Research and Scholarship: Expenditures, Proposals, and Awards

FY 2000

This report provides an assessment of the University's research efforts during the past fiscal year, as reflected by three major measures: (1) research expenditures, (2) research proposals, and (3) research awards. These data reflect the rich diversity of research activities and capabilities that have earned the University of Michigan the distinction of the nation's leading public research university.

Increases in annual expenditures in support of research demonstrate the continued leadership of the University in the discovery of new knowledge and in the application of leading-edge technologies for the benefit of society. Research expenditures in FY 2000 totaled $545.4 million, recording a 9.1% increase over the previous fiscal year.

Research proposals submitted provide some indication of the new research opportunities being offered by prospective sponsors and reflect the responsiveness of the faculty to these program opportunities. 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 of the 3,459 proposals submitted in FY 2000 exceeded $1.9 billion.

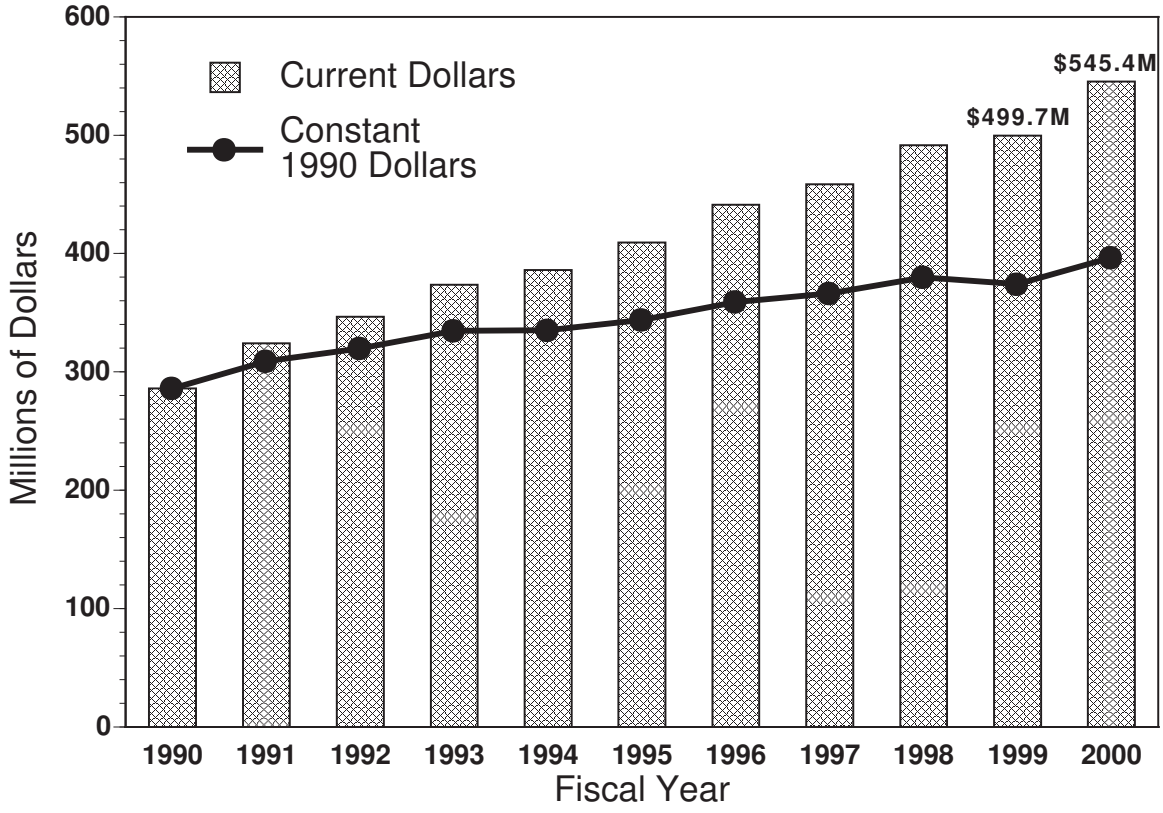
New **research awards** should exceed annual expenditures in order for the University to sustain its research momentum in the face of increasing costs. In FY 2000, this "margin" between awards and expenditures was $108.2 million ($653.6 million in new awards and $545.4 million in expenditures from externally funded sources). Compared to FY 1999, the dollar value of research awards recorded ($451.9 million) was less than the expenditures ($499.7 million). Many awards are made on a multi-year basis. Therefore, a portion of the dollars awarded in any given year may be spent in subsequent years. Nonetheless, we believe this marked increase speaks to the continued strength of our faculty in winning competitive awards.

