

FINANCES OF RESEARCH UNIVERSITIES

June 2014

The Council on Governmental Relations (COGR) is an association of leading universities and research institutions. Member institutions conduct over \$60 billion in research and development activities each year and play a major role in performing basic research on behalf of the federal government. COGR brings a unique perspective to regulatory and cost burden and focuses on the influence of federal regulations, policies, and practices on the performance of research and other sponsored activities carried out at COGR institutions.

This paper describes the financial landscape of research universities and advocates for active collaboration among all stakeholders to address financial risks in a productive manner. The paper is divided into three parts:

- Part I. Overview of the Financial Landscape
- Part II. Research Funding and Financial Implications
- Part III. Future of the Government–University Partnership

The paper identifies unrestricted and restricted sources of university funds and the typical uses of such funds. Charts illustrate structural differences between public and private research universities. Financing of sponsored research is explained. Data regarding the cost of conducting federally-funded research is presented, as well as reasons for under-recovery of legitimate expenditures and the extent of university contributions to research. The paper closes by identifying the challenges of maintaining a viable and healthy federal government–university partnership and sets the stage for dialogue to address those challenges.

COGR published prior versions of “Finances of Research Universities” in 2003 and 2008. This updated version builds upon both prior versions while providing comparative analysis, when appropriate.

A Research University is ...

... an institution committed jointly to instruction, research, and public service. These activities are inextricably intertwined and require the necessary infrastructure to encourage and support faculty and students in the pursuit and conduct of research.

A *research university* is not a member of a discrete or exclusive group. Several analyses that follow identify a specific cohort of universities. Apart from those specific examples, any reference to a *research university (universities)* is meant to capture all universities and organizations that consider research a significant part of their mission.

This paper focuses on the three-fold mission of *instruction, research, and public service* common to research universities. The land-grant designation, shared by some universities, is usually included under the mission of public service. In recent years, many universities have embraced economic development as a fourth mission. For institutions with a hospital and/or clinical practice, providing medical services constitutes a fifth mission. While economic development and medical services are important areas of study, they are outside the scope of this paper.

PART I. OVERVIEW OF THE FINANCIAL LANDSCAPE

Whether a research university is public or private is an important variable to consider when analyzing finances. Historically, the primary revenue source for public universities was state appropriations. However, state appropriations have suffered severe declines over the past decade. As the percentage of operating budgets funded by the state decreases, public universities exhibit more financial similarities to private universities. Furthermore, for public and private universities, efforts to minimize tuition increases has put pressure on all other revenue sources, resulting in an increasing dependence on private gifts and investment income from the university endowment.

Following is a snapshot of the primary revenue streams, expense categories, and assets and liabilities of public and private research universities.

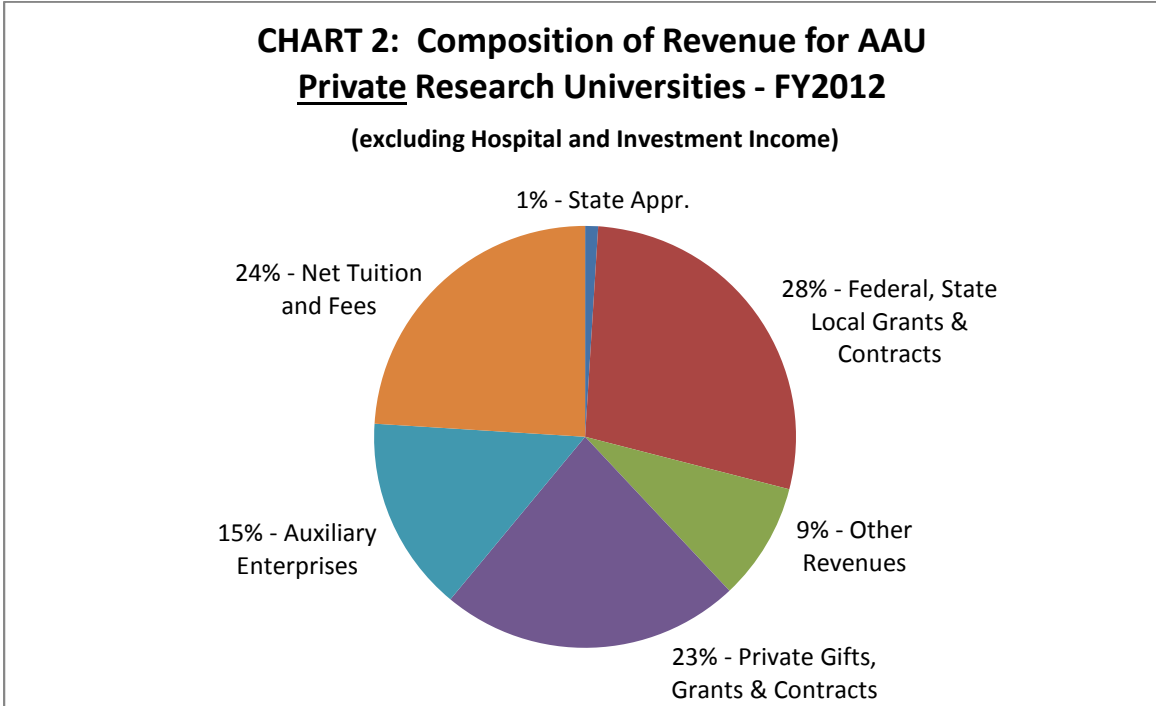
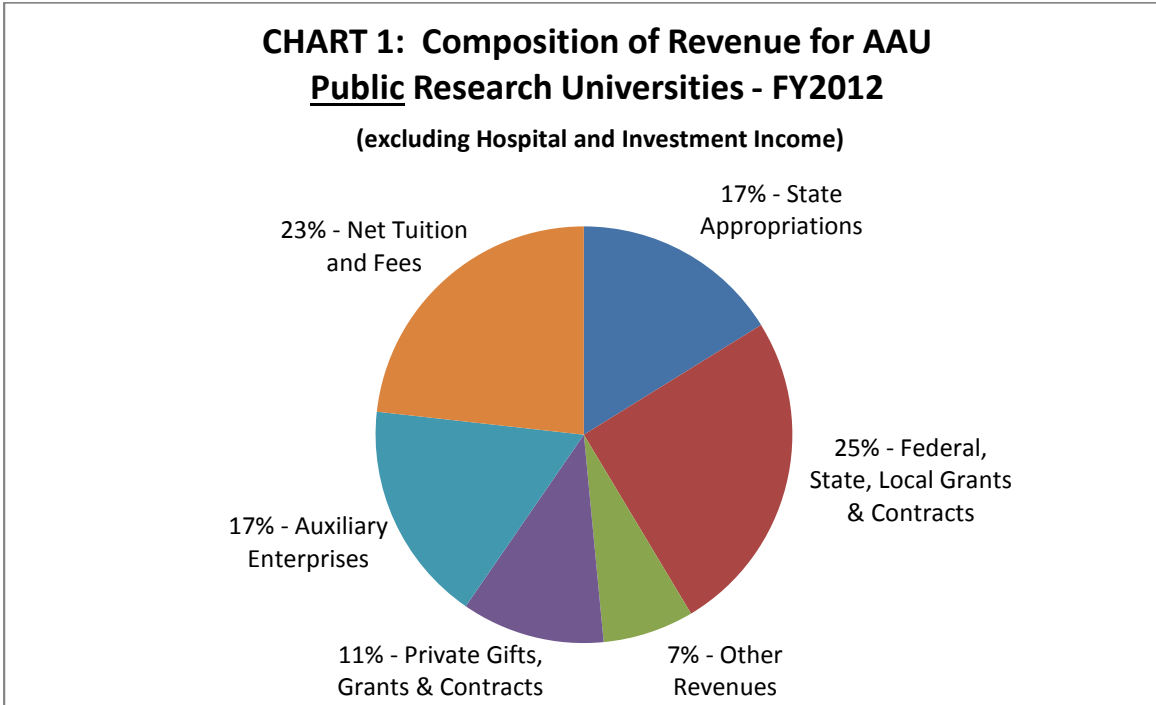
The Operating Statement

