



AAMC

Tomorrow's Doctors, Tomorrow's Cures®

**ACADEMIC MEDICINE INVESTMENT  
IN MEDICAL RESEARCH: TECHNICAL REPORT**



Learn

Serve

Lead

---

This is a publication of the Association of American Medical Colleges. The AAMC serves and leads the academic medicine community to improve the health of all. [www.aamc.org](http://www.aamc.org).

Questions about the contents of this publication may be directed to Alexander Ommaya, D.Sc., Senior Director, Clinical Effectiveness and Implementation Research, Association of American Medical Colleges ([akommaya@aamc.org](mailto:akommaya@aamc.org)).

Huron Consulting Group assisted the AAMC in designing the survey instrument and analyzing the final results of this report.

© 2015 Association of American Medical Colleges. May not be reproduced or distributed without prior written permission. To request permission, please visit [www.aamc.org/91514/reproductions.html](http://www.aamc.org/91514/reproductions.html).

## Contents

<b>Executive Summary .....</b>	<b>4</b>
<b>Methodology.....</b>	<b>5</b>
<b>Results.....</b>	<b>6</b>
Table 1: Institutional F&A Investment .....	6
Table 2: Institutional Salary Expenditures.....	7
Figure 1: Bivariate Analysis—Institutional Total Investment versus Sponsored Programs Total Cost.....	8
<b>Conclusion .....</b>	<b>9</b>
<b>Additional Metrics and Graphs.....</b>	<b>9</b>
Figure 2: Sponsored Programs Expense by Sponsor Type .....	9
Table 3: Sponsored Programs Mean Expense .....	10
Figure 3: Sponsored Programs Total Direct Cost .....	11
Figure 4: Total Institutional Investment.....	11
Figure 5: Mandatory/Voluntary Committed Cost-Sharing Percentage of Total Institutional Investment.....	12
Figure 6: Over-the-Salary-Cap Cost-Sharing Percentage of Total Institutional Investment.....	12
Figure 7: University-Research Percentage of Total Institutional Investment.....	13
Figure 8: Start-Up–Funding Percentage of Total Institutional Investment.....	13
Figure 9: Bridge-Funding Percentage of Total Institutional Investment .....	14
Figure 10: Cost-Overrun Percentage of Total Institutional Investment.....	14
Figure 11: Additional-Research-Salary Percentage of Total Institutional Investment.....	15
Figure 12: Other-Institutional-Research Percentage of Total Institutional Investment.....	15
Figure 13: Unrecovered Organized Research and Other Sponsored Activities	
F&A Subsidies Percentage of Total Institutional Investment .....	16
Figure 14: Departmental-Research F&A Expenditures Percentage of Total Institutional Investment.....	16
Figure 15: Institutional-Research Expenditures by Category.....	17
Figure 16: Institutional Research as a Percentage of Sponsored Programs Expense .....	18
Figure 17: Institutional-Research Percentage of Total Research .....	18
Figure 18: NIH Effective F&A Recovery Rate .....	19
Figure 19: Other Federal Effective F&A Recovery Rate .....	19
Figure 20: State and Local Government Effective F&A Recovery Rate .....	20
Figure 21: Industrial/Corporate Effective F&A Recovery Rate .....	20
Figure 22: Foundation/Not-for-Profit Effective F&A Recovery Rate .....	21
Figure 23: Subaward and Subcontract Effective F&A Recovery Rate .....	21
Figure 24: Other-Sponsor Effective F&A Recovery Rate.....	22
Figure 25: Overall Effective F&A Recovery Rate .....	22
<b>Definitions.....</b>	<b>23</b>

## Executive Summary

Medical research has improved the health of Americans, fueled the economy, and spurred innovation. Such advances have been possible because of investments by federal, state, and local government, industry, foundations, and academic institutions. More than half of National Institutes of Health (NIH) extramural funding—roughly \$13 billion in FY 2014—supports researchers in the nation’s medical schools and teaching hospitals.

Academic medical centers are committed to preserving the tripartite missions of academic medicine: education, patient care, and research. The flow of revenue and funds for these three enterprises is unique to individual institutions. Data from FY 2013 indicate that grants and contracts account for 26% of the total revenue that supports medical school programs and activities.<sup>1</sup> This proportion is second only to revenue received from clinical operations.<sup>2</sup> To cover both direct and indirect costs, academic medical centers must subsidize these funds with their own investment. The full extent of this investment has not been well characterized—until now.

To measure the comprehensive investment of academic medicine in research, the Association of American Medical Colleges (AAMC) partnered with business office and research leaders at U.S. medical schools and engaged Huron Consulting Group (Huron) to develop a survey tool that allows consistent reporting of the investment in medical research across medical schools. The survey tool provides (1) a measure of the overall institutional investment for every extramural dollar received for research and (2) the distribution of institutional investment across subcategories.

Forty-six institutions collaborated with the AAMC and Huron on this effort. These institutions each received between \$26 million and \$751 million in external funding (total direct costs, or TDC) for medical research in 2013. The average medical school investment was an additional \$0.53 for each dollar of sponsored research received. This accounted for an average investment of \$111 million per medical school.

<sup>1</sup> LCME Part I-A Annual Medical School Financial Questionnaire (AFQ), FY2013. Prepared by the Association of American Medical Colleges, June 2014. [https://www.aamc.org/download/381714/data/fy2013\\_medical\\_school\\_financial\\_tables.pdf](https://www.aamc.org/download/381714/data/fy2013_medical_school_financial_tables.pdf). Accessed June 1, 2015.

<sup>2</sup> Association of American Medical Colleges. 2015. Academic Medicine Investment in Medical Research. Washington, DC. <https://members.aamc.org/eweb/upload/Academic%20Medicine%20Investment%20in%20Medical%20Research.pdf>. Accessed July 20, 2015.

This technical report presents data that supplement results summarized in the AAMC *Academic Medicine Investment in Medical Research* main report. The Results section here describes details relating to the metrics derived from the survey results, including results that are stratified by public and private institutions and by research intensity. The report also includes an Additional Metrics and Graphs section, with frequency charts showing distributions of the results from the survey, such as sponsored programs expense by sponsor type, institutional investment, and facilities and administrative (F&A) recovery rate by sponsor type.

### Methodology

On November 1, 2013, the AAMC convened a group of eight principal business officers and four deans of research from 12 accredited U.S. medical schools and representatives from Huron. This group designed the Investment in Research Survey Tool and developed definitions and instructions for the survey instrument. On April 2, 2014, the survey was distributed to a pilot group of 12 institutions represented by the people who were at the November meeting. Eleven institutions responded to the survey by June 26, 2014, and provided additional feedback about the survey instrument and definitions.

On August 1, 2014, the updated survey was distributed to 57 institutions (including the 12 pilot institutions). Responses were received from 46 institutions by November 1, 2014. The overall response rate for all participants was 81%. As survey responses were received, Huron contacted respondents to discuss data accuracy and methods of reporting. Eight institutions reported incomplete data because of limitations in data reporting from their financial systems. Therefore, the information from these institutions could not be included in the reported results.

Institutional-research expenditures were calculated by summing total direct costs of institution-funded research, unrecovered F&A subsidies related to organized research and other sponsored activities, and F&A subsidies related to the institutional subsidy of direct research expenditures.

## Results

The primary finding is that the average medical school investment applied to externally supported research programs was \$0.53 for each dollar of sponsored research received. This accounted for an average investment of \$111 million, with a 95% confidence interval between \$90 million and \$132 million per medical school.

More than half of the investment, \$0.27 for every dollar of sponsored research expended at a medical school, is related to F&A costs of the institution not reimbursed by sponsors (Table 1). Overall, the largest institutional expenditures were incurred to cover unreimbursed F&A costs, with an average of \$0.15 going to support unreimbursed indirect costs from extramural funds and \$0.12 going to support F&A costs associated with intramural funds provided by the institution. As indicated in [Figures 13 and 14](#) in the Additional Metrics and Graphs section, there was a mean of 31% (range from 2% to 63%) for the unreimbursed organized research and other sponsored activities (OR/OA) F&A subsidies portion of the total institutional investment, and a mean of 21% (range, 3% to 34%) for the departmental-research F&A expenditures portion of the total institutional investment.

Table 1. Institutional F&A Investment	Institutional Expenditures	
	Total Institutional F&A Expenditures	Total Institutional F&A Expenditures Expressed as Per Dollar of Sponsored Programs Dollars Received
<b>Average</b>	<b>\$56,060,001</b>	<b>\$0.27</b>
95% Confidence Interval	± \$10,440,571	± \$0.04
Sample Size	38	38

A large portion of the investment, \$0.21 for every dollar of sponsored research expended at a medical school, is related to salary costs (Table 2). Additional salary support of the research effort, which is salary that is charged to discretionary-type funding (and not charged to sponsored funds or other specified institutional funding mechanisms), was the largest component of this portion of the investment, averaging \$0.09, or 15% of the total institutional investment. As indicated in [Figure 11](#), additional salary support of the research effort had a mean of 15%, with values ranging from 0% to 37% of the total institutional investment.

Start-up funding and bridge funding, which traditionally consist predominantly of salary costs, averaged 9% and 4%, respectively (Figures [8](#) and [9](#)). Mandatory/voluntary committed and over-the-salary-cap cost sharing each averaged 5% (Figures [5](#) and [6](#)). Although the mean for over-the-salary-cap cost sharing was 5% of the total institutional investment, one institution reported over-the-salary-cap cost sharing at 30% of their institutional investment (Figure [6](#)). Federal funding made up 89% of this institution's sponsored-research portfolio, compared with a mean of 70%. Given that salary caps are generally imposed by federal sponsors, this may explain this institution's high salary-cap cost-sharing investment.

Components of the salary investment are comparable across public and private institutions and research intensity, with the largest variance seen in the additional salary support of the research-effort category (Figure [11](#)). For this component, public institutions averaged \$0.11, or 16% of the total investment, while private institutions averaged \$0.06, or 12% of the total investment. Institutions with less than \$150 million in sponsored-research total direct costs averaged \$0.13, or 19% of the total investment, while institutions with more than \$150 million in sponsored-research total direct costs averaged \$0.06, or 10% of the total investment (Figure [15](#)).

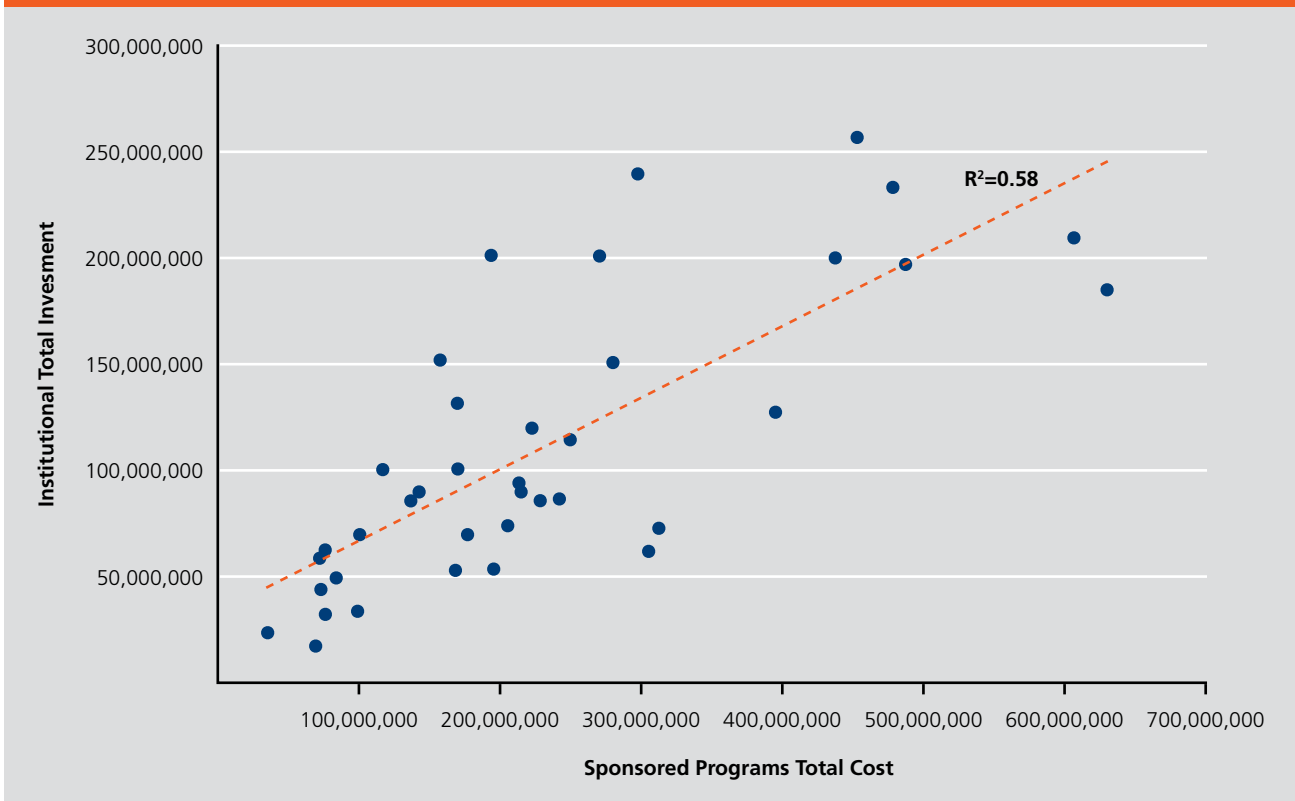
Table 2. Institutional Salary Expenditures*	Institutional Expenditures	
	Total Institutional Salary Expenditures	Total Institutional Salary Expenditures Expressed as Per Dollar of Sponsored Programs Dollars Received*
<b>Average</b>	<b>\$40,257,593</b>	<b>\$0.21</b>
95% Confidence Interval	± \$10,282,462	± \$0.04
Sample Size	30	30