Research Expenditures: FY 2000

Total **research expenditures** at the University of Michigan have increased by 90.6% since FY 1990, from $286.1 million to $545.4 million, as shown in Exhibit 1. Real purchasing power of these expenditures (i.e., discounted for inflation) has also continued to increase. During this same time period, research expenditures increased by 30.8% in estimated constant (FY 1990) dollars. During the past fiscal year, total research expenditures increased by 9.1% in current dollars, from $499.7 million in FY 1999 to $545.4 million in FY 2000. The estimated constant dollar increase during FY 2000 was 6.0%.

Indirect cost recoveries from externally funded research projects increased by 7.0%—from $106.5 million in FY 1999 to $114.0 million in FY 2000.

Exhibit 1
Research Expenditures FY 1990 - 1999



An estimated Research and Development Price Index (see above) was used to convert R&D expenditures to constant dollars.

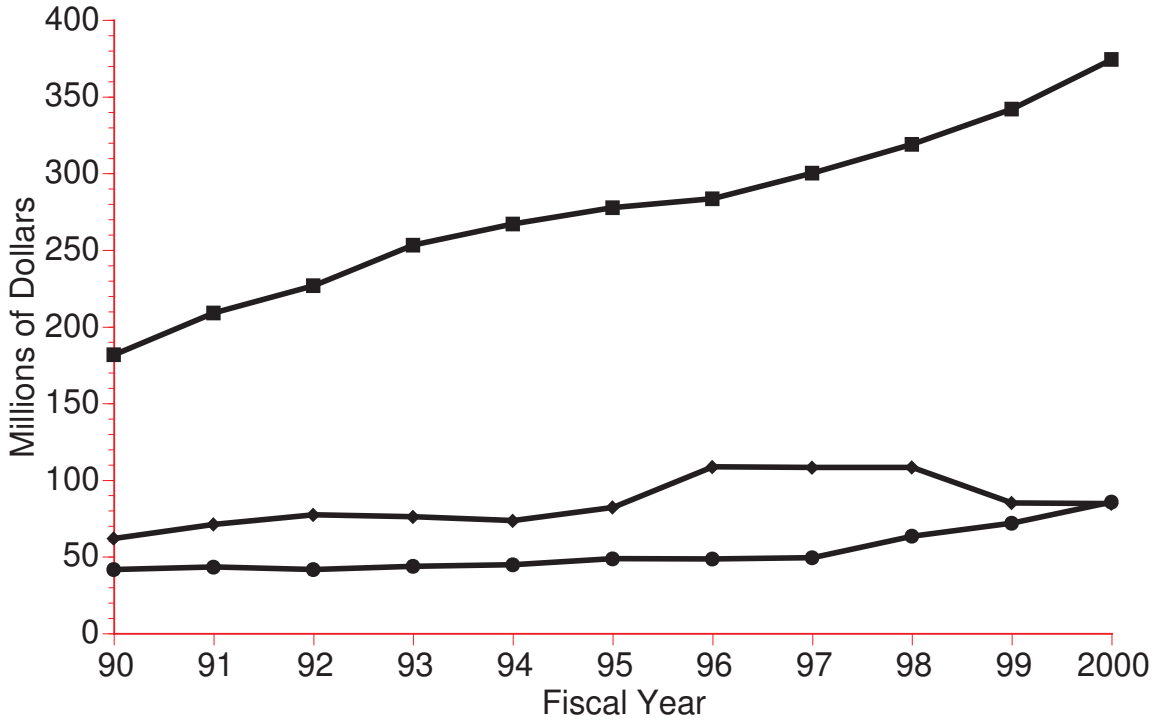
Federal projects accounted for 68.7% of the total research expenditures at the University of Michigan in FY 2000, up slightly from a 68.5% share in FY 1999. Since FY 1990, research expenditures from federal sources have increased by 105.9%, from $182.0 million to $374.6 million.

As shown in Exhibit 2, research expenditures from federally sponsored projects increased 15% in FY 1991--the largest increase at the University of Michigan in this period, both in relative and absolute terms. This growth trend continued through the 1990s. The 9.5% increase in research expenditures from federal sources in FY 2000 represents a continuing improvement from the FY 1999 increase of 7.2% and further improvement over the FY 1998 increase of 6.2%.

Since FY 1990, research expenditures from non-federal sources have increased by 36.5%. A decline of 0.6% was recorded in the past fiscal year, from $85.4 million in FY 1999 to $84.9 million in FY 2000. Non-federal expenditures accounted for nearly 15.0% of the total research expenditures from all sources. Significant increases were recorded in support from public charities (17.3%), foundations (7.0%), and endowment income (230.8%). Significant decreases were noted in state and local governments (-9.4%), Trade and Professional Associations (-14.6%), and other sponsors (-24.1%).

