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ABSTRACT

This presentation is intended to provide the reader with a perspective on indirect costs in sponsored research and an indication of the type of flexibility available within the provisions of Circular A-21, a document of the Office of Management and Budget that outlines procedures for determining university indirect costs under federal grants and contracts. The first evaluation to be made is the annual operating expense of those activities supporting the primary activities of the university. For organizational purposes, support expenses are grouped into functionally related cost centers such as fringe benefits, equipment use charges, building use charges, operation and maintenance, library, departmental administration, instruction administration, research administration, general and administrative, and student services. If an institution is to survive fiscally, the organized research component must contribute its fair share to those university expenses that are of an indirect nature. And if the institution is to retain a capable research faculty, the faculty must be informed and willing to support that recovery. (Author/HS)

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"Each program component should bear its fair share of total university expense."

PREPARING THE INDIRECT COSTS CASE FOR FEDERAL GRANTS AND CONTRACTS

By James C. Gilfert

PROCEDURES FOR determining university indirect costs under federal grants and contracts are outlined in Circular A-21 of the Office of Management and Budget. A study[1] of indirect cost recovery under federal grants and contracts clearly demonstrates that the university is the loser vis-a-vis private research organizations, whose cost recovery procedures are not limited by provisions of Circular A-21. Essentially, A-21 treats sponsored research as a by-product, rather than a major, activity of the university. This loss is a *real dollar loss*, and represents a diversion of state, endowment, tuition, or other funds away from their intended application to support federal research on the campus.

The argument is sometimes heard that federal support is merely funding the university in what it would be doing anyway, and that universities should thus be grateful for any support received. This argument may have held some validity twenty years ago, when regulations affecting reporting and accounting were much simpler, at a university where federal funds came from one or two agencies and represented a few percent of total university dollar flow. It is certainly invalid nowadays at institutions where funds from dozens of federal agencies and offices total many millions of dollars each year and constitute a major portion of the total dollar flow. In such cases, present regulations tend to punish the university for engaging in research activities which in many cases were solicited by the federal sponsors.

The present widely-recognized financial crisis in both public and private higher education accentuates greatly the burden of those non-instructional expense categories which were more readily borne in more affluent times. Credible forecasts of levelling enrollments and increasing public resistance to rising costs of higher education indicate that the crisis will not be a brief one. It becomes ever more important that sponsored research bear its fair share of expenses.

How then does one reconcile this dilemma? Although it is improbable that full cost recovery will be realized in any particular situation, institutional self-studies on several campuses have revealed areas in which weighting factors may be legitimately applied to certain allocable institutional expenses so as to maximize indirect cost recovery within the provisions of Circular A-21. A compilation of such weighting factors by institutional expense category, with appropriate discussion on the reasonableness and applicability of each, comprises the greater portion of this presentation. Some remarks on direct costs are also included.

Steps in Indirect Cost Rate Determination

The first evaluation to be made is the annual operating expense of those activities supporting the primary activities of the university. For organizational purposes, support expenses are grouped into functionally related cost centers. One acceptable list of such cost centers appears in a publication[2] of HEW as follows: fringe benefits, equipment use charges, building use charges, operation and maintenance, library, departmental administration, research administration, instruction administration, and general and administrative. This particular identification of support cost centers is only one of many possible identifications. Circular A-21 emphasizes that the university has great latitude in choosing the financial description of its operation. Some schools, for example, make no use of the "Research Administration" center, preferring to include these costs in general and administrative, and departmental administration.

After all such expenses have been collected under some set of functional cost centers, the expenses identified with each cost center are allocated among the primary activities of the university, viz: instruction, organized research, public service, and all other university activities such as auxiliary enterprises. Bases commonly employed in allocating expenses among the primary activities or cost objec-

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tives are: salaries and wages, net total expenditures (total expenditures less capital expenditures), square-foot occupancy, populations (head-count or FTE), and less commonly, actual total use or estimated use inferred from data samples. The choice of allocation basis is intended to attribute to each cost objective the fractional expense proportional to the value derived from that supporting cost center. While the earlier determination of expenses attributable to each cost center is relatively straightforward and objective. the allocation of these expenses is fraught with subjective judgmental factors.