Sources of Revenue

Sources of revenue for both public and private research universities can be divided into unrestricted and restricted resources. Unrestricted resources can be used *at the discretion of the institution* for the primary missions of teaching, research, public service, or any other activity. The primary unrestricted sources for operations are state appropriations (public) and tuition (both public and private). Restricted resources are those that are *limited in use by third parties*, such as donors and research sponsors. Restrictions are typically related to the use of the resources for a particular organizational unit (e.g., the physics department), to a particular purpose (e.g., music scholarships), or to a specific activity (e.g., NIH-funded cancer research).

Charts 1 and 2 on the next page show the composition of revenue sources (excluding hospital revenues and investment income) for public and private research universities, respectively. The data represent 31 public and 26 private research-intensive Association

of American Universities (AAU) member institutions. The same cohorts of institutions were used in the 2003 and 2008 versions of this paper.



Source: Fiscal Year 2012 Integrated Postsecondary Education Data System (IPEDS), a survey provided annually to the Department of Education.

Revenue sources represented are as follows:

State Appropriations. Provide partial funding for the general operations of the institution. Federal appropriations provided to land-grant institutions and local appropriations (provided to only three institutions in the data set) are included but account for less than two percent of this category. Use of these funds is unrestricted.

Net Tuition and Fees. Revenue resulting from charges to students. Published tuition rates normally are discounted to a significant extent on a needs-based formula. Only net charges are realized by an institution. Use of these funds is unrestricted.

Federal, State, Local Grants & Contracts. Federal, state, and local government awards to fund research and other sponsored activities. Almost 95 percent of the funds reported in this category for the AAU cohort of institutions is federal funding. Use of these funds generally is restricted with the exception of amounts collected for reimbursement of facilities and administrative (F&A) costs (see Part II, p. 14).

Private Gifts, Grants & Contracts. Gifts from donors and awards from industry, nonprofit foundations, and other private organizations to fund research and other sponsored activities. Use of these funds generally is restricted with the exception of amounts collected for F&A reimbursement. Some private gifts may not be available for programmatic and operational expenses during the year reported. Instead, these gifts typically increase the endowment principal or are used to construct new facilities.

Auxiliary Enterprises and Other Revenues. *Auxiliary enterprises* generally are self-supporting activities that provide services to the university community (including students, faculty, and staff) and to the public. Examples include university housing, intercollegiate athletics, bookstores, and dining. These activities generally receive no financial support from other sources unless they are deemed a critical aspect of the academic mission. *Other revenues* include other sources of revenue not reported in the listed categories.

Chart 3 on the next page compares FY2012 revenue composition between the 31 public and 26 private research universities in the AAU.

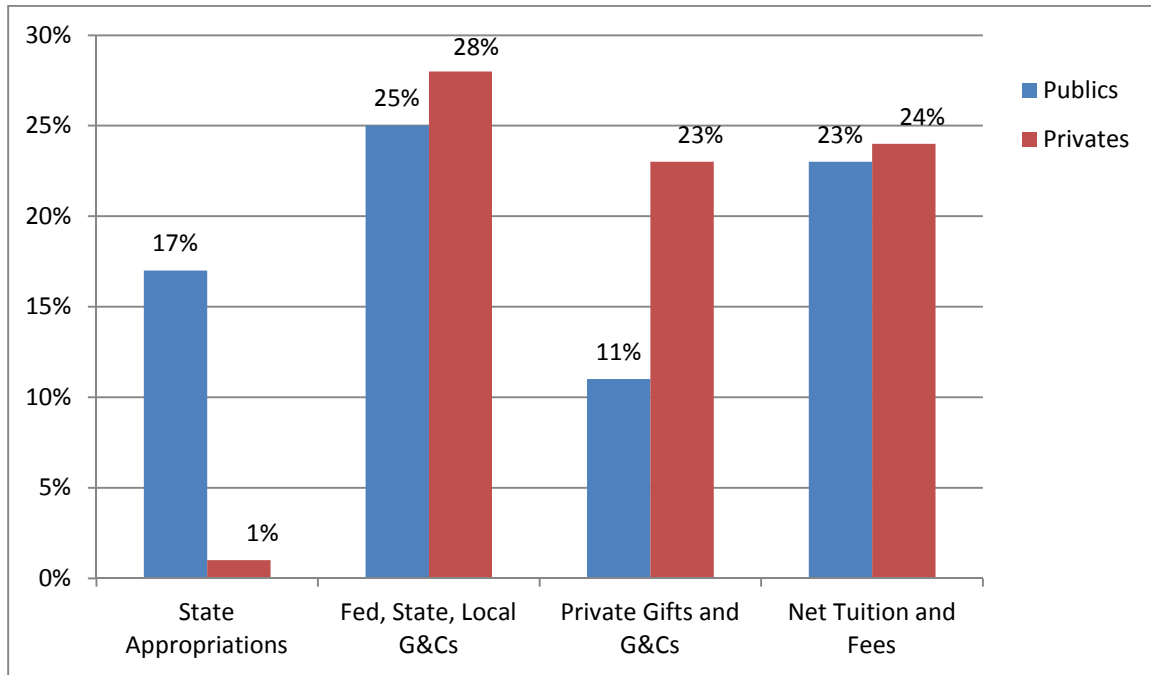
CHART 3: Revenue Composition Comparison (AAU Cohort): FY2012

Chart 3 illustrates the following notable observations:

- **State appropriations represent the major difference** in revenue sources between public and private research universities. With the exception of one private university that serves as its state’s land grant institution, state appropriations are not applicable to private research universities but are a significant (though diminishing) revenue source at public research universities.
- **Federal, state, and local grants and contracts are the number one revenue source** for both public and private research universities from the AAU cohort. With the majority of funds in this category from federal sources, as noted above, federally-funded research plays a significant role at both public and private research universities.
- **Awards from private industry and nonprofit foundations** to fund research or other sponsored activities similarly enhance the research enterprise at both public and private research universities. Historically, donor gifts have played a larger role at private universities. However, in light of diminishing state appropriations, public research universities increasingly pursue this revenue source to fund current operations, the endowment, and capital projects.
- **Net tuition and fee revenue contribution for public and private research universities is essentially equal.** Historically, net tuition and fees have been a primary source of revenue for private universities while being a secondary source of revenue for public universities. This is no longer the case as net tuition and fees now are a primary source of revenue for public universities as well (see “The Tuition Dilemma for Public Universities” below).

Changes over Time

Finally, **Charts 4 and 5** show longitudinal changes in selected revenue source contributions. While the changes over time for private research universities from the AAU cohort are less significant, changes for public research universities from the AAU cohort demonstrate an important and concerning shift in the funding landscape.