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). Expenditures from NIH supported projects in FY 2000

EXHIBIT 2
TREND IN RESEARCH EXPENDITURES
BY FEDERAL AND NON-FEDERAL SOURCES, FY 1990 - 2000

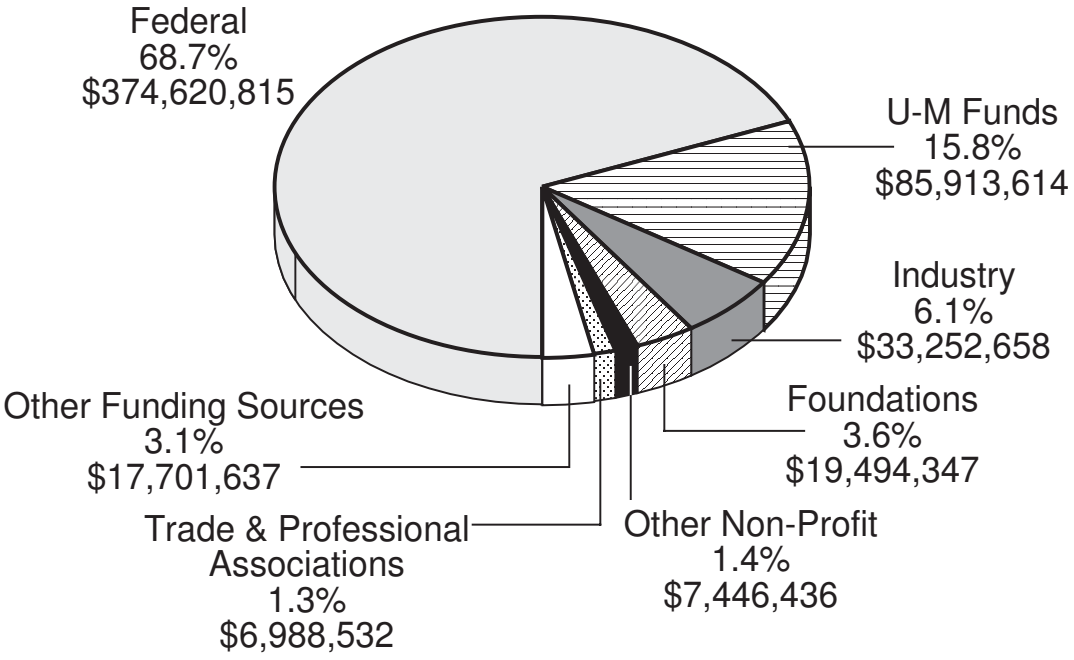


increased by 14.0%. The overall increase in federal expenditures was 9.5%. NIH accounted for 61.4% of the total federal expenditures in FY 2000 compared with 59.0% in FY 1999.

Expenditures from projects sponsored by the National Science Foundation (NSF) declined by 2.0% in FY 2000. The decline in NSF support was mirrored somewhat by a 3.6% decline in expenditures from projects sponsored by the Department of Defense.

University funds in support of research accounted for $85.9 million (15.8%) of the $545.4 million in total research expenditures in FY 2000. These funds have been committed to meet critical capital facilities and equipment needs, as well as the increase in University cost sharing expectations on federal grants and contracts.