In some expense allocations, none of the above simple bases accurately reflect the value derived by a particular cost objective. In this type of situation, *weighting factors* may be applied to the simple bases in order to allocate expense more equitably in proportion to value derived. For example, if faculty are found to utilize library services at twice the rate of undergraduate students, then library expense should be allocated at twice the rate per faculty member as that applicable to undergraduate students, rather than on a simple population basis. Weighting factors appropriate to the allocation of each cost center will be discussed in detail later.

The sum of allocations from the several cost centers to each cost objective constitutes the total indirect cost attributable to that cost objective. The indirect cost *rate* is then found by dividing the total indirect cost allocation in that cost objective by some direct cost function readily identifiable with the same cost objective. This is commonly taken as direct salaries and wages on organized research, although there may be justification for preferring an alternate direct cost function to define the indirect rate. This thought will also be expanded later. We move next to the detailed discussion of allocations and weighting factors.

Fringe Benefits

A first generalization applicable to *all* expenses is that whatever *can* be direct-costed *should* be direct-costed if it is feasible and practical to do so and the approach used is consistently applied. In this way the university is assured that a dollar expended will mean a dollar recovered. Fringe benefits such as retirement, employer-paid life and hospital insurance, workmen's compensation, etc., are normally identified on payroll records in such a fashion that they may readily be included in direct costs. If the employee contract is a 12-month or fiscal year contract, an appropriate increment should be provided in the research direct salary charges (e.g., 9.09% if one month vacation per year is allowed) to cover anticipated costs of paid vacation. If the university supports a sabbatical program, an additional increment of 16.67% (or other appropriate percentage) should be provided in research direct salary charges to cover these anticipated costs. Such pools of pre-paid vacation and sabbatical expense should be held in separately identified accounts on a university-wide basis and refunded on request to academic and service units as charges in these two benefits categories are incurred.

Some educational institutions provide for remission or reduction of academic fees to spouses and dependent children of university employees. Such waivers, full or partial, constitute an employee benefit, and the negative income to the university should be prorated over all eligible employees and added to the basic hourly or monthly pay rate in direct-costing to organized research. Extension of this principle may be made to other university-supported activities in which university employees qualify for preferential fees by comparison with the general public. Examples might include golf fees, natatorium and gymnasium fees, etc.

If the university chooses to include benefits in the indirect pool, all the foregoing considerations are still applicable. Allocation bases appropriate to the employee category (faculty, staff, technical support, etc.) can be readily determined.

Equipment Use Charges

Circular A-21 provides for reimbursement for the use of university-provided capital equipment at an annual rate of 6⅔ percent of acquisition cost. No use charge is allowed for equipment purchased with federal funds, or obtained under federal excess property arrangements (except that transportation charges for the latter may be direct-costed). All non-permanent office and laboratory furniture and furnishings are included in this use category.

A simplistic approach to the allocation of equipment use charges may employ as a basis the relative square-foot occupancy of organized research activities or a relative dollar ratio within the department, college, or university. Such bases are believed to produce under-recovery of fair cost. Consider, for example, the most sophisticated oscilloscope purchased by an engineering department. Is this more likely to be found in use in the undergraduate laboratories or in the organized research area? Further, the equipment found in the undergraduate labs is subject to four to eight hours use per day, five days per week, thirty-six weeks per year on most campuses. Few doctoral students deeply engrossed in experimental research programs would content themselves with such "banker's hours." Organized research programs operate year-round.

The way to ascertain who is using what equipment is either to examine use records, or to see what equipment is where at some point in time (the "custodial responsibility" principle). Short of a total inventory survey, a reasonable sample survey should provide a fair index of relative use between instruction and organized research. Sampling methods averaged over several years will lead to more defensible measures of use. Equipment not in actual use, but equally available to both instructional and organized research activities, should be allocated on the

basis of equipment found in use, by dollar value, but not weighted by hours of use.

No studies combining relative expense of equipment with relative use weighting factors are known to the writer at this time, although the University of California system employs an unweighted "custodial responsibility" principle for allocating use charges in certain equipment categories.

