Annual Report on Research and Scholarship
FY2009 Financial Summary

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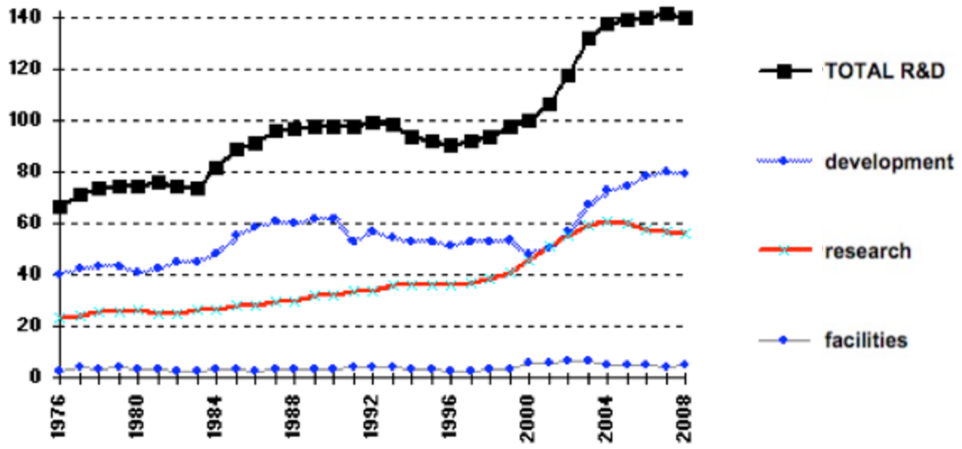
The University of Michigan expenditures in support of research, scholarship and creative activity reached a special milestone in Fiscal Year 2009 -- total expenditures for the year surpassed $1 billion, reaching $1,016,565,913 (see "A Very Loud Number," Appendix I). The total is an increase of 9.4% over FY2008. Overall, the University's research portfolio remains one of the largest in the country, consistently appearing in the top four university research programs according to R&D statistics tabulated by the National Science Foundation. The University's research expenditures growth trend for the last decade is summarized in Figure 1.

Figure 1: Research Expenditures by Major Sponsor Group, FY1999-2009



Total research expenditures have doubled during the decade, and resumed a healthy level of growth in the last two years after several years of small increases. This growth is occurring in spite of a decline in Federal funding trends, particularly for research. These trends are shown in Figure 2. (We note that due to "stimulus" spending on research, there should be an increase in Federal R&D for 2010 into 2011. The longer-term role of federal R&D support is less certain.)

Figure 2: Trends in Federal R&D, FY1976-2008



Source: AAAS

Just under one-third of the University's total non-hospital budget comes from research funding, including the federal government, industry, and foundations. Table 1 shows the total research expenditures divided into the three major sponsor groups of Federal, Nonfederal and University spending. Within the Nonfederal group, the Industry, Foundation and State of Michigan components are broken out.

Table 1: U-M Research Expenditures by Major Sponsor Group, FY2009

Sponsor Group	Expenditures	% of total
Total Federal Government	$654,918,596	64.4%
Total Non-Federal Sponsors	$111,988,922	11.0%
Industry (direct)	*$43,317,167*	*4.3%*
Foundations	*$23,857,411*	*2.3%*
State of Michigan/Counties/Cities	*$4,555,854*	*0.4%*
Total U-M Funds	$249,658,394	24.6%
Total Research Expenditures	$1,016,565,913	

Federal funding, which comprises just under two-thirds of the U-M's current research total, has long been the largest source of research support at the U-M. University internal funds allocated to research by schools and colleges, departments, and OVPR – an extremely important factor contributing to our success in obtaining external funding – accounted for one-quarter of the year's spending[1]. We note that the

[1] Beginning in FY2008, the University began including Medical School's Faculty Group Practice departmental research activity that operates in the Auxiliary Fund. The inclusion of this activity increased U-M's internal research expenditures by $53,250,834 in FY2008 and $44,205,667 in FY2009.

sponsored research funding was all obtained through competitive proposals submitted by our faculty, indicating that our long term investment in faculty recruitment is paying off at this critical time.

Table 2 provides additional detail about the sources of research funding for FY2008 and FY2009, including the year-to-year change in dollar amounts and percent. Additional details can be found in Appendix II.