EXHIBIT 3
RESEARCH EXPENDITURES BY SPONSOR GROUP FY 2000

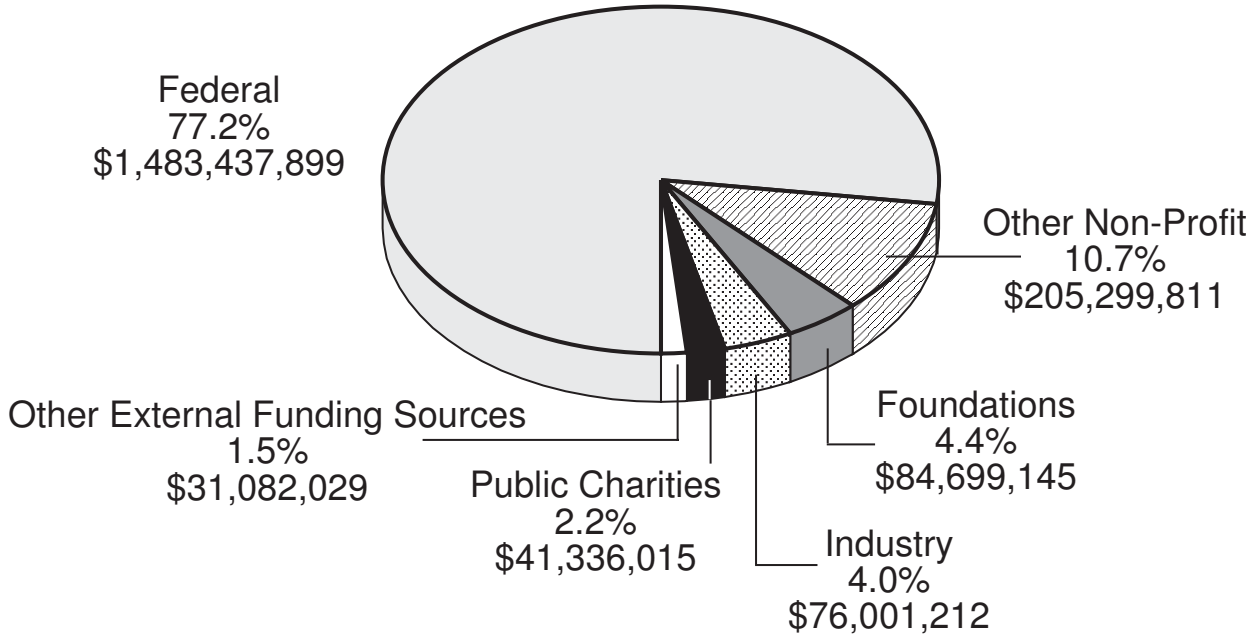


Total Research Expenditures $545,418,039

Research Proposals

The total dollar value of research proposals submitted by the University to prospective sponsors has increased by 59.1% since FY 1990, from $1.40 billion to $1.92 billion. The dollar value requested in FY 2000 represented a 3.4% increase over the $1.86 billion submitted in FY 1999. The dollar level of support requested of federal sponsors in FY 2000 declined by 5.2% to $1.48 billion, while the dollars requested of non-federal sponsors increased by 49.1% to $438.4 million. The distribution of proposals submitted in FY 2000 is shown in Exhibit 4.

Exhibit 4
Research Proposals by Sponsor Group FY 2000

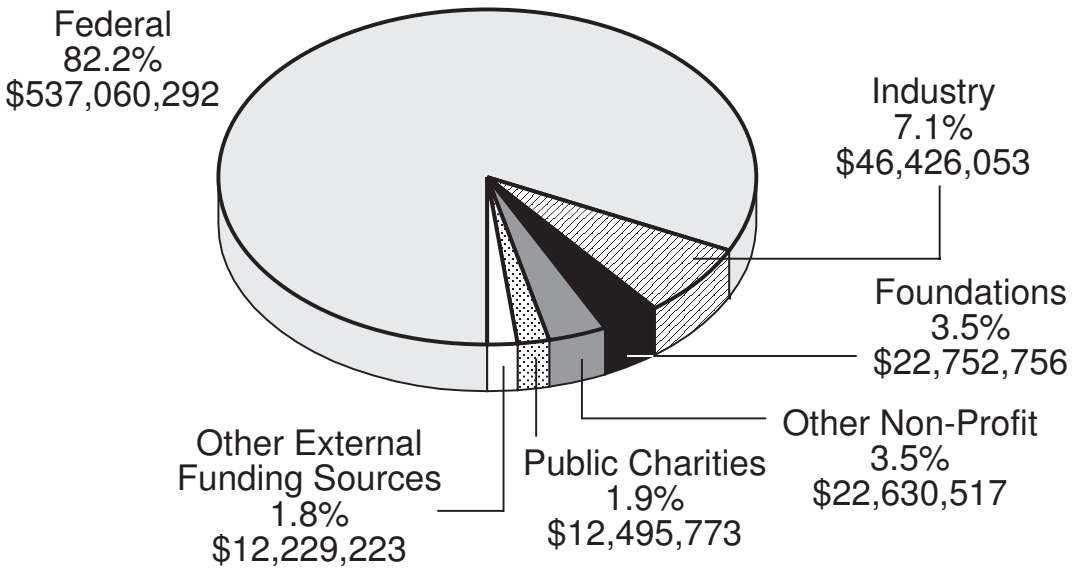


Total Research Proposals $1,921,856,111

Research Awards

The total dollar value of research awards recorded by the University since FY 1990 has increased by 73.9%, from $375.8 million to $653.6 million. The dollar value recorded in FY 2000 represented an 44.6% increase over the $451.9 million recorded for FY 1999. The dollar level of support from the federal sponsors increased by 67.0% to $537.1 million, while the dollars awarded by non-federal sponsors declined by 10.6% to $116.5 million. An increase in NIH support, the largest sponsor of University research was realized at 71.6%. There was a 70.9% increase realized by NSF, the second largest sponsor of University research, in FY 2000 when compared with FY 1999.