CHART 4: Public Research Universities: 2001, 2006, 2012

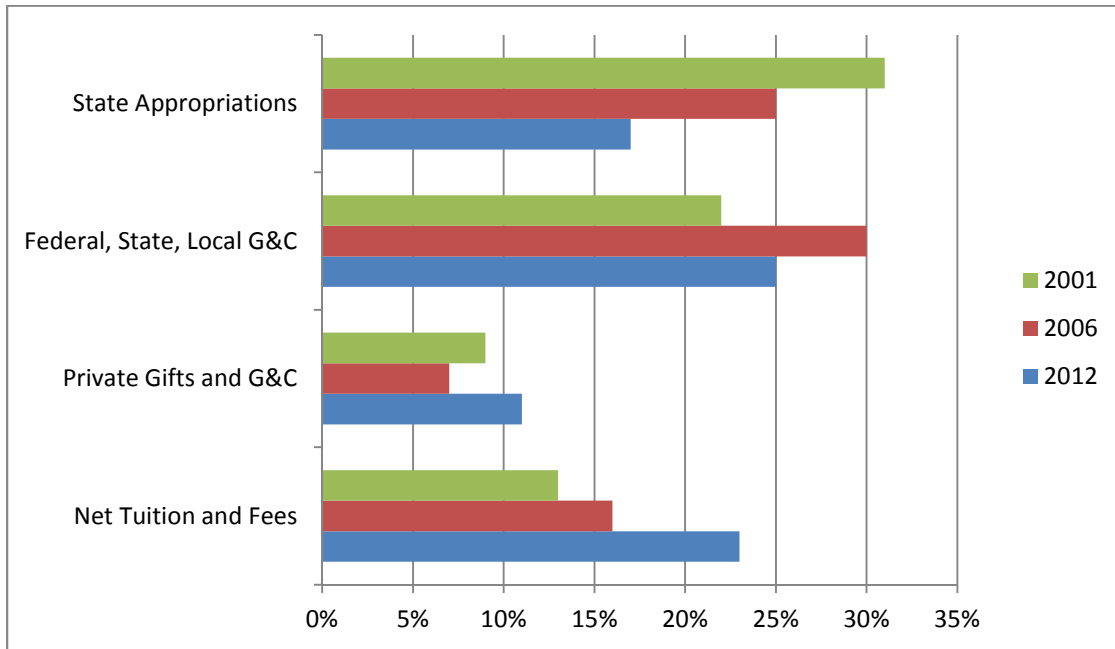
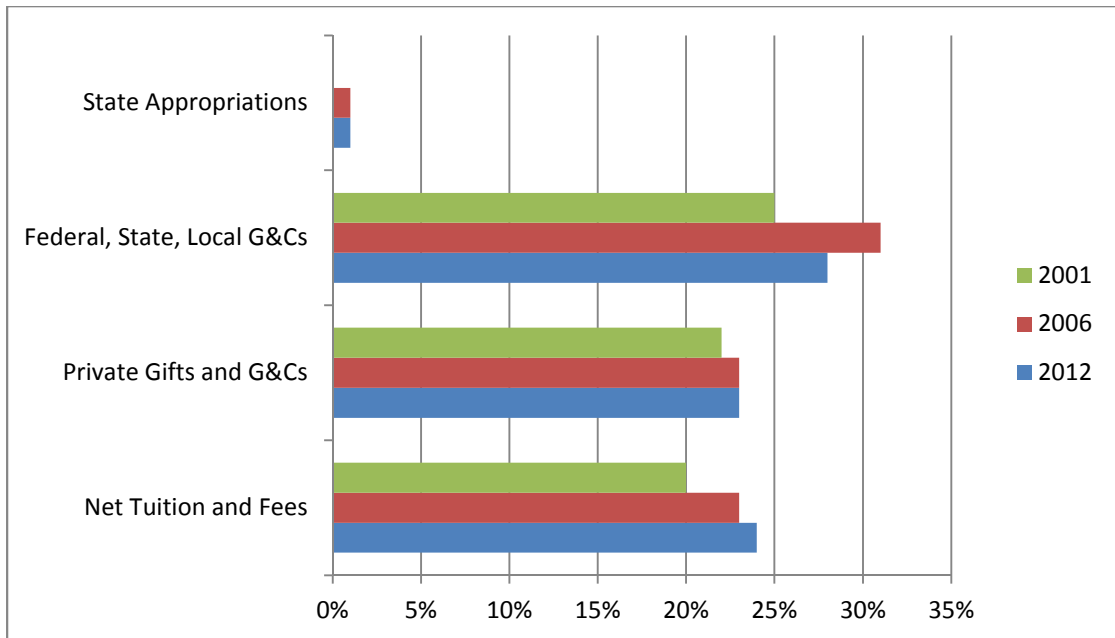


CHART 5: Private Research Universities: 2001, 2006, 2012



The Revenue Challenge for Public Universities

In 2001, state appropriations constituted the largest source of revenues to AAU public research universities (31%). By 2012, however, state appropriations had decreased as a percentage of total revenues (17%) and had been supplanted by federal, state, and local (primarily federal research) grants and contracts as the primary revenue source (25%, from 22% over the same period). Most notably, contributions from net tuition and fees increased from 13% to 23%.

Historically, private universities (those in the AAU cohort as well as private universities in general) have relied on net tuition and fees as a consistent revenue stream more so than public universities. On the other hand, public universities (those in the AAU cohort as well as public universities in general) depended on state appropriations. The consistent stream of state support allowed public universities to rely less on revenues derived from net tuition and fees and reinforced a strong state–public university partnership. In the past decade, however, public universities have experienced a continuing trend toward lower levels of state support, as shown in Chart 4.

The state–public university partnership, in turn, has suffered. Even though public universities may have experienced real-dollar increases in state support over time, the percentage of revenue, and the important metric of state appropriations per student, has decreased dramatically. The National Science Board reports:

Several factors are associated with the decline in per student state appropriations over the last decade ... College enrollment has increased consistently ... At the same time, state appropriations have not kept pace. A report by the State Higher Education Executive Officers Association indicates that while the overall level of state support for higher education has increased over the last 25 years it has failed to keep pace with rising enrollment and inflation. As a result, state appropriations per student (measured in constant dollars) declined to a 25-year low in 2011. (*Diminishing Funding and Rising Expectations: Trends and Challenges for Public Research Universities*, 2012, p. 12)

The National Research Council of the National Academies reports:

However, an alarming erosion in state support for higher education over the past decade has put the quality and capacity of public research universities at great risk. State cuts in appropriations to public research universities over the years 2002 to 2010 are estimated to average 25 percent, ranging as high as 50 percent for some universities—resulting in the need for institutions to increase tuition or to reduce either activities or quality. (*Research Universities and the Future of America – Summary Version*, 2012, p. 6)

The National Research Council report (p. 6) also illustrates a decrease in “real state and local appropriations per full-time student” by comparing 1989 and 2007 support:

- Down 9.4% (from \$8,050 to \$7,289) at “high research” public universities
- Down 14.3% (from \$12,251 to \$10,505) at “very high research” public universities

Such significant declines in state appropriations challenge senior financial officers at public universities in their ability to provide the necessary resources to support the multiple missions of their institutions. Under these conditions, public universities cannot avoid an increased dependence on federal, state, and local grants and contracts; private gifts, grants, and contracts; and net tuition and fees as other sources of revenue.

