Research Expenditures, Sponsored Proposals, and Awards FY 1995

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Introduction

This report provides an assessment of the University's research, scholarship, and creative activity during the past fiscal year, as reflected by three major measures: (1) research expenditures, (2) research proposals, and (3) research awards. These data as well as the wealth of faculty effort undertaken without external support, are indicative of the rich diversity of scholarly activity that has earned the University of Michigan the distinction being one of the nation's leading research universities.

Increases in the annual research expenditures - as measured by absolute dollars and in terms of real purchasing power of these dollars - demonstrate the continued leadership of the University in the advancement of knowledge and in the application of leading-edge technologies for the benefit of society. Research expenditures exceeded the $400 million mark in FY 1995 for the first time in the University's history, a 6.0% increase over the previous fiscal year.

Research proposals submitted provide some indication of the new research opportunities being offered by prospective sponsors. The majority of proposals are in response to specific requests for proposals - RFPs - which, in turn, reflect the highest priority research initiatives of the sponsors. The dollar value requested by the 3,054 proposals submitted in FY 1995 exceeded $1.5 billion.

New research awards must exceed annual expenditures in order for the University to sustain its research momentum in the face of increasing costs. The dollar value of research awards recorded in FY 1995 increased by 10.3% over FY 1994. The "margin" between awards and expenditures in FY 1995 was $41.5 million ($401.9 million in new awards and $360.4 million in expenditures from externally funded sources). Many awards are made on a multi-year basis, and therefore, the available funds cannot be expended in a single fiscal year.

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Research Expenditures

Total research expenditures at the University of Michigan have increased by 124.4% over the past decade, from $182.3 million in FY 1986 to $409.2 million in FY 1995, as shown in Exhibit 1. Real purchasing power of these expenditures (i.e., discounted for inflation) has also continued to increase. Over the past decade, research expenditures increased by 55.8% in constant (FY 1986) dollars. In the past year, total research expenditures increased by 6.0% in current dollars, from $386 million in FY 1994 to $409.2 million in FY 1995. The constant dollar increase during FY 1995 was 2.4%.

Research expenditures from federally sponsored projects increased significantly between FY 1986 and FY 1989 (see Exhibit 2). These expenditures leveled off in FY 1990, however, reflecting the delays in the authorization of federal support for university research in this fiscal period. Renewed confidence in the economy seemed evident in the 15.0% increase in expenditures from federal sources during FY 1991 - the largest increase at the University of Michigan, both in relative and absolute terms, in the past ten years. The 4.0% increase in research expenditures from federally sponsored projects in FY 1995 represents a slowing in the momentum of federal funding for research at the University, closely approximating the national average. Federal projects accounted for two-thirds of the total research expenditures at the University of Michigan in FY

1995.

Expenditures from non-federal sources show an 11.9% increase, from $73.7 million in FY 1994 to $82.5 million in FY 1995. Increases were recorded in support from private for-profit organizations (11.5%), private foundations (5.4%), endowment income sources (57.4%) and state and local governments (103.2%). This increase in research expenditures from non-federal sources helped to offset the slow-down in federal research funds.

Increases in expenditures from federal sources over the past several years have tended to mirror the expenditure patterns of projects funded by the National Institutes of Health (NIH). The increase in expenditures from NIH-supported projects in FY 1994, for example, was the same as the overall increase in federal expenditures - 5.4%. NIH accounted for 56.4% of the total federal expenditures in FY 1995, an increase of 3.3%, slightly lower than the overall increase from federal sources.

After two years of double digit growth, expenditures from projects sponsored by the National Science Foundation increased by only 1.4% in FY 1995. The slow growth in NIH and NSF project support was partially offset by the 20.7% increase in expenditures from projects sponsored by the Department of the Defense. Included among these DOD projects were five major awards from the Department of Army in support of breast cancer research.

Indirect cost recoveries from externally funded research projects increased by 6.8% - from $79.2 million in FY 1994 to $84.6 million. Of these indirect cost recoveries $74.7 million, or 88.3%, came from federally funded research projects.

University funds in support of research accounted for $48.9 million (11.9%) of the $409.2 million in total research expenditures in FY 1995. These funds have been committed to meet critical capital facilities and equipment needs in support of the research mission, as well as the increase in University cost sharing expectations on federal grants and contracts. Over the past five years, these commitments have remained fairly constant, however, even as the total expenditures for research have risen.

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Research Proposals

While the number of proposals submitted to prospective sponsors in FY 1995 remained approximately the same as in the previous fiscal year, the dollar value requested increased by 11.1% to $1,568,712,116. The dollar level of support requested of federal sponsors exceeded $1.34 billion (a 14.0% increase). The dollars requested of non-federal sponsors declines by 3.4% to $226.1 million, in large measure, due to the fact that the FY 1994 totals include a major proposal to the State of Michigan which resulted in a one-time award of $20.0 million.

The dramatic increase in the dollar value of proposals submitted to NASA is largely attributable to a single proposal for $234.8 million - the largest ever submitted by the University - to support "MUADEE: Mars Upper Atmosphere Dynamics, Energetics and Evolution." A major proposal was also submitted to the Department of Labor, accounting for the significant increase in support requested from that agency.