Exhibit 5
Research Awards by Sponsor Group FY 2000



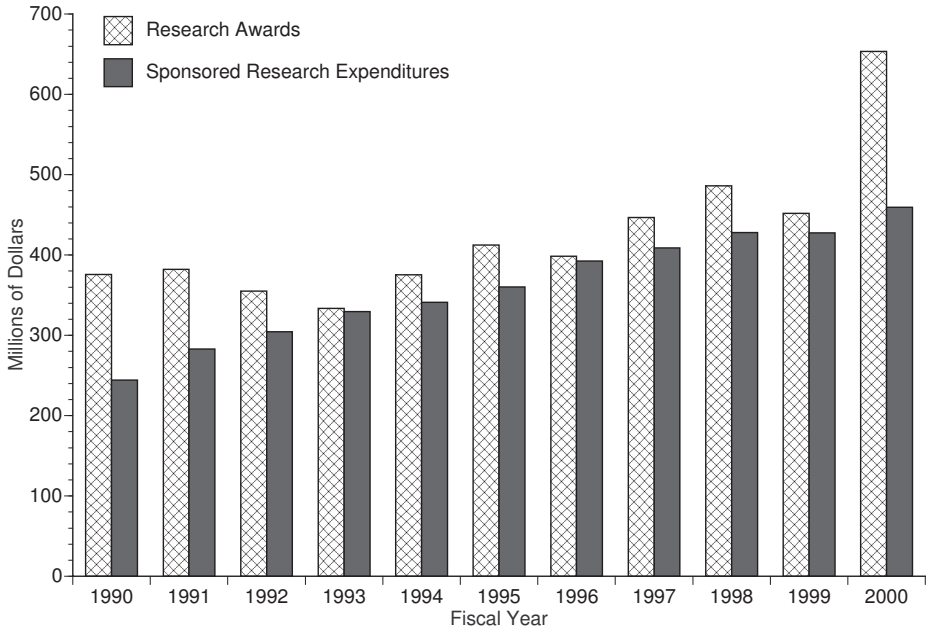
Total Research Awards $653,594,614

Research Awards and Expenditures from External Sources

The full amount of a research award is recorded in the year in which the notification is received. Often, these funds are expended over several years, however, making year-to-year comparisons between data on awards and expenditures somewhat misleading. A $10-million award from NIH for the period October, 1999 through September, 2004, for example, would be recorded in the fiscal year in which it was received—which might be FY 1999 or FY 2000. These funds, however, will be expended over the five-year period, but not necessarily in equal installments. The acquisition of equipment as part of the start-up period may result in a more significant portion of the funds being expended in FY 2000 than in other fiscal periods.

As shown in Exhibit 6, research expenditures from external sources have shown a steady upward trend since FY 1990, increasing from $229.56 million to $459.50 million. During this same period, research awards have exhibited some "peaks" and "valleys." In FY 1990 and FY 1991 research awards exceeded research expenditures by $148.0 million and $119.0 million respectively. Several major research centers

Exhibit 6
Comparison of Research Expenditures and Awards



received multi-year funding from the NIH in FY 1990. In FY 1991, the University received two large, multi-year, non-federal awards—for $28 and $30 million—which resulted in a significant increase in total awards and a relatively large margin ($99.4 million) between awards and expenditures. The "margin" between awards and expenditures was relatively narrow in FY 1993, 1996, and again in FY 1999. A dramatic increase of awards over expenditures was realized in FY 2000 resulting in a margin of $194.09 million between awards and expenditures. This rise is caused by an increase of several large awards. Most notable is a $44.3 million NIH award that began in April 2000 and is expected to run until December 2005.