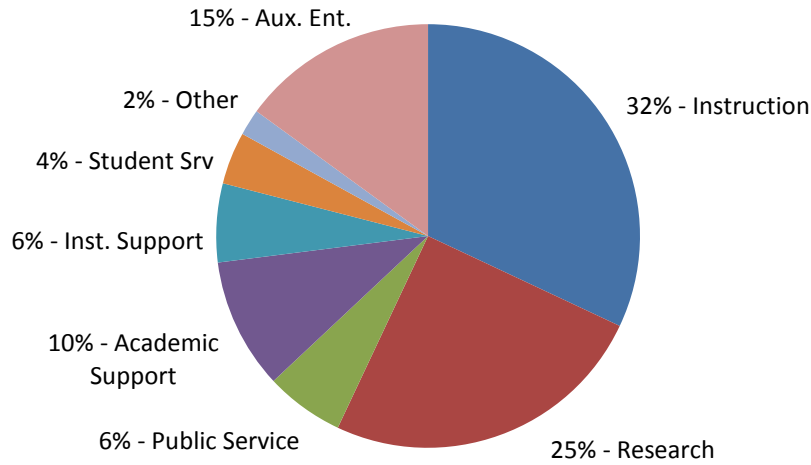
Net tuition and fees, however, are not easily drawn on for increased support. Public universities are constrained by multiple factors in determining tuition rates. Restrictions are embedded in state statutes, and potential tuition increases are harshly analyzed under the assumption that higher education is a public good and should be accessible to all state residents. The public sometimes perceives tuition increases to be the result of inefficient administration when, in fact, decreasing state appropriations are more often the cause. Until state legislators and other leaders address this core issue, managing the varying sources of revenue will remain a financial challenge for public universities.

Uses of Funds and Expenditures

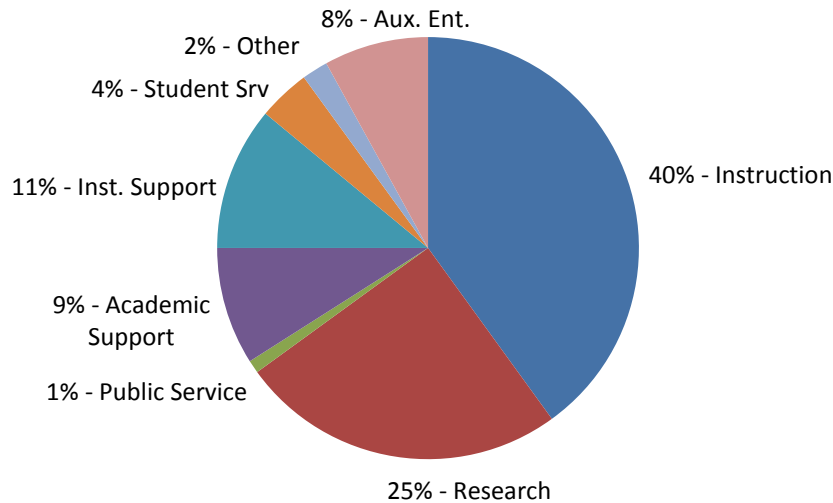
The flipside of revenue source analysis is a look at the uses of funds, or expenditures. In some cases, such as when the revenue source is restricted, there is a closer relationship between revenues and expenditures. For example, revenue that supports a federally-sponsored research program is required by the sponsor to have a one-to-one relationship with the expenditures for that program. On the other hand, revenue sources that are unrestricted, such as state appropriations and tuition, support a wide range of institutional activities, including teaching, student services, and administration; the one-to-one revenue-expenditure relationship does not exist. Instead, a single, limited pool of unrestricted revenue is expended according to the competing needs and priorities of the university.

Charts 6 and 7 on the following page show the expenditure patterns, by program category, of the AAU public and private research universities defined previously (“Sources of Revenue,” p. 2).

**CHART 6: Composition of Expenditures for AAU
Public Research Universities - FY2012**
(excluding Hospital Expenses)



**CHART 7: Composition of Expenditures for AAU
Private Research Universities - FY2012**
(excluding Hospital Expenses)



Source: Fiscal Year 2011 Integrated Postsecondary Education Data System (IPEDS), a survey provided annually to the Department of Education.

The expenditure patterns highlight many similarities and only minor differences. Furthermore, the data trends over time suggest very little change in composition by expenditure category; consequently, longitudinal data from 2001 and 2006 is not shown. However, some observations from the 2012 data include:

Instruction, Research, and Public Service for both public and private universities in the AAU cohorts account for the majority of research university expenditures (63% and 66%, respectively). Public universities have a larger proportion of public service expenditures, primarily due to the land-grant missions of a number of these institutions.

Academic Support (including libraries and information technology) and *Student Services* (including career planning and placement, counseling, registrar, admissions, and financial aid offices), combined, constitute 14% of expenditures for public universities and 13% for private universities.

Institutional Support at 6% for public universities and 11% for private universities includes operational costs such as payroll, human resources, administrative computing, and fundraising. State or system offices provide functions such as payroll, purchasing, cash management, and debt management at some public universities. When this is the case, the corresponding expenses are not reflected in the university's financial statements.

Auxiliary Enterprises amount to 15% of expenditures for public universities and 8% for private universities. (Athletic programs at public universities generally are larger than similar programs at private universities; this may account for the disparity.) Auxiliary expenditures often are directly tied to the revenues generated since these operations are expected to be self-supporting.

Other includes other uses of funds not reported in the listed categories.

Scholarships and Fellowships (S&F) is not shown, and reporting methodologies vary across institutions. S&F represent financial packages made available to students based on achievement. Total expenditures for S&F alone understate the breadth of achievement-based and need-based financial support provided by universities to students. Need-based tuition discounts and tuition remission, which can be significant, often are not reported in the S&F category. Instead, such costs are reported as an offset to tuition revenue under *Net Tuition and Fees* (see p. 4).

Depreciation, Interest, and Operations and Maintenance are categories that are not shown. Financial statement reporting standards often require institutions to report these expenditures with the specific missions (e.g., instruction, research, public service) they support.

The Balance Sheet

Property, Plant, and Equipment

The two largest asset groups for research universities typically are property, plant, and equipment (PP&E) and the market value of the endowment. PP&E, or tangible fixed assets, include buildings, infrastructure (e.g., sewers, lighting), equipment, and computer systems (hardware and software). In accordance with generally accepted accounting principles (GAAP), the value shown on the balance sheet is the historical acquisition cost after depreciation. Thus, a newer physical plant is reflected on the balance sheet at a higher undepreciated value and is typically accompanied by larger liabilities because the new capital is financed in whole or in part using debt instruments. For public universities, capital construction and acquisitions may be funded by the state with the asset shown either on the balance sheet of the university itself or on the balance sheet of the state. The corresponding liability will not be disclosed on the university's balance sheet if debt service payments are made by the state.

Changes in technology and the ongoing need to upgrade equipment, facilities, and infrastructure have a significant impact on the balance sheet. In the past decade, many universities have invested heavily in administrative information systems such as enterprise resource planning (ERP) and web-based technologies. In addition, public and private institutions maintain active capital programs to invest in new research facilities. These facilities are financed with debt, private philanthropy, state support (in the case of public universities), and/or institutional funds.