Table 2: U-M Research Expenditures
Percent Change by Major Sponsor Group, FY2008-2009

Sponsor Group	FY08	% of total	FY09	% of total	$ Chg.	% Chg.
Total Federal	$611,370,548	65.8%	$654,918,596	64.4%	$43,548,049	7.1%
NIH	*$393,033,824*	*42.3%*	*$421,453,708*	*41.5%*	*$28,419,884*	*7.2%*
NSF	*$64,800,692*	*7.0%*	*$67,280,046*	*6.6%*	*$2,479,354*	*3.8%*
DOD	*$59,378,407*	*6.4%*	*$64,354,926*	*6.3%*	*$4,976,519*	*8.4%*
Energy	*$17,476,457*	*1.9%*	*$21,737,061*	*2.1%*	*$4,260,604*	*24.4%*
NASA	*$15,888,114*	*1.7%*	*$16,566,350*	*1.6%*	*$678,236*	*4.3%*
Transportation	*$14,803,527*	*1.6%*	*$13,129,204*	*1.3%*	*-$1,674,323*	*-11.3%*
Commerce	*$5,905,347*	*0.6%*	*$8,047,389*	*0.8%*	*$1,524,566*	*25.8%*
Total Non-Federal	$105,461,564	11.4%	$111,988,922	11.0%	$6,527,359	6.2%
Industry	*$42,888,528*	*4.6%*	*$43,317,167*	*4.3%*	*$428,639*	*1.0%*
Foundations	*$21,343,396*	*2.3%*	*$23,857,411*	*2.3%*	*$2,514,015*	*11.8%*
State of Mich.	*$5,096,990*	*0.5%*	*$4,555,854*	*0.4%*	*-$541,136*	*-10.6%*
Total U-M	$212,172,230	22.8%	$249,658,912	24.6%	$37,486,164	17.7%
Total Expenditures	$929,004,340		$1,016,565,913		$87,561,573	9.4%

A year ago, we reported a substantial increase of 11% in industry support for our research between FY2007 and FY2008. The FY08 to FY09 change is one percent, which appears to be a setback. Table 3 takes a second look at our industry volume by breaking out the three sources of private sector research support. In addition to direct contracts with industry, the U-M also receives funds via subcontracts from industry and from grants with company-support foundations and professional organizations. Indeed, if we take into consideration subcontract growth, the actual rise in industry research for this most difficult year in decades indicates a growth of 6.1%.

Table 3: U-M Industry Research Support, FY2008-2009

	FY08	FY09	% Chg.
Industry Research (total)	$58,636,309	$62,215,932	6.1%
Direct Contract	*$42,888,528*	*$43,317,167*	*1.0%*
Subcontract	*$14,136,767*	*$15,969,455*	*13.0%*
Corp. Foundations, Prof. Org., etc.	*$1,611,014*	*$2,905,426*	*80.3%*

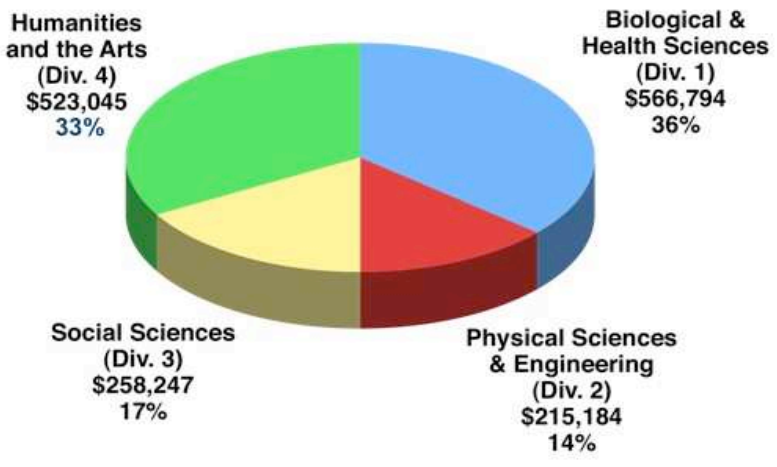
Another useful snapshot of the research enterprise is the breakdown of expenditures by University unit. In Table 4, the expenditures for FY2009 are allocated to each school and college and the percent change from FY2008 for each is noted. As has been the case for many years, the Medical School's portfolio is the largest on campus, at nearly 44% of the University total. Engineering, ISR, LSA and Public Health round out the top five. OVPR units represent the collection of independent research units that report to OVPR rather than a school or college. Additional details can be found in Appendix III.

