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Paying for the Research Juggernaut

By [John V. Lombardi](#)

A recent flurry of concern about [new rules proposed](#) by the National Institutes of Health to limit the reimbursement for some costs universities incur when performing research for the federal government highlighted the remarkable financial structure of academic research. Universities, contrary to the beliefs of some external observers, spend large amounts of their own money to acquire research contracts.

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Every time the federal government reduces the reimbursement for a cost of doing federal research, the universities have to spend more of their own money to perform the research required by federal grants.

Although university research is a money-losing enterprise in the business sense, a large number of academic institutions compete for federal dollars to support their research enterprises, and most research oriented campuses expect their faculty, especially in the sciences, to submit grant applications and win awards from the federal research establishment, whether NSF, NIH, or other agencies.

Indeed, for many academics, the success of a campus in acquiring federal funds serves as a primary indicator of quality and prestige. Many rankings systems, including the classifications developed by the author and colleagues published annually as *The Top American Research Universities*, rely heavily on a campus's federal research expenditures when distinguishing among institutions.

But those campuses in search of higher prestige among their peers must invest at an increasing rate to move up in the rankings, a process that may strain the budgets of institutions already challenged by reductions in state funding and growing resistance to increased student fees.

People often imagine that the large amounts of federal grants received by competitive research universities represent a profit or at least a break-even proposition for the institutions. Not so, in almost all cases. A federal grant of \$12.5 million will cost the university at least \$17.5 million (or an additional \$5 million) to do the research. Those who imagine that a college's acquisition of a federal grant produces a profit, as would a business's contract to supply the government with airplanes, may find the university's intense competition over money-losing grants perplexing. Let's look at the balance on this \$12.5 million grant, and let's assume that like many such grants it supports research over five years.

We divide the \$12.5 million into two parts: \$10 million in direct costs for doing the specific work required by the grant, and \$2.5 million to pay for the overhead, or indirect, costs of heat, light, space, library and so on.

Here's what we promise the federal government in order to get the \$12.5 million grant:

- We agree to pay for the part of the salaries of the two key faculty members who will do the research out of our own budget. The federal agency requires them to work 50% of their time on the grant; the total combined annual compensation for the two is \$200,000; so we agree to pay \$500,000 (that is, \$100,000 per year for the five years of the grant) to do the work.
- We also agree that although our faculty are terrific, we will need an additional faculty member or highly qualified technician to work full-time on the grant at a rate of \$100,000 per year for the five years, or an additional \$500,000, and we agree to pay for this expense.
- We also agree that the work of this grant is such that we will need to renovate some space for a very high tech laboratory and purchase on our own account some specialized equipment just for this grant at a cost of perhaps \$1.5 million over the period of the grant.

The total we've agreed to spend in direct costs from our own funds to perform the work funded at \$10 million by the government is \$2.5 million.

Then there's the indirect cost or overhead. The government will expect us to offer to pay \$2.5 million, or half of the \$5 million audited indirect cost, on the \$10 million of direct costs.

The university balance for just this one grant looks like this:

Campus Direct Costs to Perform the Grant \$12.5 million

Federal Payment to Perform the Grant \$10 million

Campus Indirect Costs to Perform the Grant \$5 million

Federal Payment for Indirect Costs \$2.5 million

Campus Total Cost of Grant \$17.5 million

Federal Total Payment for Grant \$12.5 million

Cost to Campus of Grant \$5 million

Federally funded research takes place at a significant cost to a university's budget. Success in winning these grants requires not only the financial resources to hire and sustain the very best faculty, staff and students, but also the financial resources needed to subsidize the work funded in part by the federal government. To be successful, an institution must generate substantial surplus revenue in its operating budget. This surplus revenue to support research comes from a relatively well defined set of sources, although in different proportions depending on the institution.