University Debt and the Importance of Financial Credit Ratings

The amount of debt carried on a university's balance sheet (or in the cases of some public universities, on the balance sheet of the state) is a key factor affecting the university's credit rating. The credit rating determines university access to capital markets and the corresponding cost of capital (i.e., the interest rate available on debt arrangements) and, as such, has a significant impact on university finances.

Moody's Investors Services is a primary credit rating agency whose credit ratings and overall outlook for financial viability are determined by a number of factors. In the case of research universities, one of those factors is the amount of debt carried on the balance sheet, as described above. Other factors include prospects for tuition revenue growth, the student loan burden and rate of default, the level of regulatory and accreditation risk, patient care revenues (for universities that own hospitals), and the governance and management prowess of the university. The Moody's credit rating scale is well-known, where ratings of Aaa to Aa3 indicate an extremely strong financial position, A1 to A3 a very strong position, Baa1 to Baa3 an adequate position, and anything below (i.e., speculative grade, or SG) indicates varying levels of financial vulnerability.

Research universities covet the Aaa-Aa3 rating, which ultimately provides the best access to capital markets and the least expensive debt arrangements. In its 2013 analysis of 228

four-year public universities and 282 private colleges and universities, Moody's Municipal Financial Ratio Analysis (MFRA) found the following:

CHART 8: Summary of Moody's Debt Ratings

	Number of Institutions in Cohort	Total Rated Debt Outstanding	Median Rating by Number of Institutions	Median Rating by Weighting the Amount of Rated Debt
Public	228	\$124.3 billion	Aa3/A1	Aa2
Private	282	\$ 85.3 billion	A2/A3	Aa2

The MFRA shows public and private universities rated highly for their overall financial stability and credit worthiness. However, a 2013 Moody's report, "U.S. Higher Education Outlook Negative in 2013," addresses risks to the financial stability of the sector. The report identifies risk factors, including an uncertain revenue outlook, federal budget cuts to research, and changing university business models and governance and strategic leadership. Education and industry leaders counter the Moody's report, suggesting that higher education institutions, in fact, have adapted and survived through the most damaging financial crisis since the Great Depression, and consequently, a cautious optimism is appropriate. Nevertheless, the named issues exist and impact the financial sustainability of all universities.

Role of the University Endowment

As stated above, the two largest asset groups for research universities typically are PP&E and the market value of the endowment. In the case of the highest-volume research universities in the nation, many record their endowment as the largest asset group. Typically, private institutions have larger endowments than public institutions. In the 2012 NACUBO-Commonfund Study of Endowments (NCSE), the National Association of College and University Business Officers (NACUBO) reported that total FY2012 endowment assets for all colleges and universities were approximately \$406 billion. Of this total, private university endowments accounted for \$282.3 billion (69.5%) and public university endowments accounted for \$123.7 billion (30.5%). In the 2006 NCSE, NACUBO reported \$245 billion (72.1%) and \$95 billion (27.9 %) for private and public universities, respectively.

Endowments generally are an invested portfolio of donated assets intended to provide support for the institution through market appreciation and current income. In most instances, the donor expects the principal to be managed in perpetuity and designates the income to support specific purposes so that the institution and generations of students and faculty receive at least consistent levels of support for many years into the future.

In some cases, investment income generated by the endowment is used to supplement other revenues in support of general operations of the university. These distributions may fund instructional programs, scholarships, research, building maintenance, and other

activities supporting the university missions. Expenditures are captured in the related program categories (see “Use of Funds and Expenditures,” p. 9). Endowment distributions normally are treated as an internal transfer or as a separate source of revenue depending on institutional financial reporting policies and GAAP requirements. Because many institutions do not treat these distributions as a separate source of revenue, “Sources of Revenue” above (p. 2) excludes them from analysis.

Institutions with the largest endowments typically are well-established, research-intensive, private universities, and the investment income earned on the unrestricted portion of the endowment provides flexibility to make more substantial distributions to the institution's annual operating budget. As a result, the better-endowed private research universities generally have greater total financial resources available, per student, than their public counterparts. Using such private research universities as a model, some public research universities have increased focus on fundraising in order to grow their endowments.

In the financial crisis of 2008, endowment funds suffered huge losses, effectively drying up any investment income available for general operating funds. This was an important reminder that employing prudent investment and distribution practices is a bedrock principle of sound endowment management and financial stewardship, and that institutions must take care to manage their endowments judiciously in order to weather volatility in financial markets.

PART II. RESEARCH FUNDING AND FINANCIAL IMPLICATIONS

Part II explains the costs of research and how sponsors reimburse research universities with a focus on the mechanics of the reimbursement process; contributions that universities make to the research enterprise; and limitations on reimbursement, which can significantly impact the finances of research universities. Misunderstandings between federal policymakers and research universities arise from the complexities of research expense and reimbursement. This section addresses these concerns and related issues.

Sponsors, including the federal government, private industry, state and local governments, and nonprofit foundations, provide funding to universities for research in the form of grants, cooperative agreements, or contracts, usually through a competitive process. Awards generally include funds for the direct costs of research as well as facilities and administrative (F&A, or indirect) costs, both of which are real costs incurred by the institution to conduct research.

Direct Costs

Direct research costs are what people generally think of when it comes to federal support of research projects. These costs solely support research that is about to take place and often include laboratory supplies, specific research equipment, salary support for researchers and lab personnel, and travel for conducting research or disseminating research results. This is the core of university research, and it is also where the bulk of the federal investment is spent.

Facilities and Administrative (F&A) Costs

In order to perform research on behalf of federal agencies, universities incur a variety of other significant costs both leading up to and during a specific research project that they would otherwise not incur. F&A costs cover the portion of these infrastructure and operational costs related to federally-funded research. Such shared costs include the maintenance of sophisticated, high-tech labs specifically designed for cutting-edge, federally-sponsored research; utilities such as light and heat; telecommunications; hazardous waste disposal; and the infrastructure necessary to comply with various federal, state, and local rules and regulations.

From the Association of American Universities (AAU) and the Association of Public and Land-grant Universities (APLU). "Understanding the Costs of Federally Sponsored Research at Universities," October 2013.

Federal policymakers and investigators who conduct research projects generally recognize the necessity of the direct costs of research, including salary support for investigators and graduate students, supplies, and sophisticated equipment. F&A costs, on the other hand, are often devalued for primarily two reasons: (1) some stakeholders view the F&A budget category as diverting funding from direct costs, and (2) the reimbursement mechanism for F&A costs (i.e., the “F&A rate”) is complex and thus difficult to explain and to understand.

More sponsored research funding would, in fact, be available for direct costs in the absence of F&A cost reimbursement. However, universities cannot implement research programs if sponsors do not support the real costs of research infrastructure and compliance activities. Construction and maintenance of state-of-the-art research laboratories and administrative efforts that ensure compliance with federal rules and regulations are necessary investments.

To the second concern, the Office of Management and Budget (OMB), through OMB Circulars and related guidance, defines rules for reimbursement of F&A costs by way of federally-negotiated F&A rates. F&A rates are:

- **Calculated** by the university according to rules defined by OMB and based on audited university financial data;
- **Submitted** to the rate-setting cognizant agency (either the Department of Health and Human Services’ Division of Cost Allocation or the Office of Naval Research Indirect Cost Branch);
- **Reviewed and/or audited**, rigorously, by the rate-setting cognizant agency;
- **Negotiated** between the university and the rate-setting cognizant agency and normally are effective for a period of two to four years; and
- **Charged** by multiplying the negotiated F&A rate by the direct costs of the sponsored research project.