Table 4: Research Expenditures by U-M Unit, FY2009

	FY09 (change from FY08)		FY09 (change from FY08)
Medical School	$445.8M (24.6%)	Rackham	$5.1M (21.4%)
Engineering	$160.2M (18.5%)	Nursing	$4.9M (-1.7%)
ISR	$97.4M (7.6%)	Social Work	$4.5M (-8.2%)
LSA	$85.4M (5.9%)	Law	$4.5M (164.8%)
Public Health	$54.0M (8.3%)	Information	$4.2M (-17.9%)
OVPR Units	$35.4M (4.8%)	Kinesiology	$3.5M (21.9%)
Dentistry	$16.2M (17.6%)	Public Policy	$2.4M (-5.1%)
Education	$12.8M (-6.4%)	CA&UP	$1.4M (39.3%)
SNRE	$12.8M (12.9%)	UM-Flint	$552K (-14.6%)
Business	$9.3% (0.7%)	Music	$321K (-4.8%)
Pharmacy	$7.3M (3.0%)	Art and Design	$131K (14.6%)
UM-Dearborn	$6.3M (-2.6%)	Other Units	$26.7M (38.9%)

One significant way that OVPR contributes to research and scholarship in the schools and colleges is through its Faculty Grants and Awards program. Figure 3 shows the breakdown of OVPR allocations for FY2009 by broad disciplinary area, as defined by the Rackham Graduate School divisions. The program provides bridging funds for externally supported but lapsed projects, seed funding for young faculty as well as for senior faculty who are changing research directions. One-third of the total funding from this program was directed at supporting the arts and humanities, although the total external funding brought in by these fields is less than 1% of our total research volume.

Figure 3: OVPR Faculty Grants and Awards Program Allocations by Division, FY2009



A significant OVPR responsibility is oversight of the Office of Technology Transfer. One measure of our effectiveness in working with industry is found in OTT's performance trends. Figures 4 and 5 show those trends since 2002.

It is not surprising that the number of license agreements declined last year, considering the state of the economy. On the other hand, invention reports and patent applications grew to record levels, which sets us up for continued growth in the future.

Figure 4: Office of Technology Transfer Performance Indicators, FY2002-2009

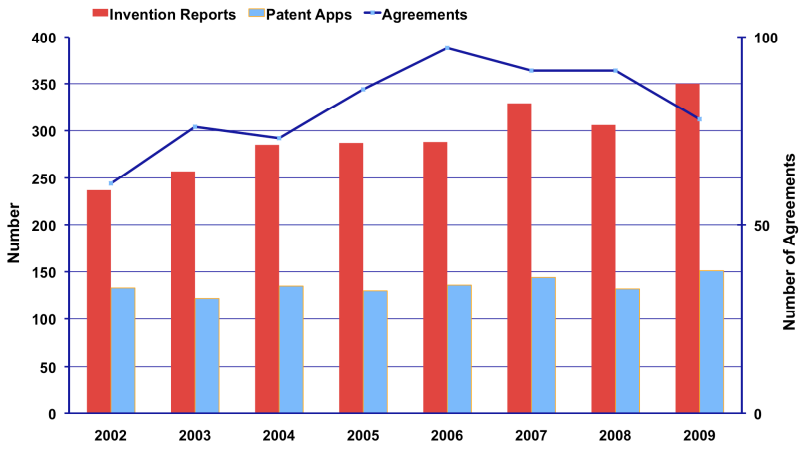
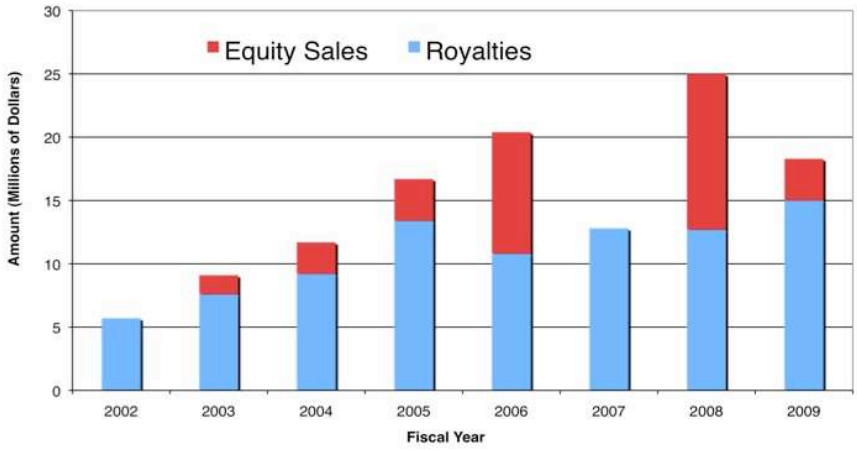