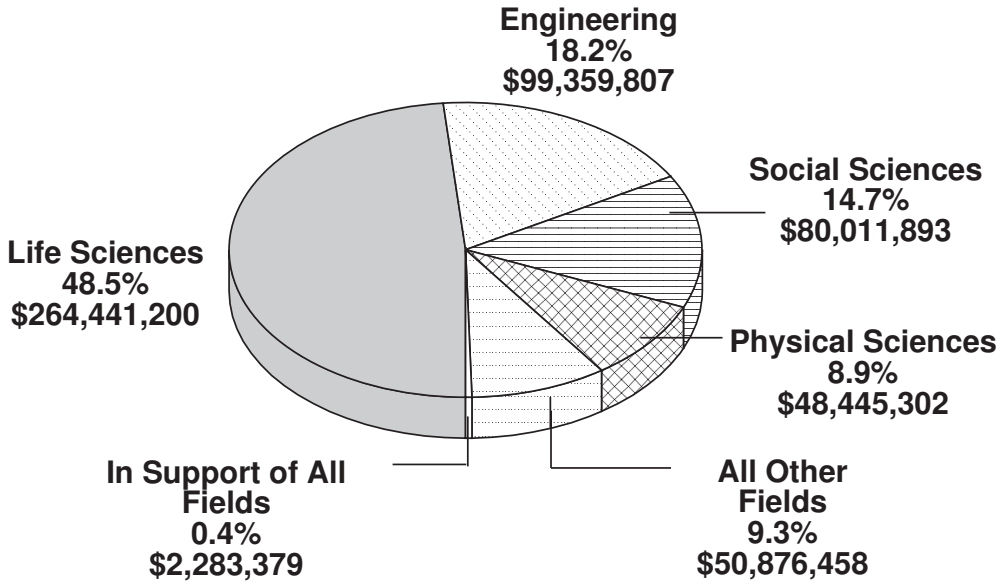
Research Portfolio by Field of Study

The distribution of research expenditures, awards, and proposals based on the six broad fields of study defined by the National Science Foundation provides another useful vantage point for understanding the University's research portfolio. These fields of study consolidate dollar values across organizational lines within the University. The field of Life Sciences, for example, includes research activities in the Medical School, the College of Literature, Science, and the Arts, the School of Public Health, the School of Nursing, the College of Pharmacy, the School of Dentistry, the College of Engineering, and various research centers and institutes. The field of Engineering includes research activities in the College of Engineering, as well as projects outside the College. The category, "All Other Fields," represents projects conducted by faculty in the Schools of Business Administration, Education, and Law, as well as the International Institute.

Several factors affect the distribution of research support among University units/disciplines: 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 with greater access to federal agencies that provide multi-year awards 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).

Exhibit 7
Research Expenditures by Field of Study FY 2000



Total Research Expenditures $545,418,039

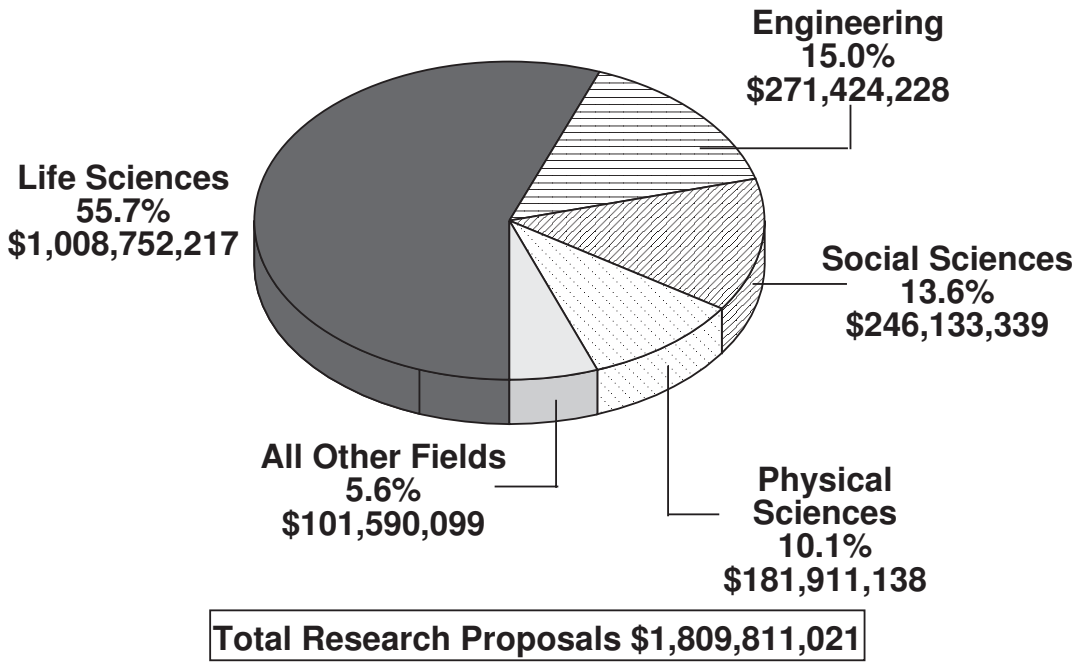
Research expenditures in the Life Sciences increased by 21.1% in FY 2000, which was a contributing factor to the overall growth in research expenditures, since the Life Sciences accounts for 52.2% of the University's total research expenditures.

