull, in *1978 National Science Foundation Authorization, Hearings on H.R. 3607*, U.S., Congress, House, Committee on Science and Technology, subcommittee on science, research and technology, 95th Cong., 1st sess., 1977, p. 1086.
3. R. H. Michel, letter to OMB director J. T. Lynn, 7 October 1976, p. 1; U.S. Congress, House, *Congressional Record*, 94th Cong., 1st Sess., 10 August 1976, p. II 8623; H. Zirin, *Phys. Today* **32**, 13 (June 1979); K. T. Brown, *Science* **212**, 411 (1981).
4. C. V. Kidd, in *The State of Academic Science: The Universities in the Nation's Research Effort*, B. L. R. Smith and J. J. Karlesky, Eds. (Change Magazine Press, New Rochelle, N.Y., 1977), pp. 201–204.
5. Office of Management and Budget, "Principles for determining costs applicable to grants, contracts, and other agreements with educational institutions," Circular A-21, revised, *Fed. Regist.* **44**, 12368 (March 1979).
6. D. H. Douglass, *Phys. Today* **33**, 104 (January 1980). One federal agency estimated that, under its funding, the university is reimbursed for only 30 percent of each indirect cost dollar it spends on a project, with the remaining 70 percent coming "from its own funds or other sources" [Department of Health, Education, and Welfare, Department Staff reply to the House Committee on Appropriations, overhead reimbursement to grantees and contractors" (Washington, D.C., 22 May 1975), part 1, p. 6].
7. K. S. Arnow [*Res. Policy* **10**, 46 (1981)] gives a more detailed analysis of the pattern and its implications for university accountability.
8. Some sociological and economic aspects of transfers and exchanges are explored by A. Kuhn [*The Study of Society: A Unified Approach* (Irwin, Homewood, Ill., 1963), parts 5, 6, 8, 9, and 10] and by P. Blau [*Exchange and Power in Social Life* (Wiley, New York, 1964), chapters 1–6]. Neither author considers a many-sided varying-sum pattern of exchange such as the pattern of research relationships.
9. National Science Foundation, *Guide to Programs, Fiscal Year 1979* (NSF 78-45, Washington, D.C., 1978), p. v.
10. S. Mac Lane, *Science* **210**, 158 (1980); D. K. Price, *The Scientific Estate* (Harvard Univ. Press, Cambridge, Mass., 1965), pp. 176–182.
11. G. Caty, in *The Research System* (Organization for Economic Co-operation and Development, Paris, 1972), vol. 1, pp. 69–79; in *The Research System* (Organization for Economic Co-operation and Development, Paris, 1973), vol. 2, pp. 65–73.
12. Allowable costs are generally those that can be charged to sponsored federal research. They must be "reasonable," not for items or other university purposes specifically excluded by the rules, and be clearly allocable or assignable to the particular grant (*5*, section C.1.-4).
13. Office of Federal Management Policy, "Cost sharing on federal research," Federal Management Circular FMC 73-3 (General Services Administration, Washington, D.C., 4 December 1973).
14. Examples are library services to graduate assistants on federal projects and development activities to raise money from nonfederal sources [*20*, pp. 4 and 10 (letter) and 3 and 4 (enclosure)].
15. Interagency Committee, "Report to the President on government contracting for research and development" (Executive Office of the President, Washington, D.C., 1962), p. 39.
16. L. D. Schaeffer, "HEW comments on proposed revision to OMB Circular A-21," letter to J. J. Lordan at OMB, 28 July 1978, p. 16.
17. U.S. Congress, House, Committee on Science and Astronautics, *Government and Science Hearings*, 88th Cong., 2nd sess., 1964, p. 315.
18. National Commission on Research, *Funding Mechanisms: Balancing Objectives and Resources in University Research* (Washington, D.C., 1980), pp. 2, 8, and 31.
19. J. D. Millett, *Manage. Forum* **1**, 4 (1972), supplement.
20. J. B. Wiesner, letter with enclosure to OMB director J. T. McIntyre, 12 June 1978, p. 10 (letter).
21. L. S. DuBridge, in *Federal Support of Project Grants: Indirect Costs and Cost Sharing, Hearings* U.S. Congress, Senate, Committee on Government Operations, subcommittee on government research, 91st Cong., 1st sess., 1969, pp. 77–78 and 96.
22. R. Scurlock, *Government Contracts and Grants for Research: A Guide for Colleges and Universities* (National Association of College and University Business Officers, Washington, D.C., 1976), pp. 17–18.
23. The 13-member commission was founded by several national organizations of learned societies and of universities. Over three-fourths of its funding was provided by five nonprofit foundations and approximately one-fourth by government sources. Its members served as individuals.
24. A 3 August 1982 revision of Circular A-21 makes allowable interest costs associated with the acquisition or fabrication of capital equipment completed on or after 1 July 1982, used in support of sponsored agreements, and casting $10,000 or more, if agreed to by the government [*Fed. Regist.* **47**, 33660 (1982)].

25. I appreciate the comments of P. W. Hemily, C. V. Kidd, and an anonymous referee. F. D. Pentecost provided valuable assistance.