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Research Awards

The dollar value of research awards in FY 1995 increased by 10.3% over FY 1994. The number of awards (1,545) increased by 3.8%. The 23.3% increase in federal awards (to $298.5 million) was partially offset by a 15.4% decrease in award dollars from non-federal sponsors. The University received a large, multi-year award in FY 1994 from the State of Michigan to support the research program of the Center for High Definition Display Technologies. No award was received in FY 1995 comparable to this $20 million, five-year funding, contributing to the apparent decline in non-federal award dollars.

The "margin" between awards and expenditures in FY 1995 was $41.5 million ($401.9 million in new awards and $360.4 million in expenditures from externally funded sources), the dollar values of which were recorded at the time of the initial award. Many of thse awards are multiple-year grants.

The decrease of 2.7% in the dollar value of awards from the Department of Health and Human Services marks the fourth straight year in which award dollars from DHHS have declined. Major funding from the National Institutes of Health in support of various research centers at the University is on a five-year cycle, with the most recent awards being recorded in FY 1991 and FY 1992, which tends to "inflate the base" when comparisons are made with the more recent data.

The $49.9 million in awards received from the National Science Foundation includes $13.9 million in support

of the Center for Ultrafast Optical Science over the next five years. The dollar value of awards from the Department of Defense increased by 144.1% and included $7.5 million from the Advanced Research Projects Agency (ARPA) to fund a project to design the optimization of a microprocessor, and the $7.4 million from the Army in support of the Automotive Research Center.

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Research Portfolio by University Unit

Several factors affect the distribution of research support among University units: availability of external support in various fields, relative cost of undertaking research activities, size of the academic unit, relative emphasis placed on research, and national competitive position. Disciplines/units which receive more multi-year awards from federal agencies will account for a larger percentage of the dollar value of awards when compared to their expenditures in any given fiscal year.

Collaborative efforts across unit boundaries further complicate an accurate reflection of this distribution. Faculty who have joint appointments tend to route their proposals through only one of their units (for example, the Institute for Social Research includes a large number of faculty with joint appointments in the College of Literature, Science and the Arts).

Research expenditures in the Medical School increased by 7.9% in FY 1995, which was a major contributing factor to the overall growth in research expenditures, since the Medical School accounts for 34.3% of the University's total research expenditures.

Research expenditures in the College of Engineering increased by 3.8%, from $80.9 million to $84 million. Expenditures in the School of Social Work increased by 42%, from $6.5 million to $9.3 million. Research expenditures also increased significantly in the School of Natural Resources and Environment (34.4%), the School of Business Administration (17.7%), the College of Pharmacy (12.1%), and the School of Dentistry (10.1%). Expenditures in support of research in the College of Literature, Science and the Arts decreased by 1.2%, while expenditures in the Institute for Social Research decreased by 0.25%.

Research proposals showed an 11.1% increase in the dollar value of proposals submitted in FY 1995. The significant increase in dollar value of proposals submitted by the College of Engineering (83.5%) can be attributed to the $234.8 million proposal to NASA to support "MUADEE". The 35.2% increase in proposed dollars requested by the Institute for Social Research, in large part, is the result of a $40 million proposal to the Department of Labor.

The dollar value of research awards increased by 10.3% overall. Significant increases were recorded in Natural Resources and Environment (124.9%), Nursing (73.4%), Engineering (42.4%), Pharmacy (41.9%), Information & Library Studies (37.2%), and Literature, Science & the Arts (35.5%). The dollar value of awards received by the Medical School declined for the fourth straight year, again due in large part to the cycle on which many large NIH multi-year awards are received by the University.

Ten-year trends for the largest units on the Ann Arbor campus are presented in Exhibit 9. Trends for all other Ann Arbor units are detailed in Appendix A. Research expenditures in the Medical School have increased by 159.1% in the period since FY 1985. In the College of Engineering, research expenditures have increased nearly threefold over the past ten years. Research expenditures in the College of Literature, Science, and the Arts (66.6%) and the Institute for Social Research (101.6%) have recorded significant increases during this same period. It is important to recognize that research opportunities during the decade of the 1980's have been largely centered in the fields of medicine, engineering, biotechnology, and applied science and technology.

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Research Expenditures by Broad Fields of Study

A ten-year comparison of the distribution of research expenditures among six broad fields of study is provided in Exhibit 10. During this ten year period, the University's research expenditures increased by 157.0%, from $159.2 million to $409.2 million, for an average increase of over 9.9% per year.

The Life Sciences continues to maintain a dominant position in terms of the University's research expenditures, recording a 134.2% increase over the past ten years and accounting for $182.2 million (44.5%) of the total expenditures in FY 1995. However, the relative share of the total research dollars spent in support of the Life Sciences has declined since FY 1985, when the $77.8 million represented nearly 49% of the total expenditures.

Engineering accounted for 17.5% of the total research expenditures in FY 1985 ($27.9 million), but with a

phenomenal doubling of expenditures in five years, accounted for 19.6% of the total in FY 1990. Engineering has maintained its 19.6% share of the University research expenditures over the past five years, with $80.2 million in expenditures in FY 1995.

The Social Sciences continue to show a significant research capacity at the University of Michigan, accounting for 13.8% of the total research expenditures in FY 1995. The $56.5 million in expenditures represents a 177.0% increase over the $20.4 million expended in FY 1985.

Research expenditures in the Physical Sciences recorded a 259.0% increase over the past ten years. The $51.7 million spent in FY 1995 accounted for 12.6% of the total research expenditures.

[The beginning of *Research Report FY95 -- The Numbers*]

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