\* Institutional salary expenditures consist of mandatory/voluntary committed cost sharing, over-the-salary-cap cost sharing, start-up funding, bridge funding, and additional salary support of the research effort.

Results were generally comparable for the remaining components of the investment. However, as indicated in [Figure 10](#), cost overruns at one institution made up 19% of its institutional investment—well above the mean of 2%. This institution separately budgets and accounts for cost overruns but does not track many of the other direct institutional investment categories reported in the survey. Therefore, the overall institutional investment may be understated, with cost overruns making up the majority of the direct institutional investment reported.

As Figure 1 indicates, there is a positive relationship between sponsored-research support and institutional investment. This means that as an institution incurs additional sponsored programs expense, additional institutional investment in the research enterprise is needed.

**Figure 1: Bivariate Analysis—Institutional Total Investment versus Sponsored Programs Total Cost**



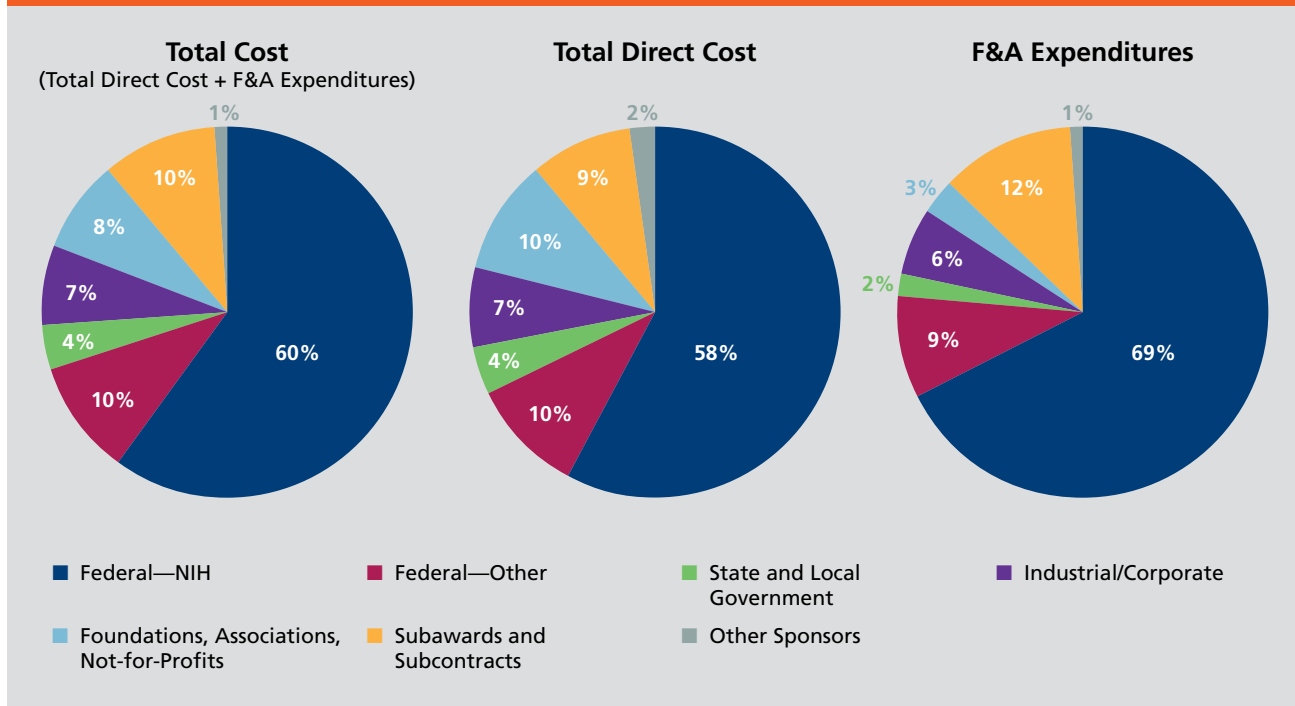


### Conclusion

There is a positive linear relationship between sponsored programs total cost and institutional total investment (Figure 1). Institutions with less than \$150 million in sponsored programs total direct costs spend a proportionally greater percentage of institutional-research expenditures on additional salary support than institutions with more than \$150 million in sponsored programs total direct costs (19% versus 10%). The other measured categories are generally comparable across public and private institutions and research intensity. For all survey respondents, the largest proportion of sponsored research is supported by NIH. NIH also provides the largest proportion of support for facilities and administrative (F&A) costs. These results indicate that medical schools make substantial investments in medical research, including unrecovered F&A costs related to sponsored programs, departmental-research F&A, salary support, and additional areas of support.