Specifically, a university determines F&A costs by applying the negotiated F&A rate to a subset of the direct costs of the research project – this subset is known as the “modified total direct costs”, or MTDC. Through the OMB Circulars, OMB specifies those items that are included in MTDC and those that are not in order to ensure equitable allocation of F&A costs. The items excluded from MTDC are generally direct costs which are assumed to not require extensive F&A costs/activities (e.g., graduate student tuition, equipment, subaward amounts greater than \$25,000) compared to other direct costs (e.g., salaries, benefits, supplies).

Chart 9 on the following page illustrates typical direct cost items in a research budget and the application of the F&A rate. The F&A Amount (column 4) is determined by multiplying the negotiated F&A Rate (column 3) by the Direct Amount (column 2) for cost categories included in MTDC.

CHART 9: Research Budget

Cost Item	Direct Amount	F&A Rate	F&A Amount	Total Reimbursed
Salaries and Benefits (MTDC)	200,000	54%	108,000	308,000
Supplies (MTDC)	30,000	54%	16,200	46,200
Grad Student Tuition	25,000	n/a	0	25,000
Equipment	75,000	n/a	0	75,000
TOTAL	<u>330,000</u>		<u>124,200</u>	<u>454,200</u>
<i>(Percent of Total Reimbursed)</i>	<i>72.7%</i>		<i>27.3%</i>	<i>100%</i>

The “Percent of Total Reimbursed” at the bottom of Chart 9 is of particular interest: The 54% F&A rate applied in the example results in F&A costs of only 27.3% of the total research budget. National Institutes of Health data show that F&A costs as a percent of total awards has remained steady at less than 28% over the past decade (see **Chart 10** below).

CHART 10: NIH Direct and F&A Awarded (Dollars and Percent)

Fiscal Year	Direct Awarded (000s)	F&A Awarded (000s)	Total Awarded (000s)	Direct as a Percent of Total	F&A as a Percent of Total
FY2002	12,822,068	4,835,456	17,657,524	72.6	27.4
FY2007	15,387,745	5,876,060	21,263,805	72.4	27.6
FY2012	15,978,032	6,182,900	22,160,932	72.1	27.9

Source: Department of Health and Human Services, National Institutes of Health, National Library of Medicine. “FY2014 Congressional Justification,” April 2013.

Cutting-edge science requires appropriate infrastructure and other support, and institutions incur such real expenses in facility operations and administrative activities when conducting research on behalf of the federal government and other sponsors. Fair and equitable reimbursement of those F&A costs has a significant impact on the financial health of research universities. The next section explores this dynamic and the university financial contribution to the research enterprise.

University Contribution to the Research Enterprise

Broad Trends

Universities contribute to both direct and indirect (F&A) costs of federally-sponsored research. The National Science Foundation's (NSF) annual Higher Education Research and Development (HERD) Survey shows the significant and increasing financial contributions made by all colleges and universities to the research enterprise over the past 65 years—shown as “Institutional Funds” in **Charts 11 and 12** below.

CHART 11: Research & Development (R&D) Expenditures (in millions of current dollars, not adjusted for inflation)

Fiscal Year	All R&D Expend.	Federal Govt	State and Local Govt	Private Industry	Institutional Funds	All Other Sources
1956	372	213	53	29	43	34
1966	1,715	1,261	156	42	148	108
1976	3,729	2,512	364	123	446	285
1986	10,928	6,712	915	700	1,869	732
1996	23,048	13,841	1,811	1,605	4,171	1,619
2006	47,760	30,033	3,016	2,428	9,062	3,221
2012*	65,775*	40,130*	3,704	3,282	13,674	4,984
2012†	63,375†	37,730†	3,704	3,282	13,674	4,984

CHART 12: Research & Development (R&D) Expenditures by Funding Source as a Percentage of All R&D Expenditures

Fiscal Year	All R&D Expend.	Federal Govt.	State and Local Govt	Private Industry	Institutional Funds	All Other Sources
1956	100%	57.3%	14.2%	7.8%	11.6%	9.1%
1966	100%	73.5%	9.1%	2.4%	8.6%	6.3%
1976	100%	67.4%	9.8%	3.3%	12.0%	7.6%
1986	100%	61.4%	8.4%	6.4%	17.1%	6.7%
1996	100%	60.1%	7.9%	7.0%	18.1%	7.0%
2006	100%	62.9%	6.3%	5.1%	19.0%	6.7%
2012*	100%	61.0%*	5.6%*	5.0%*	20.8%*	7.6%*
2012†	100%	59.5%†	5.8%†	5.2%†	21.6%†	7.9%†

* Includes \$2.4 billion in one-time supplemental funding appropriated under the American Recovery and Reinvestment Act of 2009 (ARRA).

† Excludes ARRA funding.

Note: As of 2010, the HERD Survey reports Nonprofit Organizations (e.g., American Heart Association) as a separate funding source category. For consistency in this presentation, Charts 11 and 12 include Nonprofit Organizations' expenditures (\$4,033 million) and corresponding percentages in the All Other Sources category.

Over the period from 1976 to 2012, the share of R&D expenditures assumed by colleges and universities has grown faster than any other category. Institutional Funds accounted for 21.6% of all R&D expenditures in 2012 (adjusting out the ARRA effect) as compared to 12.0% of all R&D expenditures in 1976—a growth factor of +80%. Private Industry experienced a similar growth factor (+58%) while all other sectors declined, including a significant drop in the Federal Government category (–12%). ***In fact, for the first time since the 1950s, the federal government contribution dipped below 60%.***

Despite the decline in total share over time, the federal government remains the predominant source of R&D expenditure and the source on which the U.S. research enterprise most depends. However, with new budgetary pressures spurred on by the federal budget sequestration in 2013 (which cut FY2013 research budgets significantly) and other strains on federal discretionary spending, future federal government contributions are uncertain. After substantial investments (particularly at NIH) in the late 1990s through the early 2000s, budgets have flattened, and despite promises made in the America COMPETES Act of 2007, anticipated increases at NSF and several other federal agencies have not been realized.

Rightsizing the University Contribution and the Subsidy

Institutional Funds exceeded \$13.7 billion (over 20% of all research expenditures) in FY2012—greater than State and Local Government, Private Industry, and All Other Sources combined (see Charts 11 and 12). Research universities are enthusiastic contributors to the research enterprise and recognize this commitment as an important institutional role. However, a breakdown of the \$13.7 billion in FY2012 Institutional Funds contributed to research expenditures points to a concerning, and growing, weakness in the system:

Of the \$13.7 billion, 56% (\$7.7 billion) was in the form of direct funding for faculty or student research projects, 9% (\$1.3 billion) was devoted to cost sharing, and almost 34% (\$4.6 billion) represented unrecovered indirect costs. (2012 HERD Survey)

The HERD Survey data does not delineate unrecovered indirect costs between federal and non-federal sources. However, the proportion of federal funding compared to all other sponsored funding sources suggests that the majority of unrecovered F&A is attributable to federal programs.

What is the Right Size?