Building Use Charges

Circular A-21 provides for reimbursement for the use of university-provided building space at a rate of two percent of construction cost. Buildings constructed fully or in part with federal funds are excluded fully or prorata from use charges.

Prior to the routine square-foot analysis, it is appropriate to ascertain *relative* costs of construction for the various functional areas which may be contained in the building: classrooms; offices; chemical/biological "wet" labs; anechoic acoustical or microwave facilities; and other specialized areas. Those areas wholly *assigned* to organized research activities and those areas wholly *assigned* to instructional activities should be appropriately weighted by the relative cost factors above, and allocated to their respective cost objectives. The residual space *shared* by instructional activities, organized research, department administration, etc., is then *allocated* on an appropriate dollar base among the indicated cost centers and cost objectives. These factors should also be weighted by "use-weeks."

In place of the foregoing two percent use charge, at least one major university employs a forty-year capitalization and depreciation schedule to assess use-equivalent charges on its more permanent buildings, and a twenty-year capitalization and depreciation schedule on other buildings and on improvements to capital facilities. After determining allocable costs by these methods, the allocations to cost centers and cost objectives follow a conventional square-foot basis.

Operation and Maintenance

This category of charges includes janitorial and repair services, security, fire protection, insurance, taxes, and utilities. Such charges are normally allocated on a straightforward square-foot occupancy basis, but even here, some weightings appear justifiable. While it might be difficult to prove that greater janitorial service is required to maintain a research area than to maintain a classroom, it is simple to prove that most classrooms are utilized, and hence require janitorial services, utilities, etc., for only thirty-six weeks each year, while organized research areas are humming for at least fifty weeks of each year. It should also be relatively easy to prove that a greater potential for requiring fire protection and insurance service is generated by a research lab than by a classroom. Once again, no studies are known to the writer on this latter weighting factor.

Any extraordinary utilities services appropriate to the particular research activity (e.g., special electrical or telephone service) should be separately identified and preferably direct-costed to the research activity, or wholly allocated to the organized research cost objective.

Library

The library expenses are characteristically developed and allocated in two steps. First, the total user population is identified for initial allocation of expenses, for example, on a population basis. This first classification separates faculty, student employees, graduate students, undergraduate students, non-teaching research professionals and other users. Then a second distribution of the expense identified with faculty, student employees and professional researchers is made between instruction and organized research on some appropriate basis.

It is reasonable to accept that various segments of the university will impose non-uniform demands on the library services (acquisition, circulation, inter-library loans, etc.). A study at the University of California's nine campuses demonstrated that faculty and graduate students contribute to library expense at approximately four times the rate of undergraduate students. Weighting factors appropriate to any one institution will have to be developed and defended on the results of a study of that institution. The allocation phase of expense distribution has been made to various bases: simple head-count, FTE, and salaries and wages. The appropriate allocation basis will depend on size and objectives of the university, extent of research involvement, and other factors.

Several universities have made comprehensive surveys to establish how students expend their working hours. Such studies provide a basis for the initial distribution of library expense, and may also be used in distributing student services expenses.

Departmental Administration

The academic department is the primary interface between the research project and the remainder of the university. The department is host to both organized research and instructional programs, and it is within this one house that these two functions must coexist in a mutually complementary fashion. This is frequently more easily said than done, for the very nature of the two functions makes them natural competitors for space, equipment, and support services. In research-active departments, considerable administrative effort is required to assure that both aspects of the total department program are enabled to perform effectively.

An easily-overlooked consideration is that faculty share significantly in the administration of the department

through committee work in such areas as graduate studies, curriculum, and space and equipment, to name those areas having a high degree of interaction with organized research. Some departments assign equivalent teaching-load credit for committee work, and others simply describe committee work as a "part of the professor's job." In any case, appropriate allowance should be made in departmental administration cost determination for faculty activity.

Clerical and technical support services within the department should be fully accounted for. If some portion of the hours are direct-charged to organized research, then hours specifically served in instructional activities should similarly be direct-charged, and the balance allocated.