### Additional Metrics and Graphs

Figure 2: Sponsored Programs Expense by Sponsor Type

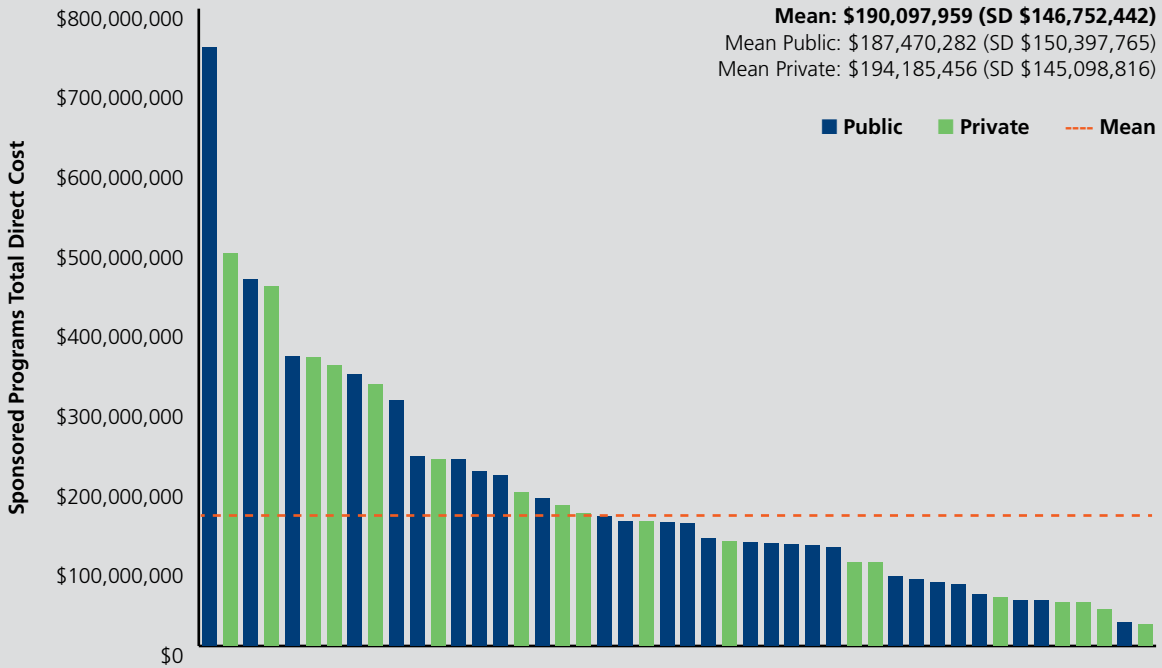


**Table 3: Sponsored Programs Mean Expense**

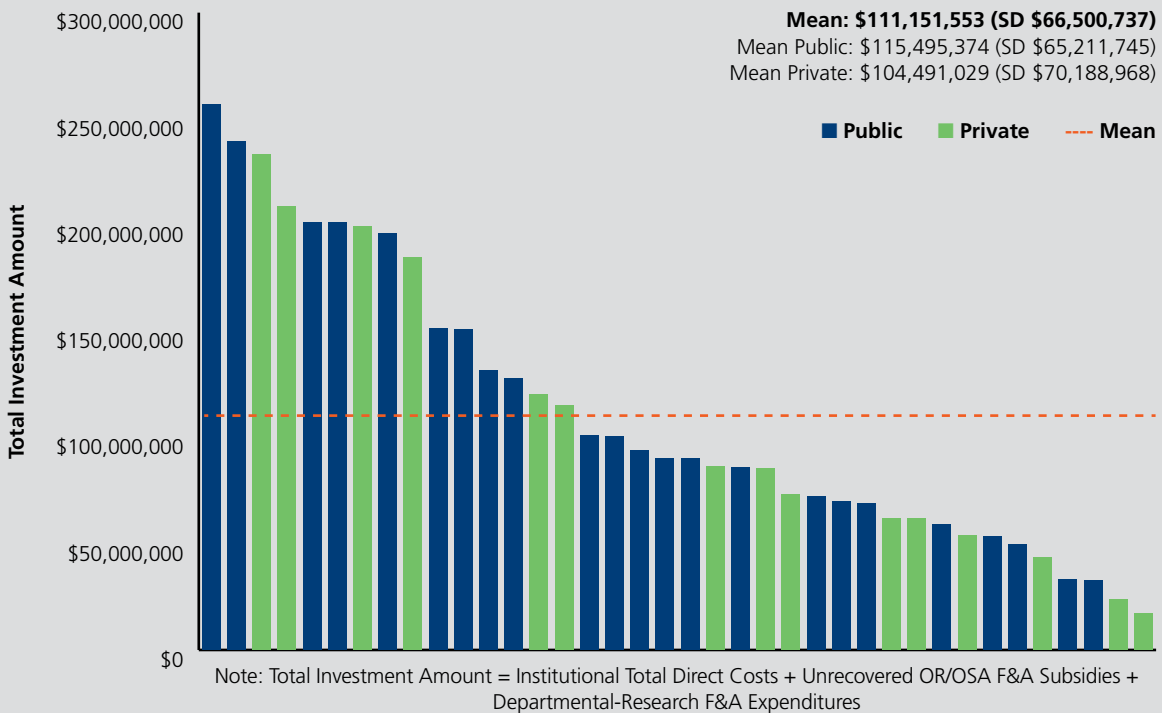
Total Cost (Total Direct Cost + F&A Expenditures)						
Sponsor Type	Institutions < \$150 Million Sponsored TDC		Institutions > \$150 Million Sponsored TDC		All Institutions	
	Mean	SD	Mean	SD	Mean	SD
NIH	\$69,046,642	\$38,769,163	\$224,912,972	\$107,019,904	\$146,979,807	\$111,990,466
Other Federal	12,176,792	9,558,089	31,280,337	33,060,627	21,728,565	25,907,514
State and Local Government	4,738,226	4,999,838	10,236,238	13,530,379	7,423,301	10,363,817
Industrial/Corporate	6,456,233	4,316,963	28,506,326	32,402,269	17,481,279	25,401,588
Foundation/Not-for-Profit	9,798,762	9,972,567	31,414,244	19,070,013	20,606,503	18,585,577
Subaward/Subcontracts	10,753,454	6,201,169	36,345,298	17,066,406	23,549,376	18,126,406
Other Sponsors	1,134,421	2,619,116	7,052,191	11,964,012	4,093,306	9,063,000
<b>Total Sponsored</b>	<b>\$112,061,974</b>	<b>\$48,971,782</b>	<b>\$362,422,634</b>	<b>\$183,463,467</b>	<b>\$240,024,089</b>	<b>\$184,370,209</b>
<b>Total Sample Size</b>	<b>22</b>	<b>22</b>	<b>23</b>	<b>23</b>	<b>45</b>	<b>45</b>
Total Direct Cost						
NIH	\$50,078,436	\$26,095,241	\$165,096,749	\$79,103,582	\$107,587,592	\$82,295,348
Other Federal	9,871,632	7,961,622	25,321,363	27,776,660	17,596,497	21,642,829
State and Local Government	4,159,788	4,567,577	8,984,035	11,562,916	6,515,816	8,947,189
Industrial/Corporate	5,159,791	3,652,285	22,833,992	28,764,381	13,996,891	22,128,773
Foundation/Not-for-Profit	9,209,487	9,878,395	28,869,499	17,520,154	19,039,493	17,210,158
Subaward/Subcontracts	7,992,554	4,709,609	26,248,003	12,458,314	17,120,279	13,110,269
Other Sponsors	954,776	2,118,271	5,707,971	10,033,724	3,331,373	7,558,974
<b>Total Sponsored</b>	<b>\$85,920,277</b>	<b>\$35,715,704</b>	<b>\$285,594,167</b>	<b>\$145,170,116</b>	<b>\$190,097,959</b>	<b>\$146,752,442</b>
<b>Total Sample Size</b>	<b>22</b>	<b>22</b>	<b>24</b>	<b>24</b>	<b>46</b>	<b>46</b>
F&A Expenditures						
NIH	\$18,968,206	\$13,562,866	\$59,816,223	\$28,610,148	\$39,392,214	\$30,271,021
Other Federal	2,305,160	1,887,660	5,958,974	5,486,581	4,132,067	4,454,363
State and Local Government	578,437	1,044,827	1,252,203	2,382,339	907,486	1,834,284
Industrial/Corporate	1,296,442	823,708	5,672,334	4,147,546	3,484,388	3,690,655
Foundation/Not-for-Profit	589,274	421,910	2,544,745	1,797,002	1,567,010	1,624,933
Subaward/Subcontracts	2,760,900	1,866,391	10,097,294	5,042,733	6,429,097	5,280,866
Other Sponsors	128,081	484,539	979,158	1,835,107	563,076	1,407,469
<b>Total Sponsored</b>	<b>\$26,141,696</b>	<b>\$15,686,269</b>	<b>\$84,429,554</b>	<b>\$41,728,402</b>	<b>\$55,933,268</b>	<b>\$43,084,921</b>
<b>Total Sample Size</b>	<b>22</b>	<b>22</b>	<b>23</b>	<b>23</b>	<b>45</b>	<b>45</b>

Note: Total sponsored expenditures may be different from the total of the expenditures per category because the sample size may be different between categories.

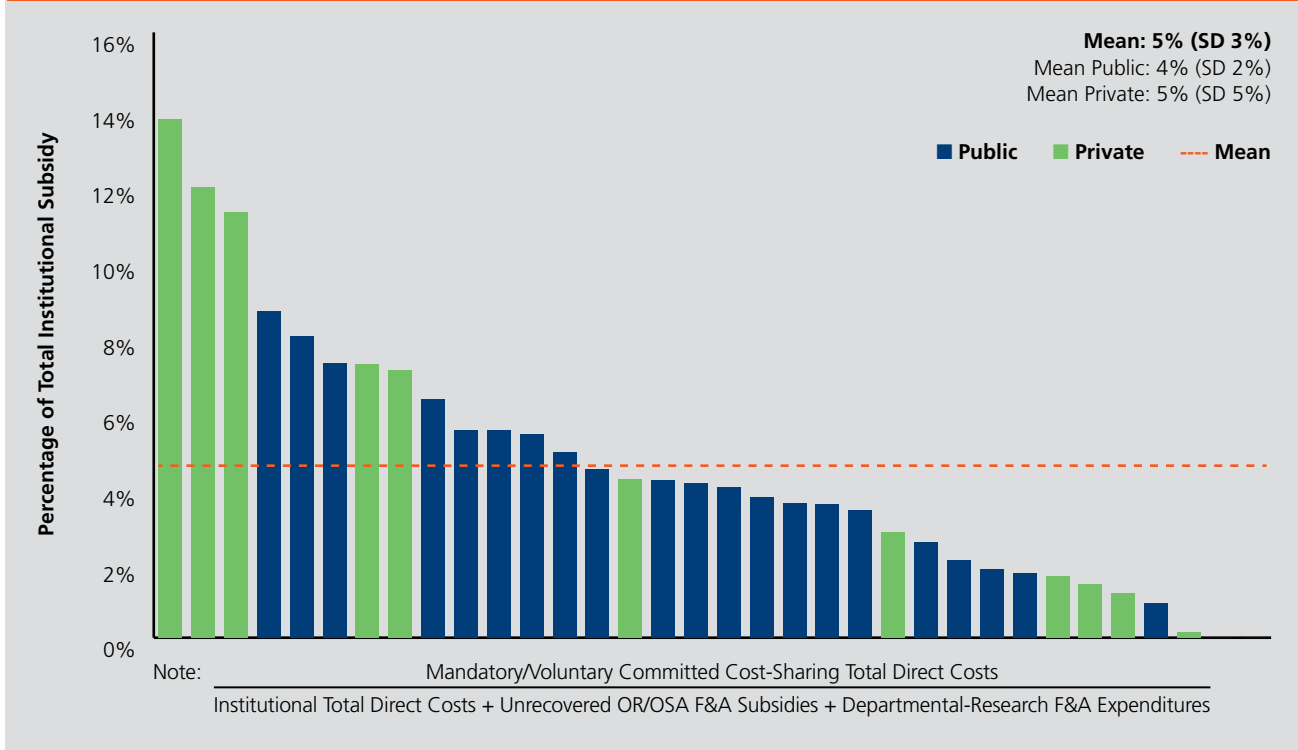
**Figure 3: Sponsored Programs Total Direct Cost**



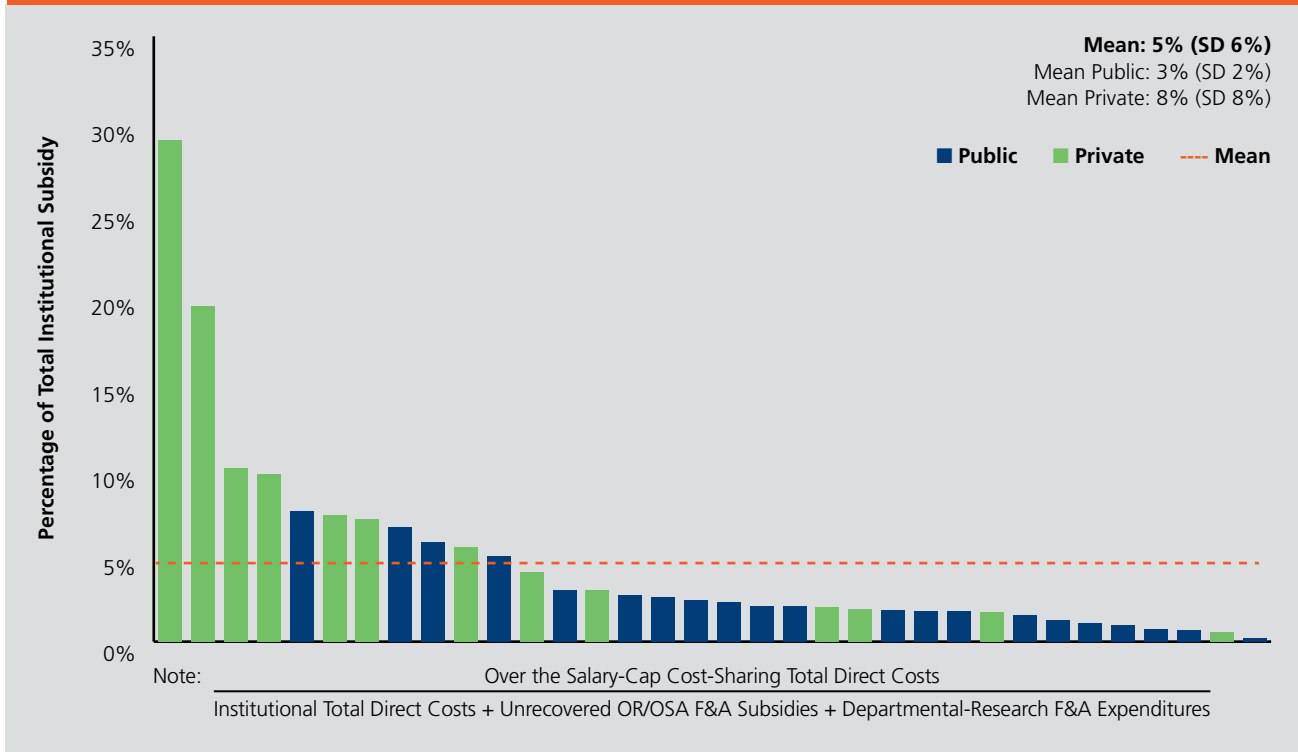
**Figure 4: Total Institutional Investment**



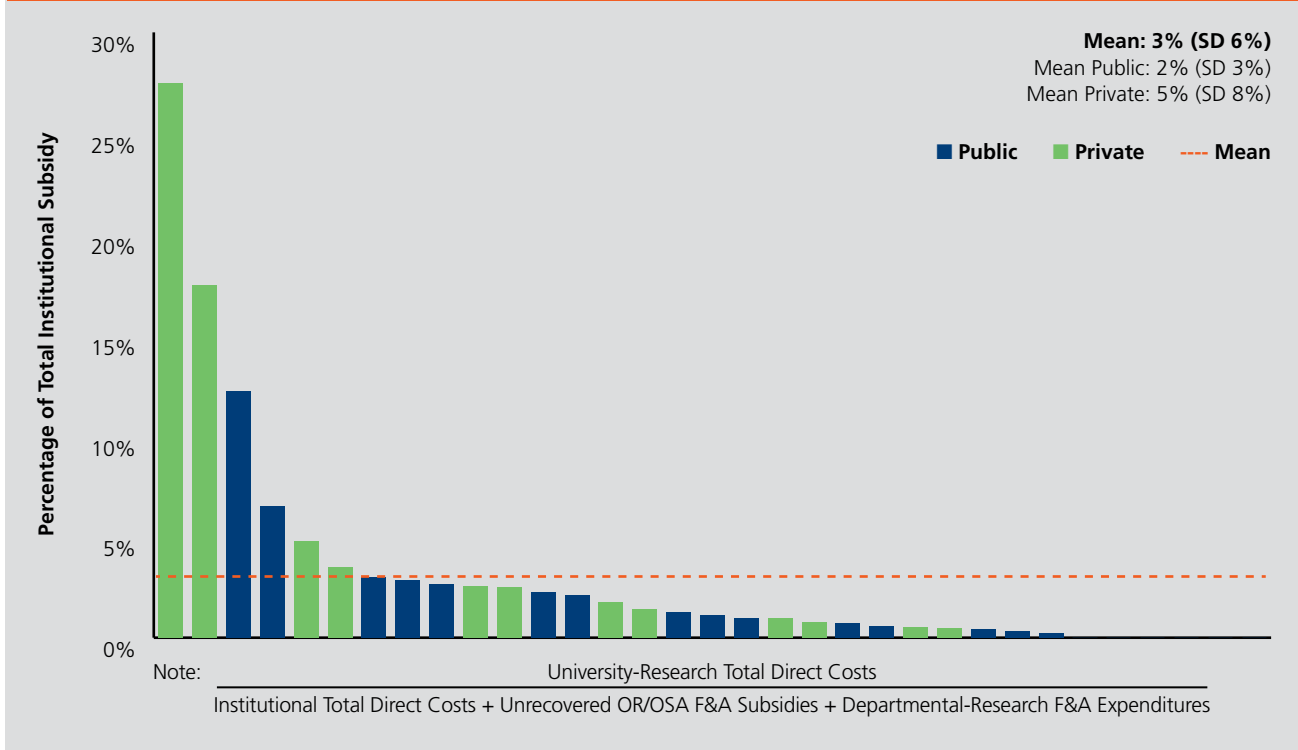
**Figure 5: Mandatory/Voluntary Committed Cost-Sharing Percentage of Total Institutional Investment**