Figure 5: Office of Technology Transfer Revenues, FY2002-2009



The Business Engagement Center (BEC) was established in fall 2007 to provide a gateway for members of the private sector wishing to utilize U-M resources or partner with our faculty. The operation reports to both OVPR and the U-M Office of Development. In May 2008, the BEC opened its central office in the Galleria Building on South University Avenue, where it is co-located with the U-M Office of Technology Transfer. A satellite BEC office in the College of Engineering serves to broaden the organization's outreach to the business community. Together, the offices work to create and expand

partnerships with companies by linking business needs with University resources in research, technology, education and student talent on the Ann Arbor, Flint and Dearborn campuses.

The BEC plays a key role as a partner in local economic development and works closely with other organizations such as Ann Arbor SPARK, Michigan Economic Development Corporation, and Chambers of Commerce around the state. Through these partnerships, facilitated by the BEC, the University can expand its footprint in the business community by helping to attract, retain and nurture high-growth companies. Over the past year, the BEC has processed some 400 inquiries from businesses, and the number of requests for assistance continues to grow.

Federal Stimulus Funds

Starting in the latter part of FY2009, U-M faculty began receiving research awards which came from so-called "stimulus" funding, grants made by federal funding agencies with funds provided by the American Recovery and Reinvestment Act (ARRA). U-M faculty have done very well in competing for these funds, the bulk of which will appear in the research expenditure reports for FY2010 and FY2011. Through November 2009, the U-M has been awarded funding for 390 projects totaling $218.4 million. This support will jump-start a broad variety of research projects of benefit to society in the form of valuable knowledge and new technologies. Table 5 is a list by school, college and other units of the total ARRA-based award amounts as of December 31, 2009. [Note: Table 2 does not report ARRA-based expenditures.] The five largest projects are listed in Table 6.

Table 5: Total funds awarded under ARRA by Unit (as of Dec. 31, 2009)

Totals:	390 Projects	$218,373,445
Medical School		$68,065,708
College of Engineering		$45,437,641
School of Public Health		$33,778,574
Institute for Social Research		$33,196,443
College of Literature, Science & the Arts		$19,335,734
Life Sciences Institute		$4,508,615
School of Dentistry		$4,079,171
Rackham Graduate School		$3,748,253
College of Pharmacy		$2,021,010
School of Information		$1,286,781
Center for Human Growth & Development		$1,263,158
School of Nursing		$373,890
VP for Student Affairs		$296,863
Department of Public Safety		$288,528
School of Kinesiology		$198,189
Ross School of Business		$192,587
School of Nat Resource and Environment		$168,915
U-M Dearborn College of Arts, Science & Letters		$128,385
University Hospitals & Health Centers		$5,000

Table 6: Five largest grants awarded under ARRA to U-M

- **Center for Solar and Thermal Energy Conversion in Complex Materials**
  Peter Green, College of Engineering, $19,500,000 (5 years)
- **Low-Pass Sequencing and High-Density SNP Genotyping for Type 2 Diabetes**
  Michael Boehnke, School of Public Health, $17,863,520 (2 years)
- **Health and Retirement Study**
  David Weir, Institute for Social Research, $8,032,621 (2 years)
- **National Resource for Genetic Research in Behavioral and Health Sciences**
  David Weir, Institute for Social Research, $6,741,000 (2 years)
- **Molecular phenotypes of rapidly progressive idiopathic pulmonary fibrosis**
  Fernando Martinez, Medical School, $6,434,114 (2 years)