Allocation bases for all the foregoing contributions to departmental administration and service usually follow a direct cost function that can be clearly defined between organized research and instruction, either salaries and wages, or net total direct expenditures.

The *research administration cost center* is designed to collect those expenses associated with the entire organized research activity.

In addition to the conventional services of grant and contract negotiation and accounting, this cost center may also collect expenses of proposal generation and processing (whether accepted or not), inventory maintenance on government-furnished equipment and equipment accountable under excess-property provisions, research newsletters and other periodicals describing current research activities or listing RFP's and RFQ's, administration costs of specialized research facilities, etc.

The research administration cost center is wholly allocated to the organized research cost objective. This unique fact of total allocation to organized research is a two-edged sword: An expense item assigned to this cost center appears *in toto* in the organized research cost objective; but the criteria for assigning expenses into the research administration cost center are correspondingly more rigorous, less subject to interpretation at each institution.

Perhaps for this latter reason, many larger institutions choose not to utilize the research administration cost center. Another factor, in some cases, is that the institution has grown in organized research to such an extent that a single office cannot effectively administer to the needs of a widely separated (physically and academically) collection of research activities. In this case the local administration function is absorbed into departmental administration and the central structure, which addresses policy matters primarily, is absorbed into general and administrative.

Instruction Administration

This cost center is rarely encountered in actual indirect rate proposal cases. As utilized in the example of Reference 2, it merely provides a collection center whose total is allocated wholly to the instructional cost objective. If the indirect rate proposal addresses only those cost centers which contribute to the organized research cost objective, this cost center may be deleted. It is perhaps in order to suggest that gratuitous information beyond that required to present the case merely opens the door to extraneous discussion.

General and Administrative

The general and administrative (G & A) cost center collects all those expenses which are common to all institutional activities, subject to a few exclusions, as identified in A-21. Policy and mechanics of total university dollar flow form a part of this cost center. In view of the increasingly specific federal regulations affecting accounting for utilization of federal funds, at least one major institution has justified a federal workload weighting factor which is applied to the allocation basis in distributing expenses of this cost center to the cost objectives, demonstrating through time and effort reports that more administrative service is required to process a dollar of federal funds than is required to process a dollar of non-federal funds.

Circular A-21 suggests net total expenditures as the basis for allocation, but allows for other bases if this can be shown to be inequitable. Most institutions follow this basis, with such weighting factors as are defensible.

Student Services

Student services is not identified in the cost centers of Reference 2. This cost center collects such expense items as student housing, student health, counseling, minority programs, student employment (on and off campus) and placement (upon graduation), recreation, and residence and dining halls. To the extent that student services is supported from university funds, it constitutes a benefit to the entire student body.

Because students participating in organized research spend a part of their time as wage-earners and a part of their time as "students," a portion of the expenses collected in the student services cost center is allocable to organized research on the basis of time spent as wage-earners in organized research compared to all time spent by all students as "students." Some institutions have made internal studies to ascertain students' use of time by hours, and thus have been able to express their allocation formula in terms of hours (see related comment under *Library*). It should be remembered that the weeks of employment under organized research are nearly the full year, while weeks as students are normally thirty-six per year. Lacking such a study, allocation could reasonably be made on an FTE basis, but this is almost certain to yield a lower percentage allocable to organized research because of the higher incentive associated with organized research participants as compared with undergraduate students, for example.

The Indirect Rate

At this point, some set of cost centers and allocation bases have provided a dollar figure of expenses to be distributed among the several organized research activities. This dollar figure is then divided by a direct cost function of organized research to produce an indirect *rate*. A-21 suggests direct salaries and wages as that direct cost function, but allows for the use of other bases, if more equitable distribution can be thereby demonstrated.

A persuasive reason for choosing net total expenditures as the direct cost function arises from the psyche of the principal investigator. (The writer has worked on both sides of this fence, and speaks from personal experience.) If direct salaries and wages are chosen as the direct cost function, the principal investigator is reluctant to report time and effort of salaried personnel honestly, because he correctly believes that each salary dollar charged adds an additional $0.40 to $0.70 (for typical indirect rates) to total project costs. He would much prefer to charge the project with travel, supplies, equipment, or other non-overhead-incurring expenses. Thus there is a powerful motivation at the project level to "sock the department" with as much as possible of overhead-incurring salaries. The resulting increases in "instructional" costs at the department level constitute a transparent subsidy to federal research programs. While the use of a net total direct expenditures function will not eliminate this practice, it will make honest time and effort reporting less painful at the project level.