In the last year, research expenditures in the Engineering fields increased by 14.8%, from $97.9 million to $99.4 million. Expenditures in the Social Sciences increased by 16.6%, from $68.6 million to $80.0 million. Research expenditures increased in Physical Sciences by 27.4%. All Other Fields increased by 15.4% between FY 2000 and 1999.

The distribution of research proposals submitted and awards recorded in FY 1999 are shown in Exhibits 8 and 9.

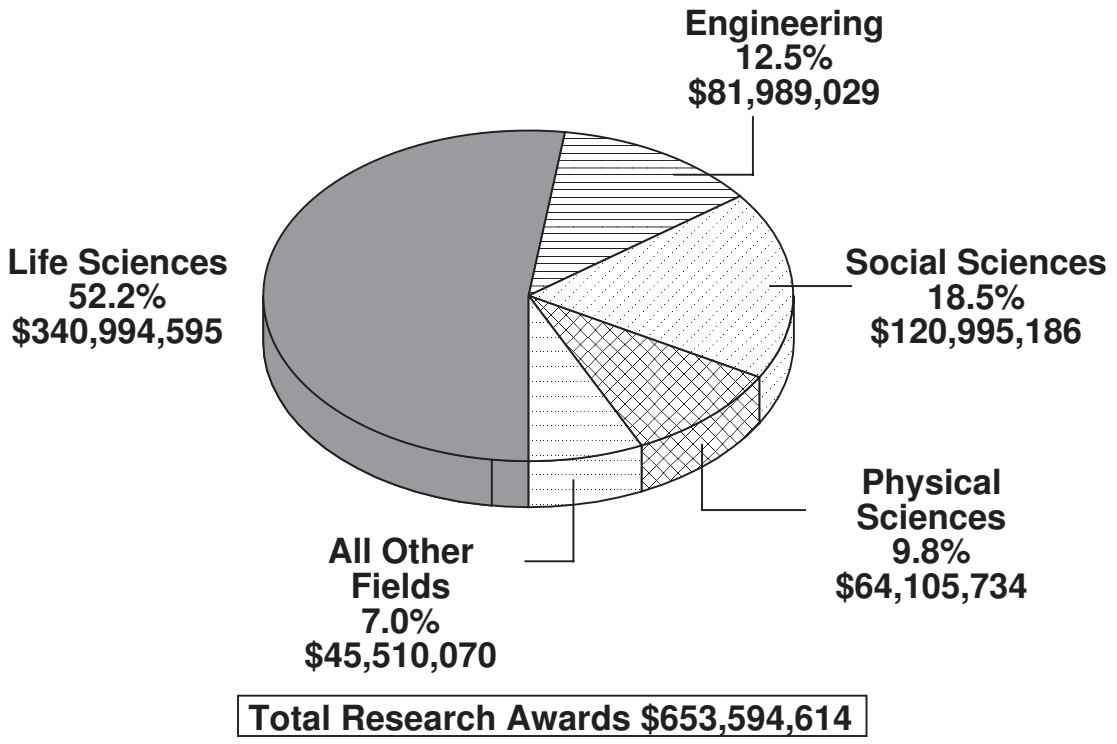
The FY 2000 dollar value of research proposals recorded for Life Sciences increased 12.9% over FY 1999. Engineering disciplines witnessed an increase of 13.2% in the FY 2000 value of research proposals over FY 1999. A decrease of 38.3% in dollar value of Social Science proposals was realized in the last fiscal year. The Physical Sciences experienced a decrease of 13.4% in the dollar value of FY 2000 research proposals. There was an increase of 15.7% in the dollar value of research proposals submitted by faculty in the category, "All Other Fields."

EXHIBIT 8
RESEARCH PROPOSALS BY FIELD OF STUDY FY 2000



The dollar value of awards recorded by the Life Sciences areas increased 36.0%. The dollar value of awards recorded by the Engineering disciplines increased by 44.2%. The Social Sciences showed a 156.4% increase in award dollars. Physical Sciences recorded a 64.6% decrease over FY 1999's experience.

EXHIBIT 9
RESEARCH AWARDS BY BROAD FIELD OF STUDY FY 2000



Total Research Awards $653,594,614

Research Expenditures by Broad Fields of Study

A ten-year comparison of the distribution of research expenditures among the fields of study is provided in Exhibit 10. During this ten-year period, the University's research expenditures increased by 90.6%, from $286.1 million to $545.4 million, for an average increase of 9.1% per year.