*While appropriate contribution levels to the research enterprise across funding sources is debatable, there is widespread concern as to the sustainability of the significant investments made by research universities. **The \$4.6 billion of unrecovered F&A costs in FY2012 equates to a staggering multi-million dollar obligation per university.***

When F&A costs are not reimbursed, research universities are left with a deficit that must be funded from other resources, which may force them to:

- Decrease institutional expenditures designated for instruction, public service, or student aid.
- Delay investments in maintaining and improving the facilities, equipment, and other infrastructure necessary for carrying out the institution's missions, including research.

In its 2012 report, *Diminishing Funding and Rising Expectations: Trends and Challenges for Public Research Universities*, the National Science Board notes that spending on physical plant operations and maintenance at public universities declined on a per-student basis by 5% between 2008 and 2009 after prior steady increases since 1999. The report suggests that “[d]eferred spending on maintenance potentially could lead to greater spending in the long-term, lowering an institution’s credit rating, and higher interest rate on debt” (p. 18). In this way, among others, unrecovered F&A is a financial burden with severe implications for the future productivity of research universities.

Chart 13 on the next page presents a case study using an income statement for a private research university in the southeast region of the United States.

CHART 13: An Income Statement for Research

Income Statement				
Private Research University, Southeast, USA				
Fiscal Year Ending June 30, 2013				
(in 000s)				
Revenue and Reimbursement:				
Direct Costs of Research	(1)	\$300,000		
F&A Costs of Research	(2)	<u>\$ 90,000</u>	\$390,000	77%
Expenses and Investments:				
Direct Costs of Research	(1)	\$300,000		
F&A Costs of Research	(2)	\$140,000		
Administrative Cap	(3)	\$ 10,000		
University-Funded Research		\$ 33,000		
Cost Sharing		<u>\$ 22,000</u>	<u>\$505,000</u>	100%
University Contribution	(4)		<u>\$115,000</u>	<u>23%</u>
Notes				
(1) Reimbursement from sponsors for direct costs incurred (\$300,000).				
(2) Partial reimbursement of F&A costs (\$90,000) versus F&A costs incurred (\$140,000) results in an involuntary subsidy of \$50,000.				
(3) Federal reimbursement of administrative costs is capped at 26%, resulting in an involuntary subsidy of \$10,000. <i>Note:</i> The NSF HERD Survey does not capture this variable; actual institutional administrative costs over the cap are calculated by a separate internal analysis.				
(4) University Contribution includes university-funded research (\$33,000) and cost sharing (\$22,000) investments, plus involuntary subsidies for unrecovered F&A (\$50,000) and unrecovered administrative costs over the cap (\$10,000).				
Observations				
<ul style="list-style-type: none"> • Combined expenditures of \$505 million represent the total research investment from all sources (federal sponsors, non-federal sponsors, and the University). • <i>Revenue and Reimbursement</i> from external sources (federal and non-federal sponsors) of \$390 million represents 77% of total expenditures. • <i>University Contribution</i> of \$115 million, or 23% of the university's research program, is supported by institutional funds. This is in line with the aggregate number reported in the 2012 HERD Survey (21.6%). • Of the \$115 million contribution, \$33 million is <i>University-Funded Research</i>, or research and development projects initiated and funded by the institution. This funding is often seed money for investigators to conduct precursor studies for competitive grant proposals and to provide opportunities to stimulate the development of new ideas. \$22 million is for <i>Cost Sharing</i> that has been committed by the university to supplement funding on federally-funded projects. The remaining \$60 million represents involuntary subsidies (see note (4) above), which creates an inequitable financial burden for the institution. 				

Explaining the University Subsidy

Some factors that contribute to the university subsidy include:

Agency and Statutory Restrictions. Federal agencies establish F&A caps for certain classes of programs (e.g., NIH “K series” career development awards, Department of Education training grants) and specific programs (e.g., NSF I-Corp program), often with no apparent justification. Agencies may also insist that specific transactions (e.g., purchases from vendors) are ineligible for F&A reimbursement even though federal rules permit it. Statutory limitations also are applied to some funding, as is the case with the F&A limitation on National Institute of Food and Agriculture awards and the salary limitation on awards made by Public Health Service agencies, including NIH.

Cost Sharing. Institutions voluntarily provide significant amounts of direct costs necessary for research in the form of salaries, equipment, graduate student tuition, and other expenses. While these may represent voluntary contributions, they still add to the university subsidy.

The Rate Negotiation and OMB Rules. F&A rate determinations, at times, result in arbitrary reductions when federal negotiators find rates above a certain level unacceptable. Also, since F&A rates normally are negotiated to cover a period of two to four years, in those instances where new research buildings are anticipated within that time period, some federal negotiators are reluctant to increase rates prospectively. Other limitations are incorporated into OMB rules. For example, library expenses normally are required to be allocated on an antiquated full-time equivalent (FTE) student-to-faculty ratio, which results in an under-allocation to research.

Non-federal Sponsors and F&A Limitations. Many private foundations, nonprofits, and charitable organizations also place limitations on F&A reimbursement (e.g., 10% versus the applicable federally-negotiated rate); however, universities often accept these awards when such sponsors support specific research and service aims for which funding opportunities are very limited. Many times these awards fund new investigators to initiate research programs or established investigators to supplement their primary sources of funding. Additionally, these awards often will reimburse as direct costs certain items considered F&A costs under federal rules. For this reason, and given that nonprofit organizations accounted for only approximately 6% of total FY2012 R&D expenditures (see Charts 11 and 12), unrecovered F&A costs from these sponsors do not contribute materially to the university subsidy.

Under-recovery that is driven by the policies of non-federal sponsors that do not honor full negotiated F&A rates has a limited impact compared with F&A under-recovery from federal sponsors. Nonetheless, university financial administrators grapple with the issue because, in the end, the institution is made the sole subsidizer of research sponsored by these entities. To prevent inequity to federal sponsors when

non-federal sponsors impose limitations on F&A reimbursement, OMB rules require that a university calculate its F&A rate by allocating F&A costs across all research, not just federally-sponsored research. This results in a single research F&A rate, which represents the cost of conducting all sponsored research and ensures that the federal government does not subsidize the F&A costs for research sponsored by private foundations, nonprofits, and charitable organizations.

The 26% Administrative Cap and Research Compliance Costs. In 1990, a federal audit resulted in the identification of unallowable costs in one institution's F&A rate. Federal officials perceived the situation to be widespread and, as a result, imposed a 26% cap (via a 1991 revision of Circular A-21) on all universities' federal reimbursement of administrative costs. Universities across the country responded by utilizing advanced technology for additional accounting system controls to ensure proper exclusion of costs not allowable for federal reimbursement.

The capped rate was determined based on data representing average administrative costs at universities prior to 1991. Since then, numerous and complex compliance requirements have evolved, including but not limited to those related to human subjects protection, animal care and use, laboratory and hazardous waste safety, data security, conflict of interest, research misconduct, export controls, effort and financial reporting, and campus-wide education programs. Despite the significantly increased real administrative costs of conducting federally-funded research at universities, the administrative cap remains in effect at 26%.

The 26% Puzzle

Only universities are subject to the 26% administrative cap. Private industry, nonprofit research institutions, and other entities are not similarly restricted, and, in the case of private industry, a profit factor is an additional allowable cost. Studies have shown universities to be more efficient than both industrial and federal labs (RAND, 2000; see Part III below), and long-sighted university initiatives to improve efficiency have effectively lowered administrative costs. Nonetheless, a steady stream of additional federal compliance mandates continues to offset efficiency gains, and most research universities incur administrative costs at a rate above 26%. While unquestionably supporting a culture of compliance, universities pay a disproportionate share of the cost of compliance.