Conclusion

In FY2009, U-M surpassed $1 billion in research spending for the first time. Likewise, the faculty has demonstrated considerable success in competing for "stimulus" funds to support research. As shown in the Table 7 below, U-M ranks third overall in total research expenditures as of 2008 according to the tally made by the National Science Foundation. This demonstrates the insight and ingenuity of our faculty and the proficiency and efficiency of our administrative systems, which have handled a growing amount of business over the last several years. We anticipate that federal support for research is likely to continue to grow over the next few years, but not at the pace it has over the last decade. Our success at increasing industry engagement and our ability to utilize the facilities at the North Campus Research Complex for new research programs will be key to the University's continued success in the future. This remains a time of enormous opportunity for U-M to transform, and even define the future of academic research. We must remain creative in our approaches, and continue to incent our faculty to be the best in their fields, while leveraging the once-in-a-century opportunity afforded by the acquisition of NCRC.

Table 7: Rank of top 10 Universities by Total Research Expenditures



Institution	FY 2007	FY 2008	% Change
UC-San Francisco	$843M	$885M	+5.0%
Wisconsin	$841M	$882M	+4.9%
Michigan	$809M	$876M	+8.3%
UCLA	$823M	$871M	+5.8%
UC-San Diego	$799M	$842M	+5.4%
Johns Hopkins [1]	$776M	$836M	+7.7%
Duke	$782M	$767M	-1.9%
Washington	$757M	$765M	+1.1%
Pennsylvania	$648M	$708M	+9.3%
Ohio State	$720M	$703M	-2.4%

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Research and Development Expenditures at Universities and Colleges, FY 2008.

1) Total excludes $778M (2007) and $845M (2007) in R&D expenditures for the federal Applied Physics Laboratory on the JHU campus.

Appendix I

A Very Loud Number

by Stephen R. Forrest
Vice President for Research
University of Michigan

Posted on "Research Views" blog on November 24, 2009
http://research.umich.edu/blogs/vpr/

By now, many have heard that the University of Michigan broke the $1,000,000,000 threshold for research expenditures in Fiscal Year 2009 (FY09). Indeed, by National Science Foundation accounting, U-M has moved into third place for research expenditures by U.S. universities in 2008 (the latest year for which such numbers are available). Only the University of California at San Francisco and the University of Wisconsin rank higher.

But wait! There are even more numbers I could mention. For example, at our last count, the U-M has earned $150 million in ARRA research funds (otherwise known as "stimulus" spending), the largest share among all universities in the country.

This is all great news. However, these "loud" numbers (especially that $1B milestone) can drown out some important messages. Most prominently, I must point out that the U-M can only do this well by having one of the highest quality and most productive faculty on the planet.

Indeed, it is crucial to realize that our great research depth is due to the contributions of thousands of players, working in hundreds of different disciplines. Unlike a large company where teams of employees focus with unwavering attention on making a specific product successful, our success comes from our intellectual diversity. In some ways, U-M's achievements are indicative of our lack of focus on a single objective. Our impact becomes even more impressive when we assemble teams of researchers to explore strategic areas of need or interest. New ways of thinking are born, spawning approaches to problems never before tried.

While we laud our faculty and their productivity, we also must not forget that research successes usually require making strategic investments long before we can confidently predict that such investments will pay off.

Likewise, the quality of our faculty was not built over night. It is the result of 192 years of applying a concerted vision to create the best institution of higher education in the country. And because of that enduring effort, we should never take such a resource for granted. Many seemingly first-rate institutions that have taken decades to establish their excellence, have squandered their long efforts in a heart beat. The closing of the highly creative Bell Labs last year comes immediately to mind.

Our faculty members have put forward time and again both fascinating and important ideas for study and development. It might be our social scientists who collaborate with the military to try to understand how best to monitor the mental health of soldiers in the face of a rising suicide rate. Or it's our engineers and physicists digging into the nature of materials to improve the capacity to generate electricity from solar energy. And then there are the biomedical scientists who study rare, or "orphan" diseases, that get little attention because of the small number of affected people, yet in the aggregate, affects millions.

These are but three of the thousands of examples from our campus. Indeed, the breadth of our research is a direct reflection of the incredible breadth and excellence of our many schools and colleges at the University of Michigan.

But as times (and the economy) change, how does the U-M maintain and improve its faculty strength? And how do we demonstrate leadership in solving the important questions facing humankind?