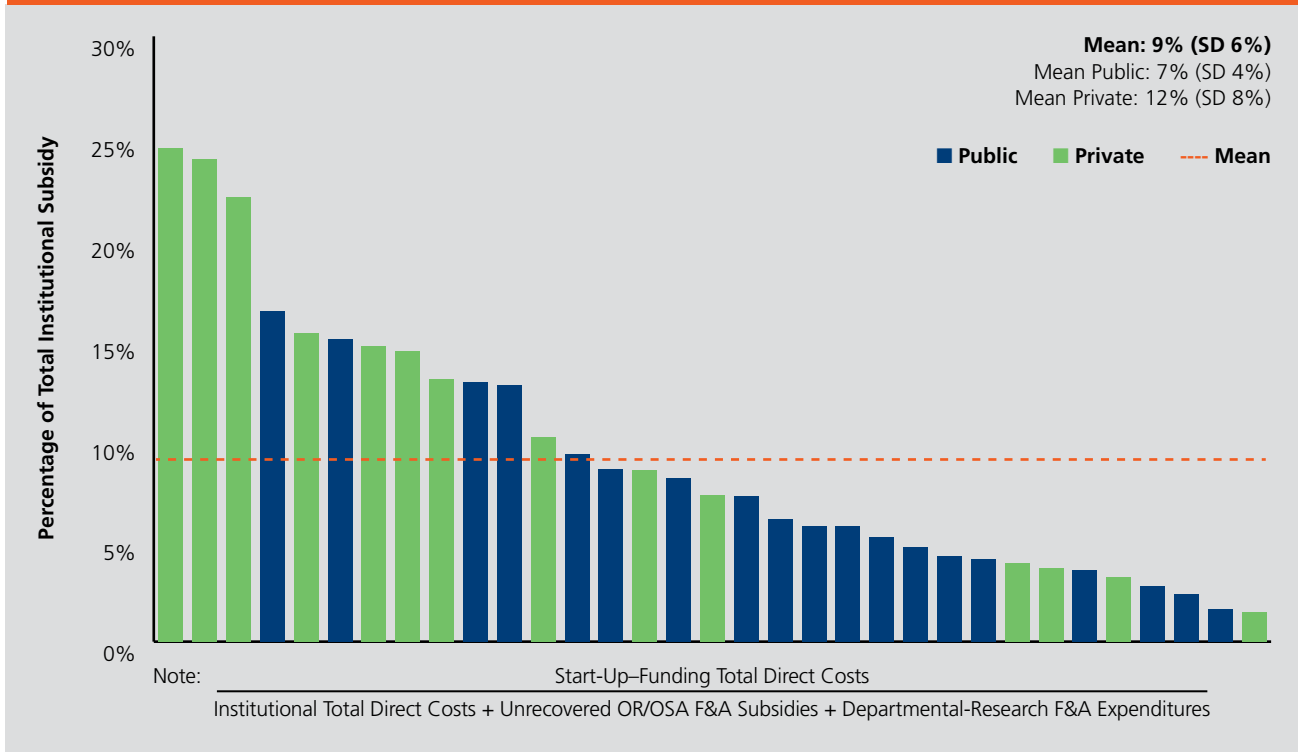
**Figure 6: Over-the-Salary-Cap Cost-Sharing Percentage of Total Institutional Investment**



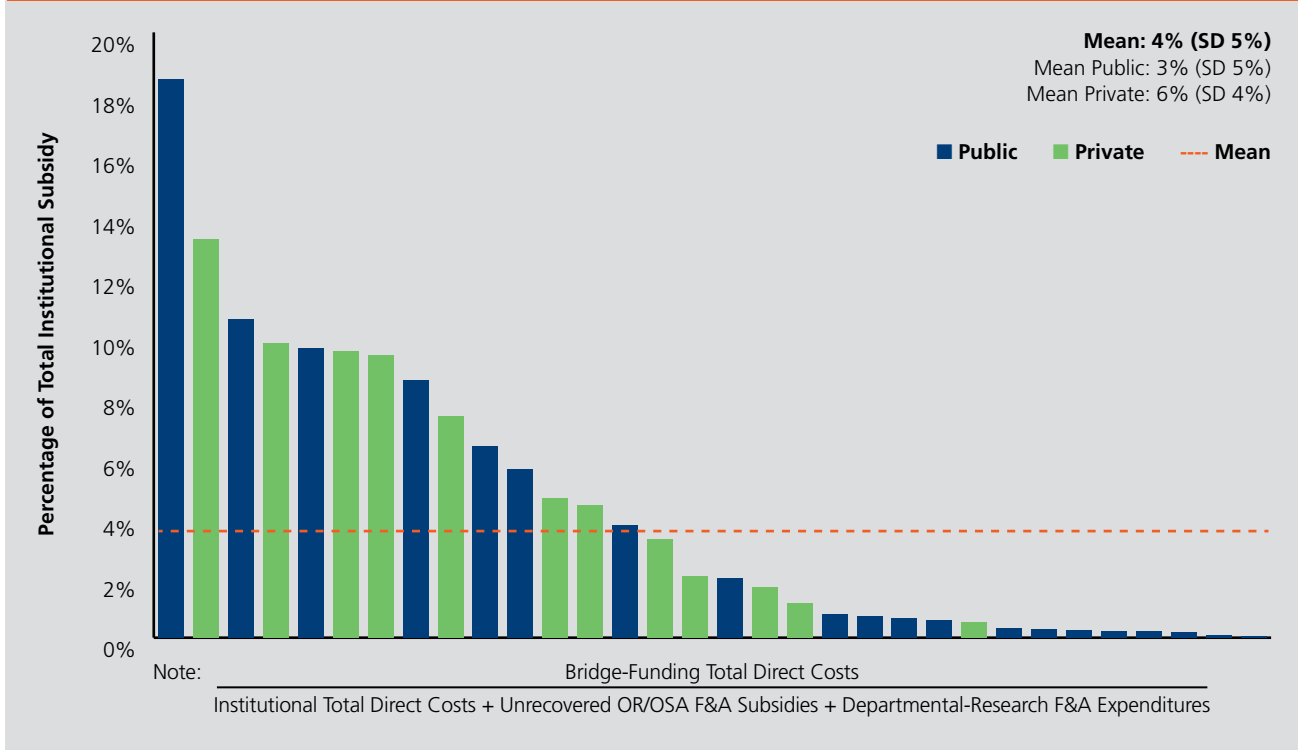
**Figure 7: University-Research Percentage of Total Institutional Investment**



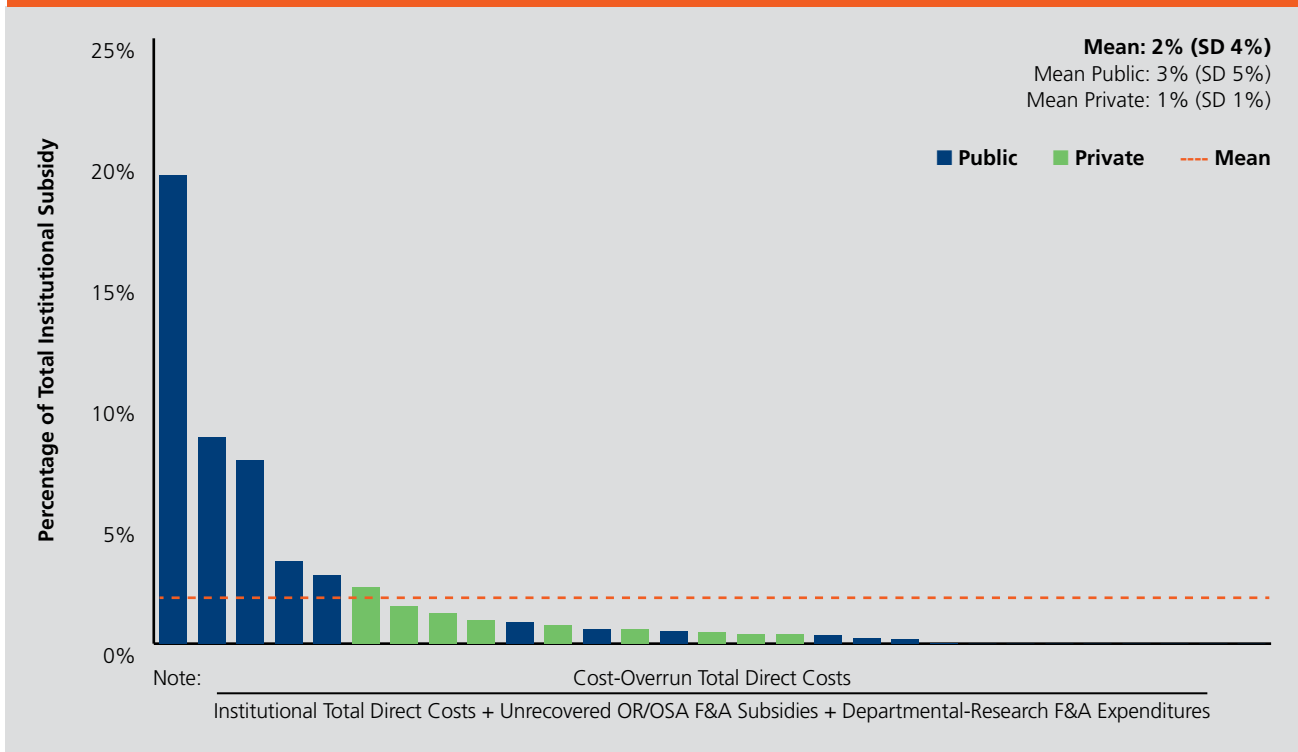
**Figure 8: Start-Up-Funding Percentage of Total Institutional Investment**