Universities with research intensive medical centers often use some combination of clinical revenue, gifts and endowment from grateful patients, and hospital subsidies to provide a substantial margin for reinvestment in research performance and the acquisition of research grants. Campuses with large portfolios of patent and

license agreements can generate a significant surplus for reinvestment in research.

Large enrollments or substantial tuition and fee payments may generate a surplus from instructional programs to support some part of the research environment usually related to the acquisition of high quality faculty. State legislatures that value the economic development significance of academic research provide special appropriations in support of construction, equipment, and salaries. Public and private institutions with large endowments often have special funds that pay the costs of nationally competitive faculty, graduate student stipends, construction of research space, and other elements in support of highly competitive research performance.

This research juggernaut has a self-reinforcing dynamic. Each research grant achieved requires a campus investment on the order of 20 to 30 percent. To justify that expense, institutions highlight the prestige and increased national prominence that comes from the successful acquisition of federally funded grants. In addition, a university can rarely subsidize just one grant.

To compete for life sciences research, for example, the campus must have buildings with the high-tech research space essential for modern life sciences research. Once constructed, the building must fill up with federally funded research, because even the partial overhead cost the federal government pays reduces some of the debt service on the building. Moreover, having built the research space, the institution must demonstrate the wisdom of its investment by encouraging the faculty to compete even more intensely for additional grants (which in turn require more institutional investment). Trustees, recognizing that research growth is a prime indicator of institutional competitiveness, ask for periodic reports on the increases in federally sponsored research expenditures, creating a strong incentive for campuses to increase their investment in research support, although in most cases the trustees do not ask what it cost the institution to acquire additional research.

Is all this a bad thing?

Certainly not for the federal government, which funds research, primarily in a financial partnership with institutions, that receives for the nation much more research benefit that it actually pays for. Certainly not for the nation, whose international competitiveness has rested in large part on the commercialization of campus-based research results. Certainly not for the states, whose investment in the research of land-grant institutions alone has sustained and advanced state economies since the second half of the nineteenth century. Certainly not for donors, whose pride in their gifts and endowments comes from having enabled remarkable advances in every area of academic study.

Certainly not for entrepreneurs, whose commercialization of patents and businesses based on licenses of university research creates great wealth. Certainly not for graduate students or postdocs, whose academic and research preparation benefits greatly from the opportunities to develop skills and abilities through the university research establishment. Certainly not for research faculty, whose compensation and support for their research programs receive continued and increasing investments. Undergraduates can benefit, too, if they find their way to an on-campus research opportunity or engage with the highly accomplished research faculty and graduate students.

Research quality, like all university quality, comes from an investment in people, facilities and support. Quality is scarce and highly sought after. Consequently, in the academic world as is true everywhere else, the cost of high quality continues to rise. Over the past generation, the competition for research quality has grown to encompass not only the traditional private and large public flagship institutions, but also second and third generation public institutions, as well as small elite private liberal arts colleges, all of which seek to acquire academic research faculty stars to grace their campuses.

The accelerating engine of academic research, as is true of the competition for the best students or the best collegiate athletes, requires ever increasing revenue to invest in the competition for quality that determines success. The more success in acquiring federal research, the more money the campus must generate from other sources to sustain that success. The result is an intense focus on private fund raising opportunities, state subsidies for research, corporate-university alliances, commercialization of intellectual property, and other revenue enhancing activities.

Like the arms race for high visibility intercollegiate sports programs, the research competition, among academic institutions large and small, drives budget priorities. This competition is a powerful motivator because like sports programs, science based research in particular offers a clear scorecard of results. For institutions with substantial research programs, this measure of success may be entirely appropriate, but for those seeking to enter the top

half of the research competition, the effort to compete may require the neglect of other, less easily measured parts of their academic enterprise. An effective research strategy should measure not only the won-loss record but also the cost to compete.

It's no wonder, given this process, that university representatives react with alarm at every attempt by government agencies to shift more of the cost of research from the government to the academic institutions.

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