The recently acquired North Campus Research Complex (NCRC) provides us with a unique setting to engage in interdisciplinary research, where we can bring together teams of researchers into a common location to solve the really "big" problems posed by an exploding population on a warming planet. To address these problems, we must support faculty groups as well as work with government and industry partners.

The enormous energy and terrific ideas of our faculty, the imaginations of our student body, the architecture of the NCRC, the basic can-do spirit of our entrepreneurial community, and our willingness to partner are all ingredients that will catapult U-M into the forefront of research universities in the decades ahead.

This is the big news. If we listen, it overwhelms even the roar of the big numbers that are only one indication of what we can do at the University of Michigan.

Appendix II: U-M Volume of Research Expenditures By Sponsor (FY2008-2009)

SOURCE	FY2008	PERCENT OF TOTAL	FY2009 *	PERCENT OF TOTAL*	PERCENT CHANGE
FEDERAL SOURCES					
Health and Human Services					
National Institutes of Health	393,033,824	42.3%	421,453,708	41.5%	7.2%
Centers for Disease Control	10,306,468	1.1%	12,115,930	1.2%	17.6%
Centers for Medicare & Medicaid Administration	3,162,071	0.3%	2,453,036	0.2%	-22.4%
Health Resources & Services Administration	1,348,345	0.1%	1,629,968	0.2%	20.9%
Substance Abuse and Mental Health Services	873,581	0.1%	1,016,034	0.1%	16.3%
Food and Drug Administration	664,156	0.1%	127,326	0.0%	-80.8%
Other HHS	1,949,600	0.2%	2,565,595	0.3%	31.6%
Total Health and Human Services	411,338,046	44.3%	441,361,597	43.4%	7.3%
National Science Foundation	64,800,692	7.0%	67,280,046	6.6%	3.8%
Army	27,366,889	2.9%	27,904,142	2.7%	2.0%
Navy	10,081,468	1.1%	12,449,204	1.2%	23.5%
Air Force	10,723,473	1.2%	12,336,287	1.2%	15.0%
Other	11,206,577	1.2%	11,665,293	1.1%	4.1%
Total Department of Defense	59,378,407	6.4%	64,354,926	6.3%	8.4%
Energy	17,476,457	1.9%	21,737,061	2.1%	24.4%
N.A.S.A.	15,888,114	1.7%	16,566,350	1.6%	4.3%
Transportation	14,803,527	1.6%	13,129,204	1.3%	-11.3%
Education	7,967,594	0.9%	8,047,389	0.8%	1.0%
Commerce	5,905,347	0.6%	7,429,913	0.7%	25.8%
Social Security Administration	2,627,104	0.3%	2,636,685	0.3%	0.4%
Environmental Protection Agency	1,961,455	0.2%	2,111,037	0.2%	7.6%
Justice	1,766,409	0.2%	1,945,515	0.2%	10.1%
Homeland Security	2,091,359	0.2%	1,616,685	0.2%	-22.7%
Agriculture	1,537,457	0.2%	1,345,734	0.1%	-12.5%
Labor	879,566	0.1%	1,042,181	0.1%	18.5%
Housing and Urban Development	-101	0.0%	997,578	0.1%	N/A
Nuclear Regulatory Commission	--	0.0%	517,305	0.1%	N/A
Interior	429,749	0.0%	420,379	0.0%	-2.2%
Smithsonian Institution	377,919	0.0%	408,256	0.0%	8.0%
State	449,654	0.0%	396,083	0.0%	-11.9%
Agency for International Development	244,540	0.0%	329,879	0.0%	34.9%
Library of Congress	952,058	0.1%	291,910	0.0%	-69.3%
Museum and Library Services, Institute of	9,318	0.0%	212,142	0.0%	2176.6%
National Endowment for the Humanities	116,235	0.0%	211,152	0.0%	81.7%
Central Intelligence Agency	152,385	0.0%	--	0.0%	N/A
Federal Reserve System	49,047	0.0%	--	0.0%	N/A
General Services Administration	126,886	0.0%	--	0.0%	N/A
Other Federal	41,326	0.0%	529,589	0.1%	1181.5%
Total Federal Government	611,370,547	65.8%	654,918,596	64.4%	7.1%
NON-FEDERALSPONSORS					
Industry	42,888,528	4.6%	43,317,167	4.3%	1.0%
Foundations	21,343,396	2.3%	23,857,411	2.3%	11.8%
Public Charities	10,994,717	1.2%	12,914,366	1.3%	17.5%
Other (includes Universities & Gifts)	8,464,140	0.9%	9,338,321	0.9%	10.3%
Trade and Professional Associations	6,136,882	0.7%	8,729,822	0.9%	42.3%
Endowment	9,587,624	1.0%	8,391,020	0.8%	-12.5%
State of Michigan & Local Michigan Authorities	5,096,990	0.5%	4,555,854	0.4%	-10.6%
Foreign National Governments	458,567	0.0%	745,072	0.1%	62.5%
International Organizations	490,720	0.1%	139,889	0.0%	-71.5%
Total Non-Federal Sponsors	105,461,563	11.4%	111,988,922	11.0%	6.2%
Total Sponsored Research	716,832,110	77.2%	766,907,518	75.4%	7.0%
UNIVERSITY OF MICHIGAN SOURCES					
University of Michigan Funds *	212,172,230	22.8%	249,658,394	24.6%	17.7%
TOTAL RESEARCH EXPENDITURES	**929,004,340**	**100.0%**	**1,016,565,912**	**100.0%**	**9.4%**