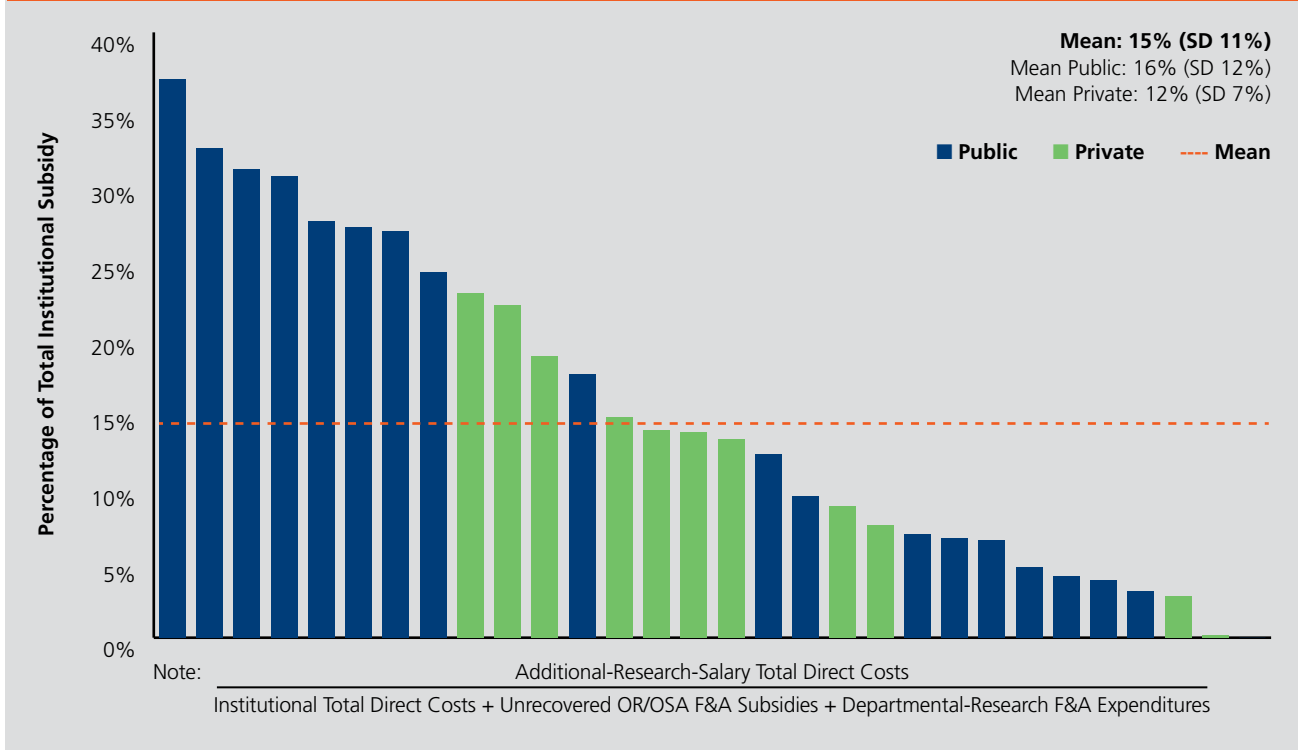
**Figure 9: Bridge-Funding Percentage of Total Institutional Investment**



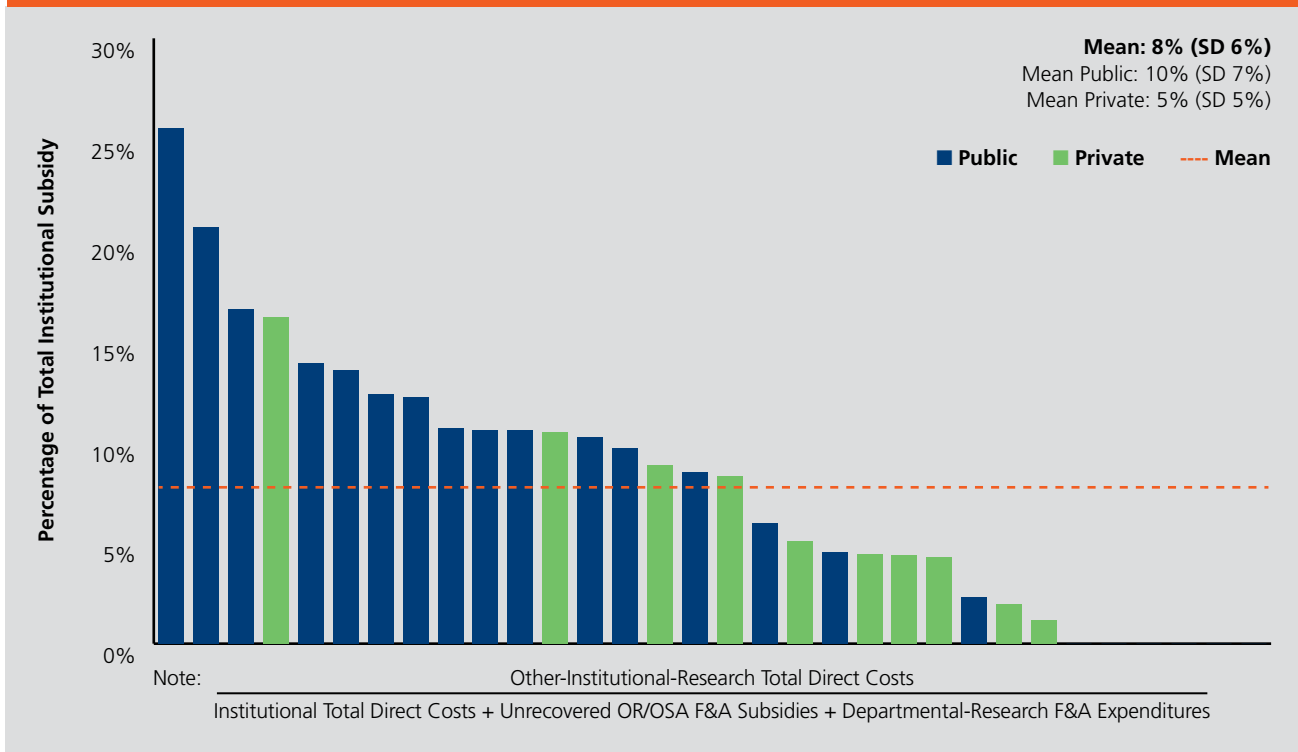
**Figure 10: Cost-Overrun Percentage of Total Institutional Investment**



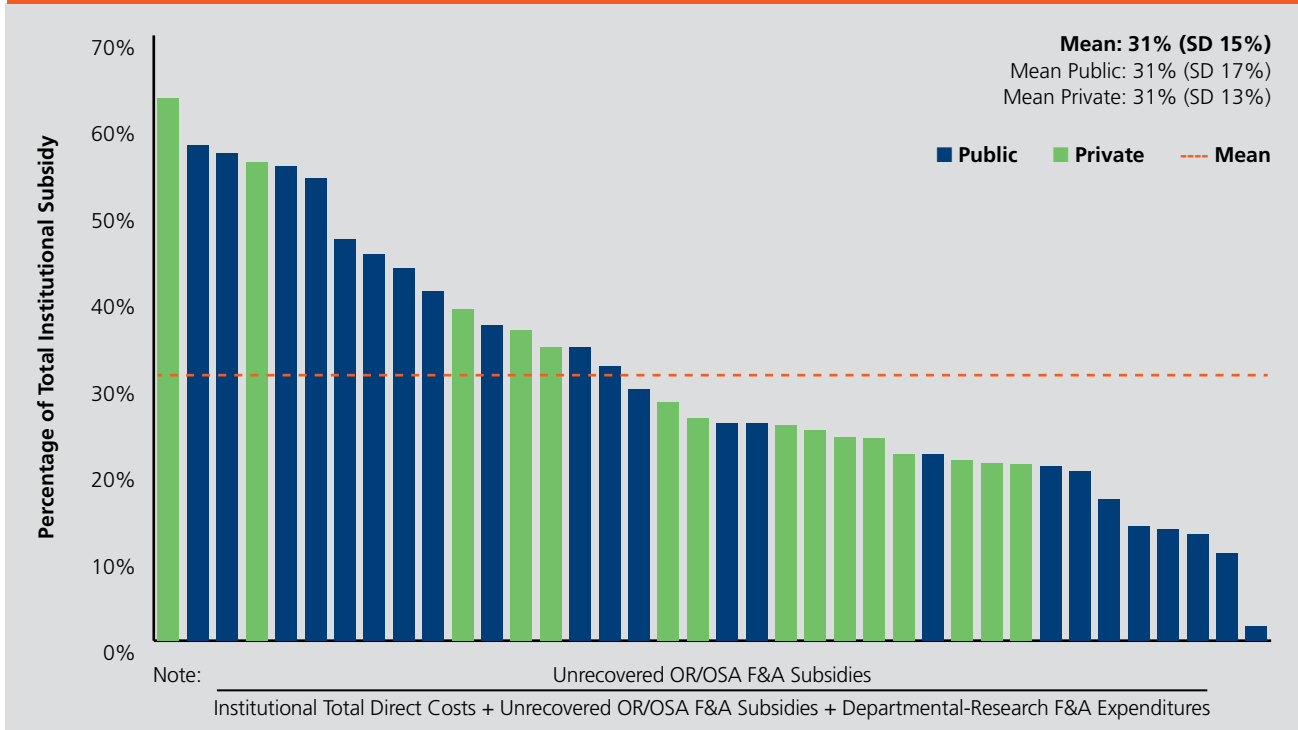
**Figure 11: Additional-Research-Salary Percentage of Total Institutional Investment**



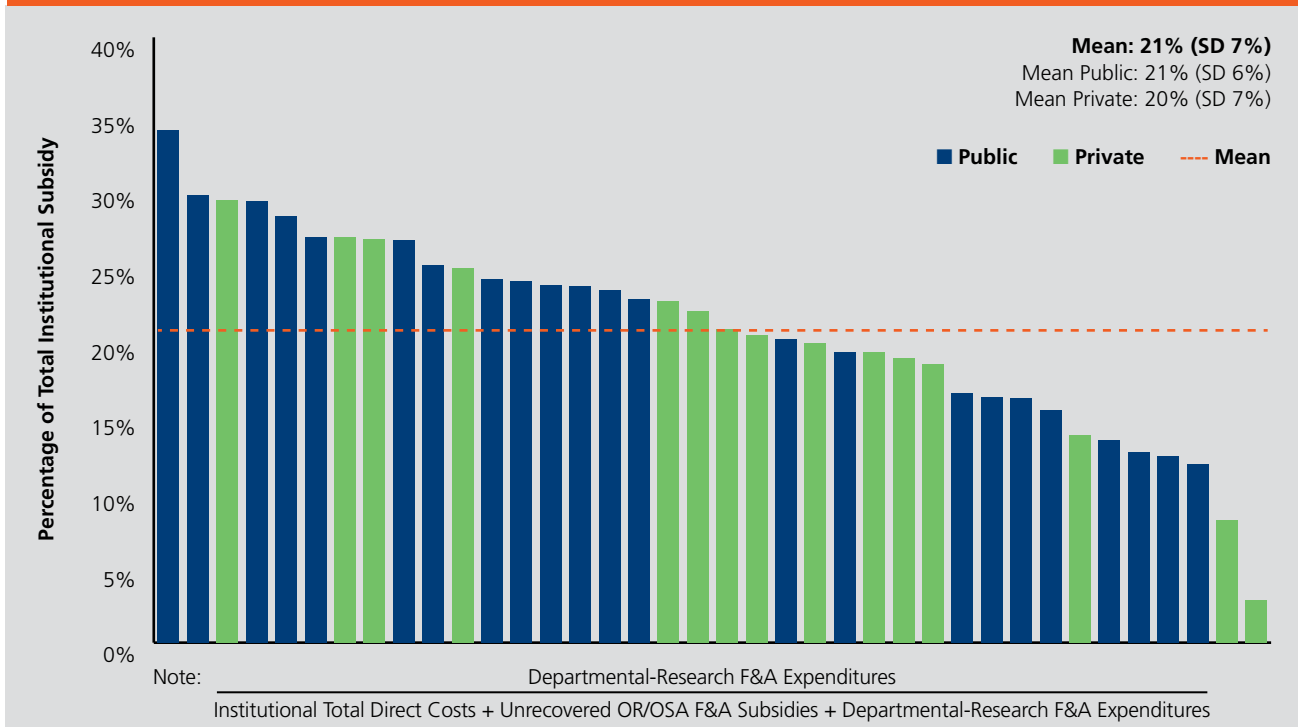
**Figure 12: Other-Institutional-Research Percentage of Total Institutional Investment**



**Figure 13: Unrecovered Organized Research and Other Sponsored Activities F&A Subsidies Percentage of Total Institutional Investment**