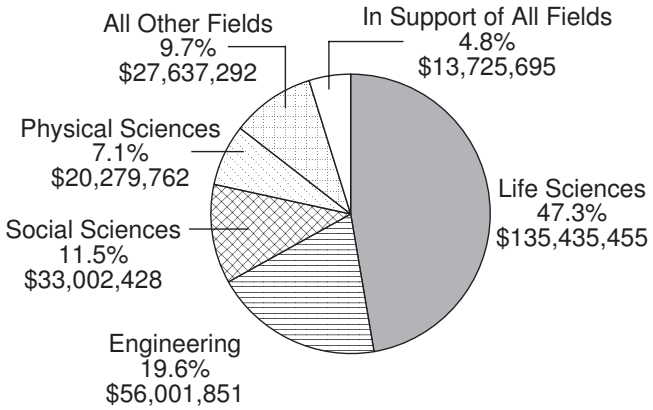
The Life Sciences continue to maintain a dominant position in terms of the University's research expenditures, recording a 95.3% increase over the past ten years and accounting for $264.4 million (48.5%) of the total expenditures in FY 2000.

Engineering accounted for 18.2% of the total research expenditures in FY 2000 ($99.4 million). Engineering has also declined slightly in percent of University research expenditures compared to 10 years ago, from 19.6%, with $56.0 million in expenditures in FY 1990.

The Social Sciences continue to show an increased research capacity at the University of Michigan, accounting for 14.7% of the total research expenditures in FY 2000. The $80.0 million in expenditures represents a 142.4% increase over the $37.0 million expended in FY 1990.

Research expenditures in the Physical Sciences recorded an increase of 138.9% compared to 10 years ago, but has declined in share compared to five years ago. The $51.7 million spent in FY 1995 accounted for 12.6% of the total research expenditures.

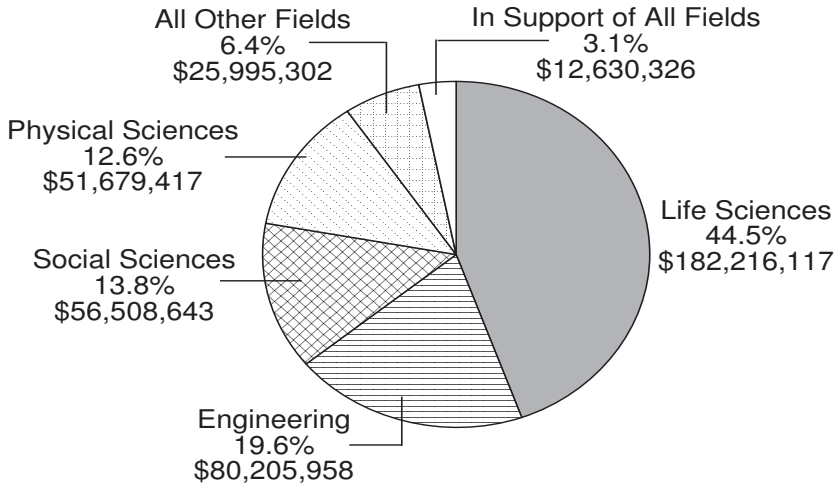
EXHIBIT 10
TRENDS IN RESEARCH EXPENDITURES BY FIELDS OF STUDY



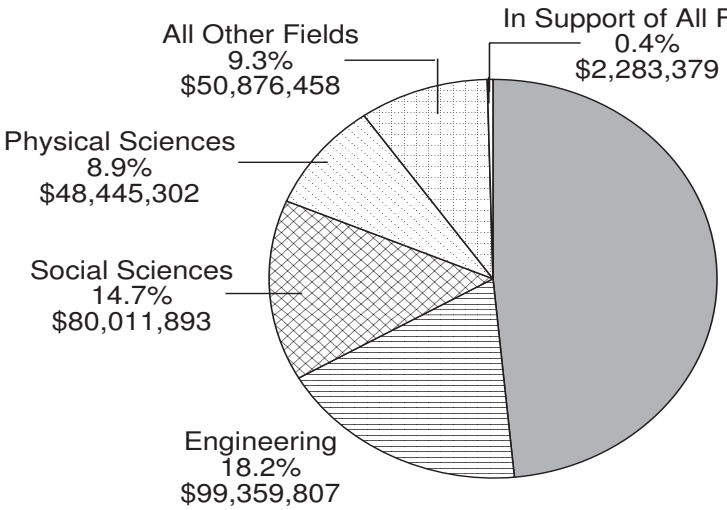
1990
$286,082,486

Research Expenditures $286,082,483

1995
$409,235,763



Research Expenditures $409,235,763



2000
$545,418,039

Research Expenditures $545,418,039