* Beginning in FY2008, the University began including Medical School's Faculty Group Practice departmental research activity that operates in the Auxiliary Fund. The inclusion of this activity increased research expenditures by $53,250,834 in FY2008 and $44,205,667 for FY2009.

Appendix III: U-M Volume of Research Expenditures By University Unit (FY2008-2009)

UNIT	FY2008	% of Total	FY2009*	% of Total	2008-09 Change
Architecture & Urban Planning, Taubman	$984,315	0.1%	$1,371,319	0.1%	39.3%
Art and Design	$114,360	0.0%	$131,090	0.0%	14.6%
Business Ross School of	$9,257,619	1.0%	$9,324,220	0.9%	.7%
Dentistry	$13,782,797	1.5%	$16,207,652	1.6%	17.6%
Education	$13,690,962	1.5%	$12,820,924	1.3%	-6.4%
Engineering	$135,130,998	14.5%	$160,152,222	15.8%	18.5%
Graduate School, Rackham	$4,199,857	0.5%	$5,099,480	0.5%	21.4%
Information	$5,082,297	0.5%	$4,171,725	0.4%	-17.9%
Kinesiology	$2,834,605	0.3%	$3,455,873	0.3%	21.9%
Law	$1,711,943	0.2%	$4,533,395	0.4%	164.8%
Literature Science, and the Arts	$80,593,256	8.7%	$85,365,727	8.4%	5.9%
Medical School	$357,895,525	38.5%	$445,782,418	43.9%	24.6%
Music	$337,631	0.0%	$321,465	0.0%	-4.8%
Natural Resources and the Environment	$11,368,277	1.2%	$12,831,821	1.3%	12.9%
Nursing	$4,935,855	0.5%	$4,851,284	0.5%	-1.7%
Pharmacy	$7,057,202	0.8%	$7,265,991	0.7%	3.0%
Public Health	$49,877,629	5.4%	$54,035,097	5.3%	8.3%
Public Policy, G Ford	$2,581,012	0.3%	$2,449,488	0.2%	-5.1%
Social Work	$4,888,789	0.5%	$4,485,564	0.4%	-8.2%
Institute of Social Research	$90,452,939	9.7%	$97,370,651	9.6%	7.6%
OVPR Units	$33,730,781	3.6%	$35,353,145	3.5%	4.8%
Other Units	$19,220,127	2.1%	$26,698,354	2.6%	38.9%
U-M Dearborn	$6,456,840	0.7%	$6,289,130	0.6%	-2.6%
U-M Flint	$646,534	0.1%	$551,901	0.1%	-14.6%
University Administration	$1,517,500	0.2%	$826,530	0.1%	-45.5%
Unassignable Services *	$70,654,692	7.6%	$14,819,448	1.5%	-79.0%
Grand Total	**$929,004,342**	**100.0%**	**$1,016,565,913**	**100.0%**	**9.4%**

* Beginning in FY2008, the University began including Medical School's Faculty Group Practice departmental research activity that operates in the Auxiliary Fund. The inclusion of this activity increased research expenditures by $53,250,834 in FY2008 and $44,205,667 for FY2009.



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