**Figure 14: Departmental-Research F&A Expenditures Percentage of Total Institutional Investment**

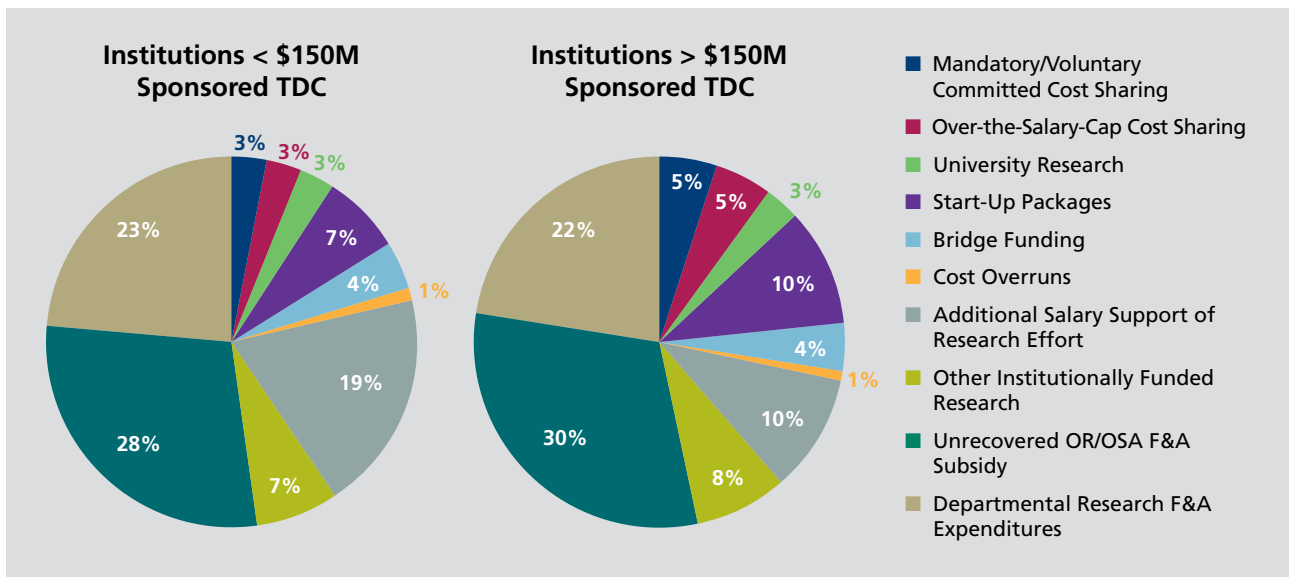




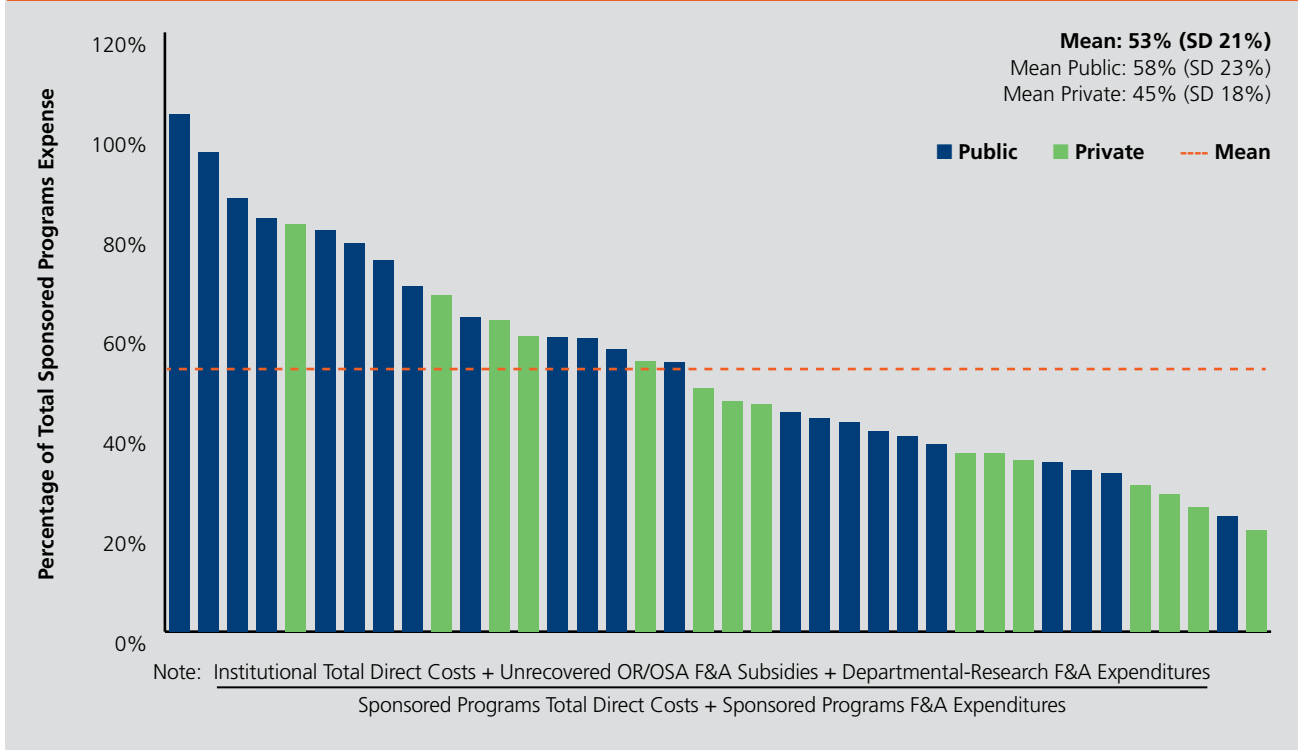
**Figure 15: Institutional-Research Expenditures by Category**

Institutional Expenditure Category	Institutions < \$150 Million Sponsored TDC		Institutions > \$150 Million Sponsored TDC		All Institutions	
	Mean	SD	Mean	SD	Mean	SD
Mandatory/Voluntary Committed Cost Sharing	\$2,231,102	\$1,839,489	\$7,147,669	\$6,282,805	\$4,878,484	\$5,334,309
Over-the-Salary-Cap Cost Sharing	1,913,608	1,529,504	7,733,679	6,449,711	5,114,647	5,658,415
University Research	2,210,684	5,391,777	4,251,558	7,710,615	3,258,701	6,672,655
Start-up Packages	4,965,460	4,676,897	14,660,198	13,491,399	9,681,819	11,000,981
Bridge Funding	2,803,434	4,246,547	5,137,115	6,031,706	4,001,811	5,301,388
Cost Overruns	907,487	1,838,641	1,763,152	3,252,890	1,410,819	2,758,029
Additional Salary Support of Research Effort	13,626,422	14,523,790	16,433,587	18,459,411	14,942,281	16,272,222
Other Institutionally Funded Research	5,095,569	5,745,026	11,249,160	9,394,742	8,079,128	8,223,663
Unrecovered OR/OSA F&A Subsidies	19,586,549	13,583,775	42,829,883	25,663,843	31,819,883	23,692,300
Departmental-Research F&A Expenditures	15,558,780	11,077,629	32,053,322	20,891,879	24,240,118	18,713,040
<b>Total Institutional Expenditures</b>	<b>\$69,237,092</b>	<b>\$36,171,992</b>	<b>\$148,874,569</b>	<b>\$65,413,880</b>	<b>\$111,151,553</b>	<b>\$66,500,737</b>
<b>Total Sample Size</b>	<b>18</b>	<b>18</b>	<b>20</b>	<b>20</b>	<b>38</b>	<b>38</b>

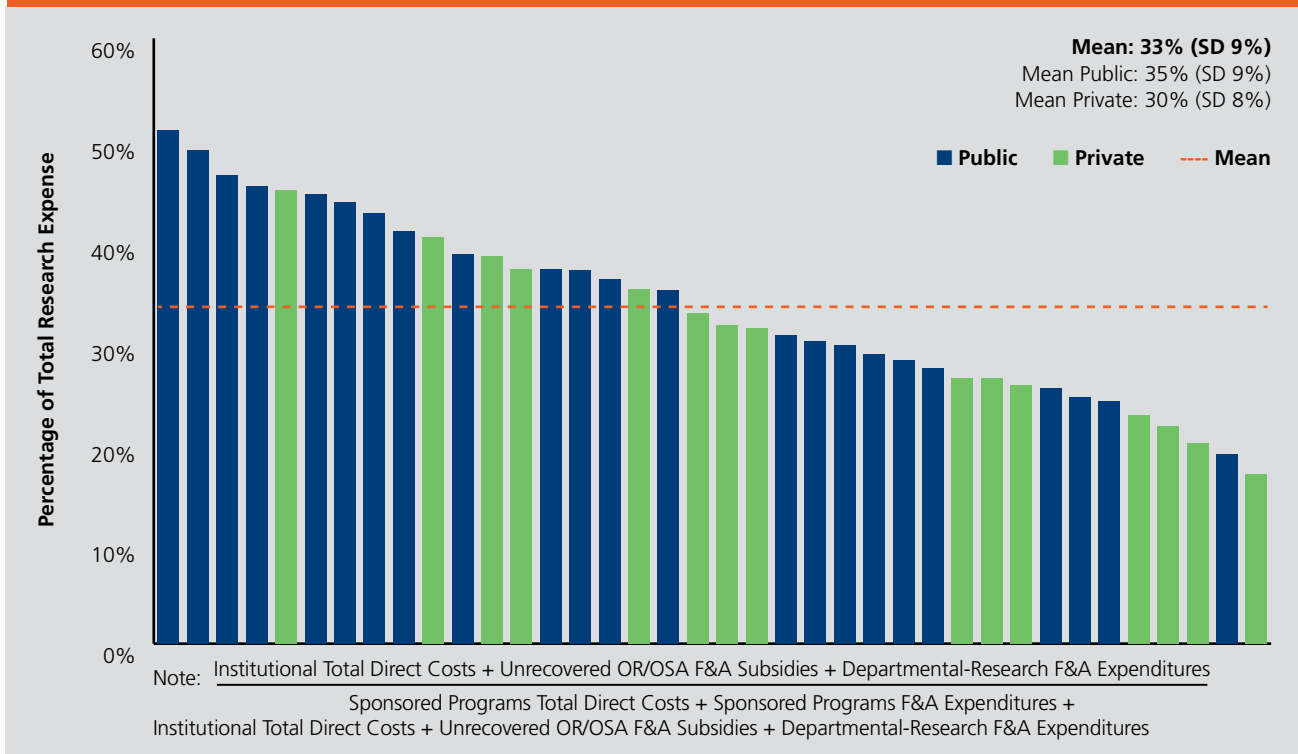
Note: Total institutional expenditures may be different from the total of the expenditures per category because the sample size may be different between categories.