In summary, the university subsidy is a legitimate issue and one that must be addressed honestly and constructively by all stakeholders. The 26% administrative cap and sponsor policies and practices that limit F&A reimbursement force universities to fund real, unreimbursed costs through non-federal revenue sources and, therefore, to potentially reduce investments in core missions and infrastructure. Ultimately, this impairs a university's ability to strategically plan and invest in its future research enterprise.

Fortunately, many federal agencies provide for full payment of the research university's negotiated F&A rate and generally comply with a key principle defined by the Office of Management and Budget in the OMB Circulars—*that the cost principles are designed to provide that Federal awards bear their fair share of cost*. Still, unrecovered F&A at research universities remains a problem of serious concern. The best hope for addressing this problem, and the other challenges associated with the finances of research universities, is focus on the future of the federal government–university research partnership.

PART III. FUTURE OF THE GOVERNMENT-UNIVERSITY PARTNERSHIP

The federal government–university partnership in the U.S. research enterprise is predicated on both parties sharing in the costs of research. While the federal government role predominates, HERD Survey annual data (see previous section) demonstrate the significant financial contributions made by universities. Universities willingly accept the responsibility of these contributions to the research partnership, as evidenced by a number of standard practices:

- Senior management and Boards of Trustees make financial commitments to build state-of-the-art research laboratories and facilities knowing that future F&A reimbursement will not fully cover the cost of the facilities or their operation costs.
- Cost sharing in the form of salaries, equipment, graduate student tuition, and other research commitments is a standard contribution made by the university. Further, investigators dedicate a significant amount of time to their research endeavors, a portion of which is never charged to federal awards. This voluntary contribution of research effort is fully paid for by the university.
- University-funded research centers, start-up funds for new researchers, bridge funding to support researchers during periods when external funding has expired, and internal competitive awards made from institutional funds are a significant component of the university research mission.
- Research administrators diligently work to ensure compliance with an increasingly complex regulatory environment without the benefit of full F&A recovery.

While the appropriate university contribution to the research enterprise is fluid, there is cause for concern when the university share continues to grow in relation to the federal share. Unreimbursed F&A is a significant portion of the university contribution, resulting in an inequitable financial burden and moving universities closer to the tipping point.

The Tipping Point

A decline in the quality of research infrastructure and compliance oversight, a gradual degradation of laboratories and facilities, and ultimately, lost competitiveness as other countries increase the quality of their research enterprises and students and faculty look outside of the U.S. to learn and to conduct research.

In *Paying for University Research Facilities and Administration*, the RAND Corporation identified a study showing that the fraction of total research costs classified as F&A costs was 31% for universities, 33% for federal laboratories, and 36% for industrial laboratories (Goldman et al., 2000, pp. 28-29). Universities receive proportionately less in F&A reimbursements than private contractors and other research performers. With more efficient operations as compared to other research performers and under-recovery of actual F&A costs due to caps and restrictions, universities are not treated equitably by the federal government in how the costs of research are shared. This is in spite of widespread agreement that federally-funded research performed by universities is vitally important to affirm the United States' world leadership in science and technology and to sustain American competitiveness.

The National Academies: Research Universities and the Future of America

In *Research Universities and the Future of America* (2012), a 250-page report, the National Academies observed the following:

[Research universities] are, however, confronted by many pressures: the economic challenges faced by the nation and the states, the emergence of global competitors, changing demographics, and rapidly evolving technologies. Even as other nations around the world have emulated the United States in building research universities to drive economic growth, America's commitment to sustaining the research partnership that built a great industrial nation has weakened under these pressures. ... We can say without reservation that our research universities are, today, the best in the world and an important resource for our nation, yet at the same time, they are in grave danger of not only losing their place of global leadership but of serious erosion in quality due to critical trends in public support. (pp. 1, 5)

To address these and other observations of the report, the National Academies recommends the following in line with the analysis of research finances presented in this paper:

National Academies – Recommendation 6: The federal government and other research sponsors should strive to cover the full costs of research projects and other activities they procure from research universities in a consistent and transparent manner.

National Academies – Recommendation 7: Reduce or eliminate regulations that increase administrative costs, impede research productivity, and deflect creative energy without substantially improving the research environment. (p. 15)

The federal government–university partnership is vital in achieving the recommendations made by the National Academies.

Concluding Thoughts

The economic downturn prompted by the bursting of the high-tech bubble in early 2000 created significant financial imbalances in higher education. States adjusted to the drop in tax revenues by cutting appropriations to public universities rather than reducing budgets for other state services such as Medicaid, prisons, and K-12 education. Private universities felt an impact through reduced private gifts and erosion in the value of endowments.

The economy recovered throughout the first half of the 2000s, and by 2007, some financial balance was restored at both public and private universities. However, any recoveries made quickly were reversed. The 2008 financial crisis, or “the Great Recession,” saw the bursting of the housing bubble, defaults on subprime mortgages, record-high energy prices, and a decline in the nation’s gross domestic product. While, appropriately, economic and social costs associated with housing foreclosures and unemployment were in the spotlight, the finances of higher education suffered along with all other sectors of the economy. State budgets and, consequently, state funding to public universities declined (again), and endowment values crashed, affecting both public and private institutions.

The American Recovery and Reinvestment Act of 2009 provided some relief to states in the form of financial assistance to supplement state operating budgets. States then used a portion of ARRA funds to augment state appropriations to public universities, though not to the extent where state appropriations equated levels from previous years. ARRA also provided directly to the research community over \$20 billion in research grants and contracts and related research facility construction funding. In crafting ARRA, federal policy makers recognized that investment in research is intricately tied to economic recovery. The resulting commitments of federal funds helped research universities stave off some of the pain of the financial crisis.

As the economy recovers, research universities confront a new reality: state appropriations may never return to their historic prominence, financial markets (and endowments) may always be subject to volatility, and using tuition increases as a mechanism to stabilize revenue streams may be forever politically untenable. At the same time, the cost of maintaining a state-of-the-art research infrastructure are not equitably supported given restrictions on federal reimbursement of these real costs.

Even direct funding of research by the federal government is uncertain. Research funding under ARRA has concluded, and budget sequestration in 2013 affected almost every federal agency and, by extension, every research university. Uncertain funding levels to be appropriated under future federal budgets is the new normal, and research universities have no choice but to plan accordingly.

These combined circumstances create unprecedented challenges in managing finances at research universities and are legitimate threats to the nation’s basic research capability. While research universities boast significant tangible and intangible assets, there still

exists a real and growing imbalance between available resources and the mandatory outlays of the nation's research universities. This issue must be addressed in the context of the historically productive federal government–university partnership; doing so provides the best chance of finding effective and constructive solutions.

Natalie Krawitz, Vice President, Finance and Administration, University of Missouri, and Yoke San Reynolds, Vice President and Chief Financial Officer, University of Virginia, were principal authors of the 2003 and 2008 versions of this paper. Both were members of the COGR Board and the COGR Costing Policies Committee until retiring from their respective institutions. The COGR Costing Policies Committee and volunteers from the COGR membership, listed on the following page, assumed responsibility for this 2014 version.

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