A second reason for the use of net total expenditures as the direct cost function arises out of popular misconceptions and misapplication of the numerical value of indirect rate. In 1968, Senator Mansfield introduced an amendment to the appropriations bill (HR 18707) for the Department of Defense, as follows:

> No part of the funds provided in this Act shall be used to pay any recipient of a grant or contract for the conduct of a research project an amount for indirect expenses in connection with such project in excess of 25 per centum of the direct costs.

This amendment reportedly had the unanimous approval of the Senate Appropriations Committee, and was passed, 47 to 19, by the Senate. Only later in joint committee did the House members prevail upon the Senate to delete the amendment.[3]

Twenty-five per centum indeed! On what direct cost function? Such uninformed use of indirect cost rates, which very nearly became law, illustrates the necessity for quoting as low as possible a numerical value, hence the desirability of the broader base provided by a net total expenditures direct cost function.

Some of the institutions queried indicated greater total dollar stability in NTE than in S&W in organized research activities. A relatively minor shift in research emphasis has sometimes resulted in an exaggerated change in indirect rate, which may generate ill will from the sponsoring agency. Further, such expenses as travel, supplies, communications and reporting do, in fact, generate indirect costs, so that they should reasonably be included in the direct cost function for establishing indirect rates.

Applications of Indirect Cost Rate

For purposes of organized research negotiation and execution, four types of indirect cost application are used:

1. Provisional, wherein a temporary rate is established for payment purposes, subject to cash adjustment at specified periods, or on contract termination.
2. Final, a post-determined rate covering some accounting period based on the actual expenses during that period.
3. Predetermined, a fixed rate based on experience, to be applied without adjustment to some future period.
4. Fixed Rate with Carry-Forward (FRCF), similar to the provisional, except that cash adjustment is replaced by rate adjustments (positive or negative), to be applied to future accounting periods.

It is seen that provisional, predetermined, and FRCF rates are utilized to provide timely payments of operating expenses to the institution, while the final rate is used to define corrections to be retroactively applied to provisional rates, and also as a basis for future predetermined rates.

Internal Considerations and Conclusions

The university controller, or whichever officer prepares the indirect rate case, has two battles on his hands in defending his case. In addition to the external discussion and negotiation with the federal auditing team, an equally important internal conflict arises with the university's own faculty. The faculty, with few exceptions, are remarkably uninformed on the many internal cost increments generated by a substantial organized research program on campus. They, like some members of the Congress, regard the recovery of indirect costs as some form of "profit" to the institution, and view an increase in the indirect rate as lessening their chances of having a proposal accepted. A pamphlet, *Indirect Costs of Research*, recently released by the University of Michigan,[4] sets forth in most persuasive terms the rationale and necessity for indirect cost recovery.

The several weighting factors and alterative approaches suggested by the foregoing paragraphs may be employed to increase total cost recovery (direct plus indirect) at the university level. The success of such an effort clearly depends on having the faculty "on your side." A part of gaining faculty support is accurate and complete information flow in both directions. A second part is recognition of faculty efforts toward fuller cost recovery by means of the budgeting process.

What posture should the university assume as a result of these combined pressures to hold down indirect rates vis-a-vis mounting internal expenses of accommodating the organized research program on campus and diminishing dollar flexibility in funding sources? If the institution is to survive fiscally, the organized research component must contribute its "fair share" to those university expenses which are of an indirect nature. And if the institution is to retain a capable research faculty, the faculty must be informed and willing to support that recovery.

This presentation was intended to provide the reader with a perspective on indirect costs in sponsored research and an indication of the type of flexibility available within the provisions of Circular A-21 as currently exercised at several institutions, to the end that maximum equitable cost recovery may be accomplished at all institutions.

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