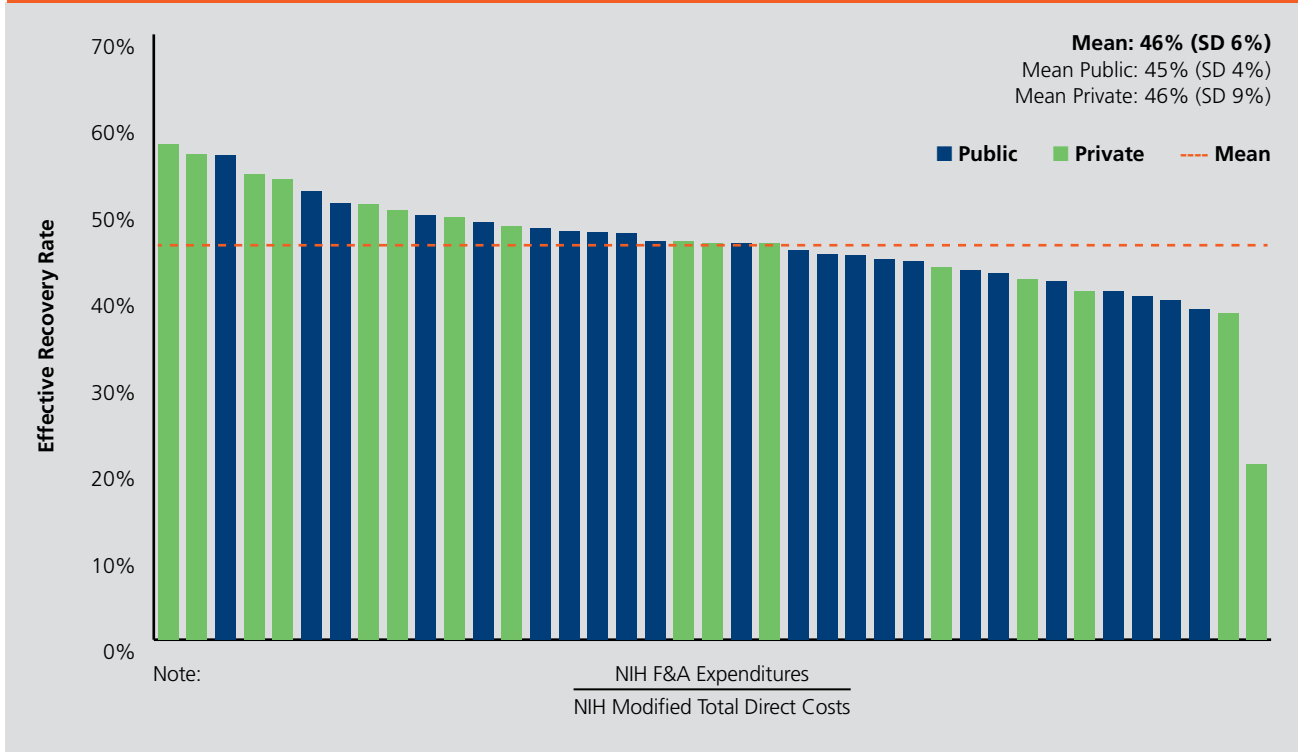
**Figure 16: Institutional Research as a Percentage of Sponsored Programs Expense**



**Figure 17: Institutional-Research Percentage of Total Research**



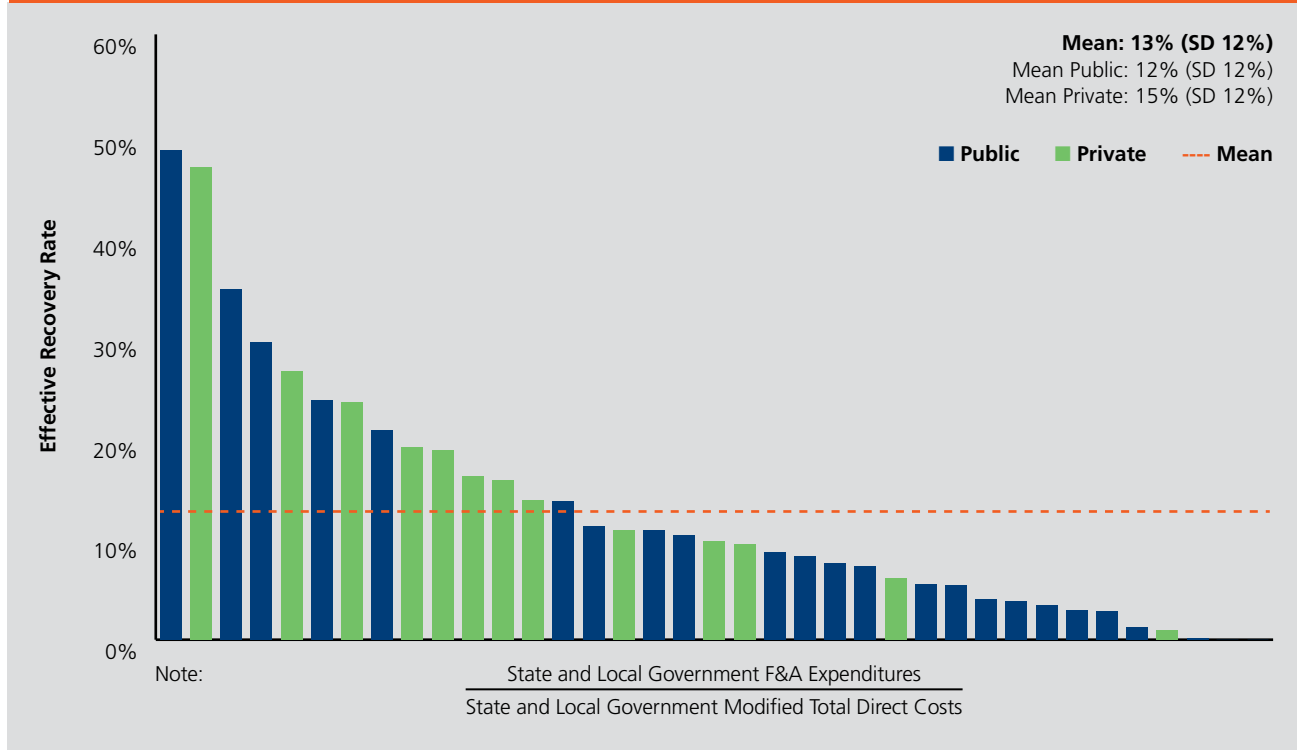
**Figure 18: NIH Effective F&A Recovery Rate**



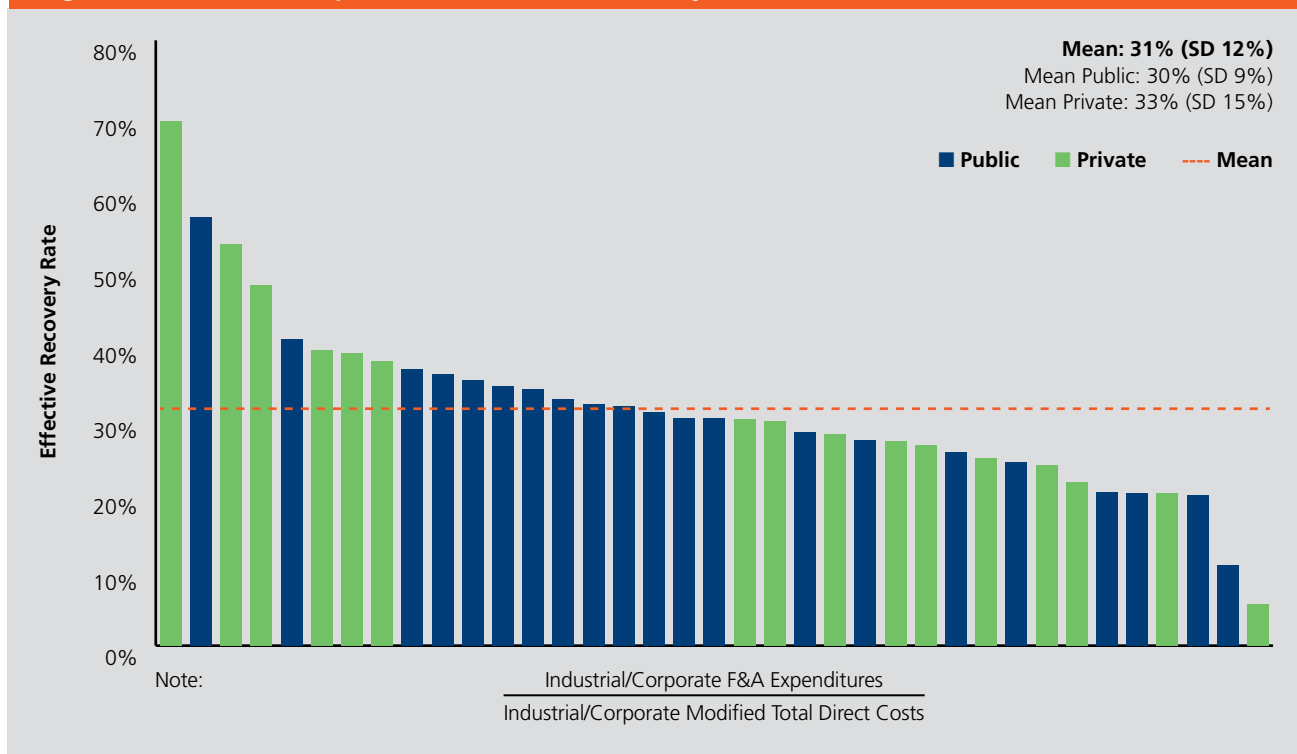
**Figure 19: Other Federal Effective F&A Recovery Rate**



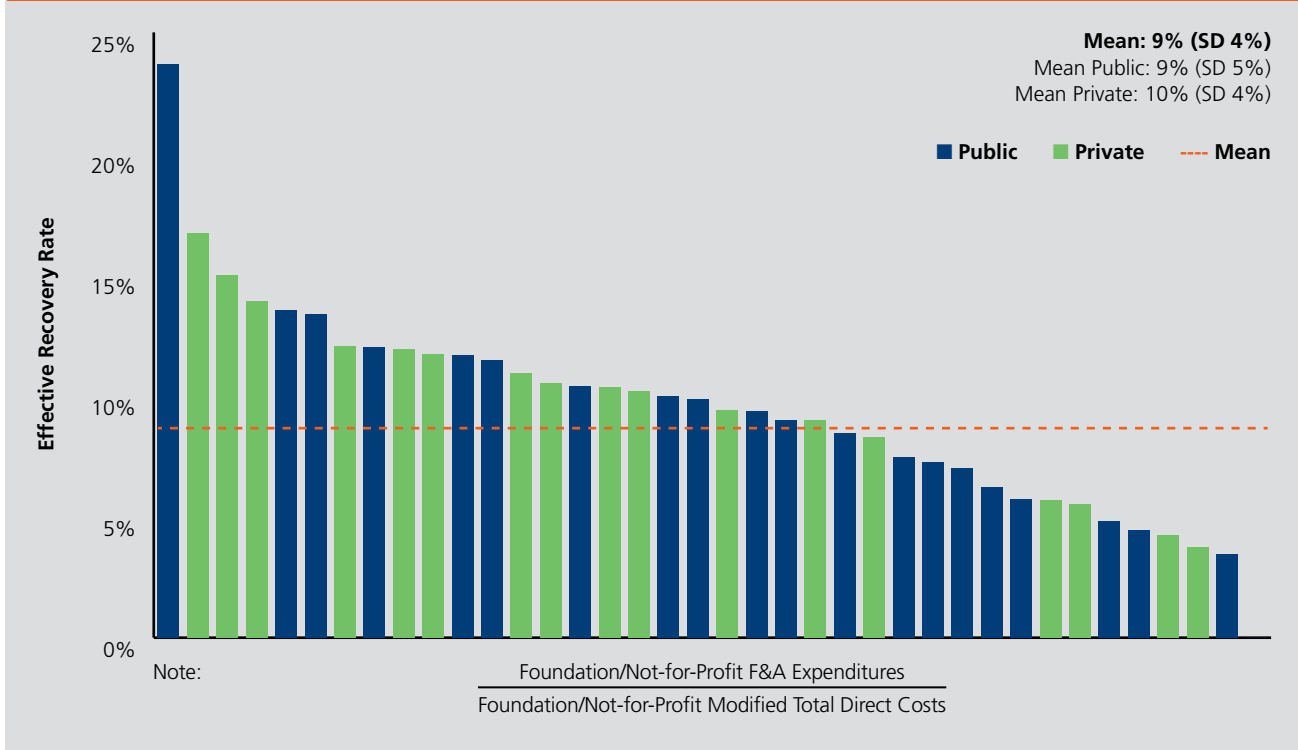
**Figure 20: State and Local Government Effective F&A Recovery Rate**



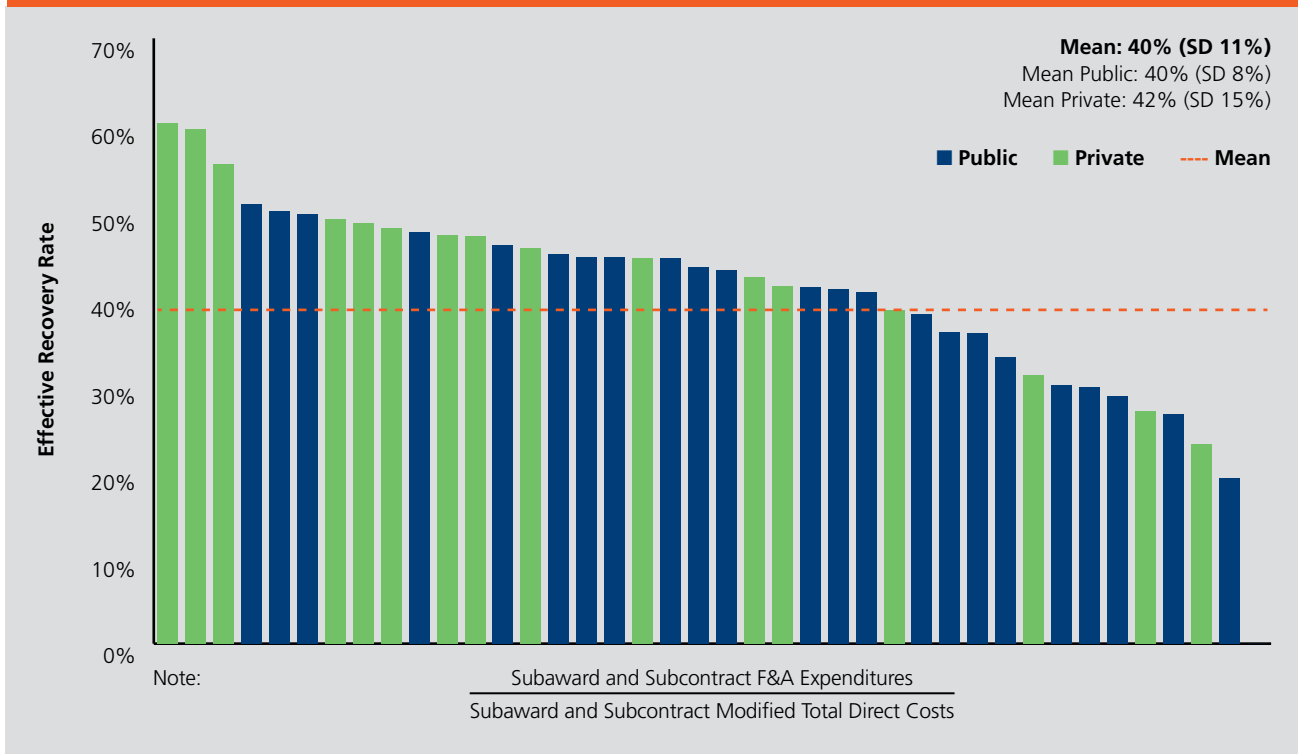
**Figure 21: Industrial/Corporate Effective F&A Recovery Rate**



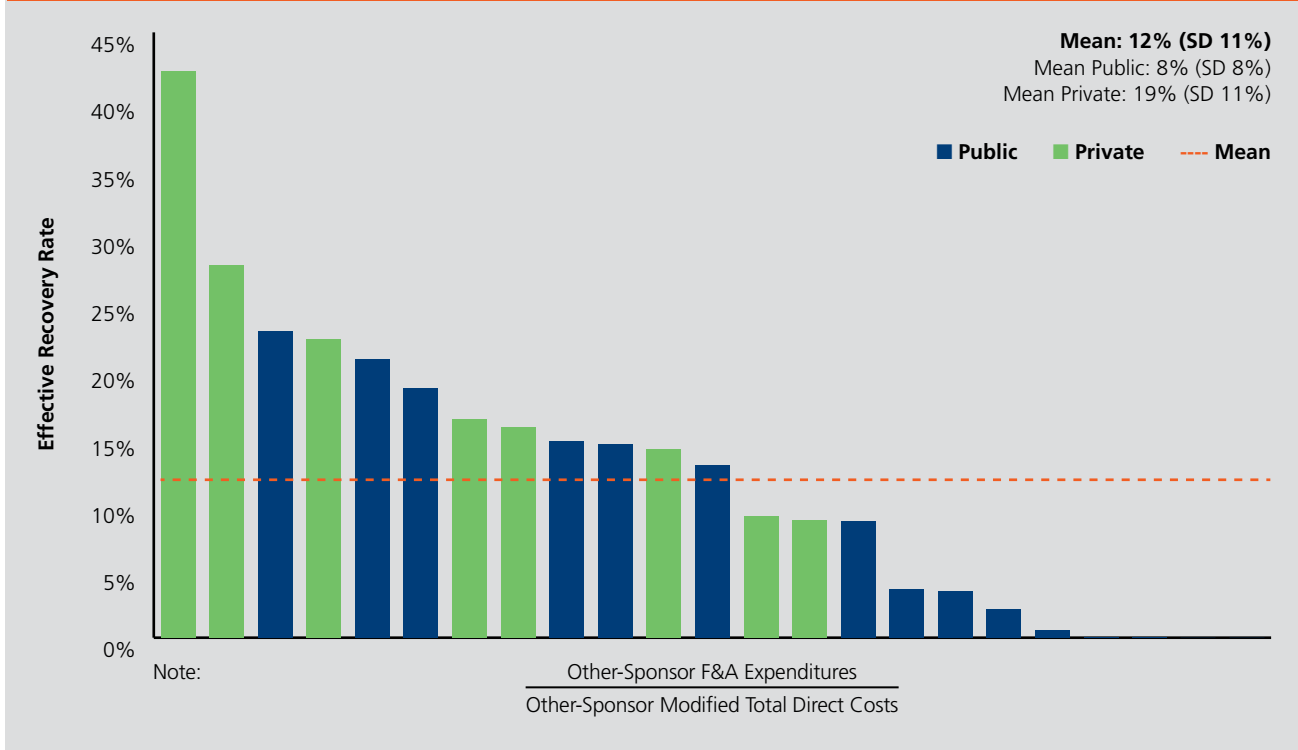
**Figure 22: Foundation/Not-for-Profit Effective F&A Recovery Rate**



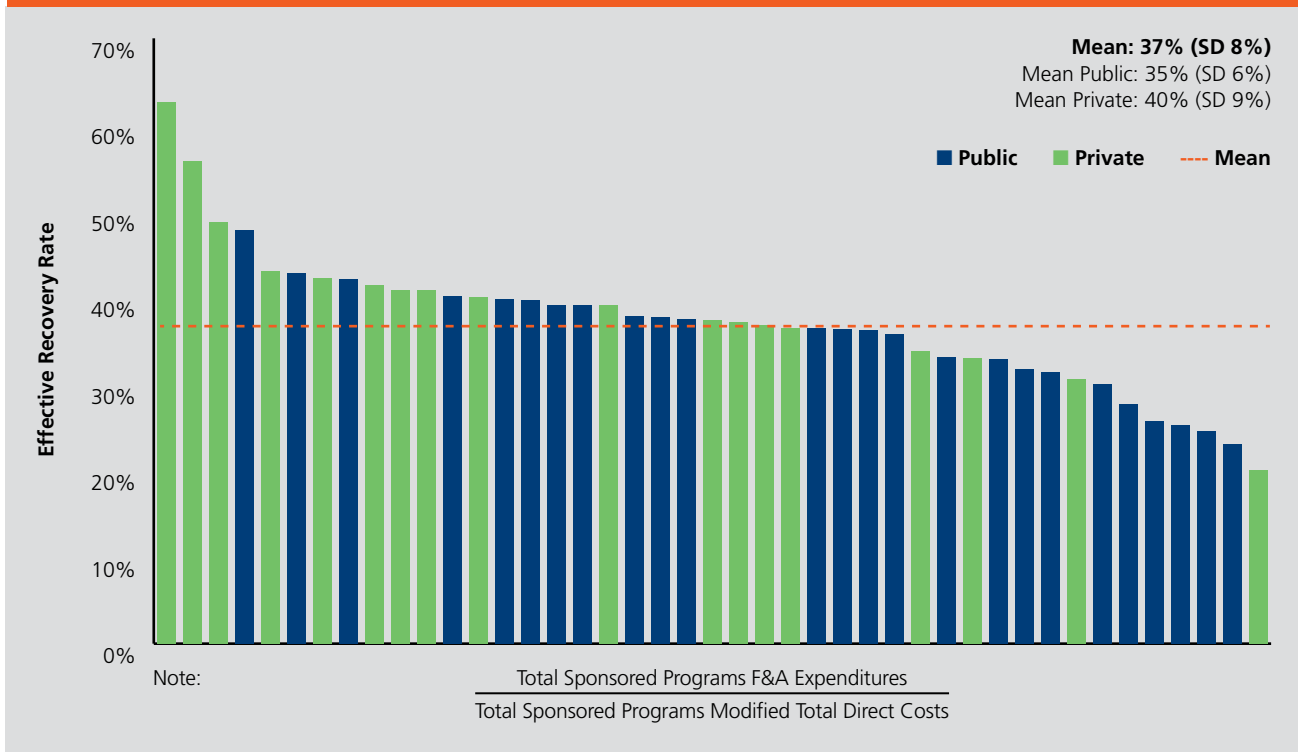
**Figure 23: Subaward and Subcontract Effective F&A Recovery Rate**



**Figure 24: Other-Sponsor Effective F&A Recovery Rate**



**Figure 25: Overall Effective F&A Recovery Rate**



**DEFINITIONS** **additional salary support of research effort.** Additional direct-cost salary expenditures from institutional accounts used in support of internally funded research efforts.

**bridge funding.** A structured form of research support, which could include a formalized application for these funds, a defined amount of support, and the timeframe over which the funds may be used. Bridge funding provides support for researchers who have promising lines of inquiry but due to the highly competitive nature of research funding, have temporarily lost support.

**cost sharing (mandatory and voluntary committed).** Direct-cost expenditures associated with cost sharing required by the terms of the project (mandatory) and cost sharing that is not required but is documented and quantified in the proposal and becomes mandatory when the proposal is accepted (voluntary committed).

**departmental-research F&A expenditures.** Facilities and administrative (F&A) expenditures related to the research classified as departmental research reported on the survey. These departmental-research expenditures include start-up packages, bridge funding, additional salary support for research effort, and other institutionally funded research.

**facilities and administrative (F&A), or indirect, costs.** Costs that are not directly related to an individual research project but are essential to support the research endeavor. These F&A charges include costs of buildings (operations, maintenance, and depreciation), equipment depreciation, information systems, environmental health and safety, and grant management and other support costs.

**institutional-research expenditures.** Calculated by adding institution-funded-research total direct cost (TDC), unrecovered F&A subsidies related to organized research and other sponsored activities, and additional F&A subsidies related to the institutional subsidy of direct research expenditures.

**organized research (OR).** All research and development activities of an institution that are separately budgeted and accounted for. Includes sponsored research, which is sponsored by federal and nonfederal agencies and organizations, as well as university research, which is separately budgeted and accounted for by the institution under an internal application of institutional funds.

**other institutionally funded research.** Institutional direct-cost research expenditures that have not been reported elsewhere on the survey. May include specialized service facility (SSF) and recharge-center subsidies, costs of operating core research facilities, and unreimbursed graduate student stipends or tuition payments.

**other sponsored activities (OSA).** Programs and projects financed by federal and nonfederal agencies and organizations that involve the performance of work other than instruction and organized research. Examples of such programs and projects are health service projects and community service programs.

**over-the-salary-cap cost share.** Direct-cost expenditures associated with cost sharing that occurred due to exceeding sponsor-imposed salary caps, such as the National Institutes of Health (NIH) salary cap, on all sponsored programs types.

**overruns.** Direct-cost expenditures from institutional accounts used to fund cost overruns on sponsored programs as a result of overspending on individual awards. They include expenditures where funds have been moved during the current year from a sponsored account to an institutionally funded account.

**sponsored programs expenditures.** Calculated by adding sponsored programs TDC and sponsored programs F&A expenditures.

**start-up packages.** Direct-cost expenditures from institutional funds associated with recruiting or attracting new researchers to the institution, including start-up costs.

**university research.** Direct-cost expenditures associated with activities that meet the Office of Management of Budget (OMB) uniform guidance definition of university research: all research and development activities that are separately budgeted and accounted for by the institution under an internal application of institutional funds. These funds are typically awarded through an internal proposal submission and evaluation process.

**unrecovered OR/OSA F&A subsidies.** The gap between the F&A expenditures in support of sponsored programs at an institution and the amount reimbursed by sponsors.