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Highlights

- During FY08, the University of Utah spent approximately $365 million to fund its research activities. Of this total, $313.9 million (86 percent) stayed in Utah.
- When the indirect and induced ripple effects of sponsored research spending are considered, the total annual impact in FY08 was $525.3 million in gross state product (GSP) for the state of Utah. This includes $268.8 million in direct purchases by the University and $256.4 million generated indirectly. Thus, every dollar in direct spending by the U of U generates an additional 95 cents in GSP for the state of Utah.
- Sponsored research directly generated 2,920 full-time-equivalent jobs at the University of Utah. The indirect and induced job creation totaled 4,380, for a total employment impact of 7,300 full-time and part-time jobs in the state of Utah. Thus, for every direct job supported by sponsored research at the U of U, an additional 1.5 jobs are created in other industry sectors.
- The estimated wage bill generated by the University's research spending was $310.0 million: $169.6 million in direct University payroll and $140.4 million in earnings for workers in other industry sectors. This represents an earnings multiplier of 1.83; or for every dollar in earnings paid directly by the U of U, an additional 83 cents of earnings are generated for workers in other industries.
- Sponsored research spending generated $31.4 million in state and local tax revenue in FY08. This includes $26.7 million in state taxes and $4.7 million in tax revenue for local units of government.
- In relation to total economic activity in the state, the impacts of the U of U's sponsored research accounted for slightly more than four-tenths of one percent of both Utah's total employment and total earnings during FY08. The $525.3 million impact on the state's GSP represented almost one-half of one percent of total state GSP in FY 2008.
- Every $1.0 million in sponsored research at the University supports 20 jobs in Utah, generates approximately $849,450 in earnings for Utah workers, contributes $1.4 million in GSP, and provides $86,135 in state and local tax revenue.

The Economic Impact of Sponsored Research at the University of Utah

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Introduction

Research is a defining characteristic of the University of Utah, setting it apart from many other of the state's institutions of higher education. Each year, the University injects millions of dollars into the local economy as it funds these research activities. This spending contributes to the state's economic base in myriad ways—supporting and creating jobs, increasing earnings for Utah residents, and providing tax revenue for state and local units of government.

In 2009 the Bureau of Economic and Business Research (BEBR) at the University of Utah (U of U) was asked by the Office of the Vice President for Research and the Office of Sponsored Projects to identify the economic impact of the University's sponsored research spending on the Utah economy during fiscal year 2008, and based on that analysis, to develop a set of metrics to measure and quantify these impacts on an ongoing basis.

Using information provided by the University's Department of Financial and Business Services and the Department of Compliance and Accounting Reporting, we estimated the impact of research spending on the Utah economy measured by the impacts on jobs, earnings, gross state product, and tax revenue during FY 2008. From this analysis we developed a simple methodology that will allow the University to assess these impacts on an annual basis.

The impacts in this study are based on the U of U's research expenditures. While the impacts of these expenditures capture the ripple effects of direct University spending, they do not capture the full economic contribution of the University's research efforts. Many technologies developed through the research process have potential commercial applications that lead to the creation of new businesses or the expansion of existing ones. These potential impacts could be substantial, but are beyond the scope of this analysis.

Data Development and Methodology

Two types of impacts were estimated in this study. The first set of estimates includes the economic impact of sponsored research spending on gross state product (GSP), employment, and employment earnings. The second type of impact is the fiscal impact of tax revenue that flows to the state of Utah as a result of taxable purchases.

Economic impacts are generated when new money enters a region and is then spent within that region. To estimate the economic impact of the University's research spending on the state, it was necessary to know both the *source* of the money spent for research and the *amount* of money spent locally.

Previous work completed by BEBR for the University of Utah determined that the vast majority of research dollars flowing into the University comes from agencies outside the state; e.g., the National Science Foundation and the National Institutes of Health. Therefore, this analysis treats all sponsored research as "new money." Thus, the starting point in this evaluation was an analysis of the institution's research budget and spending in the local economy. To this end, we conducted a detailed review of the University's research expenditures to determine where money was spent and from which industries purchases were made.

The second part of the analysis combined local expenditures and spending multipliers derived from RIMS II, an econometric input-output model developed by the U.S. Department of Commerce, Bureau of Economic Analysis and regionalized for the state of Utah. Input-output models trace the flow of goods and services through a geographic region, estimating the resultant changes in economic activity that occur as these expenditures work their way through the economy. These statistical models are designed to capture the effects of spending changes in one part of the economy on all other parts of the economy.

RIMS II can be used to estimate the University's economic contribution to employment, earnings, and gross state product in the Utah economy. These contributions are the net changes in economic activity that occur when research dollars are spent locally.

The last part of the analysis was the estimation of the fiscal impacts generated by the University's research expenditures. The estimates were derived by quantifying the relationship between earnings and certain state and local taxes. At the state level, the fiscal impact analysis identified the relationship between earnings and individual income taxes, sales taxes, and other miscellaneous taxes. At the local level, the analysis identified the relationship between earnings and sales taxes and other miscellaneous taxes. These relationships were expressed as ratios that represent the effective state and local tax rates. These ratios were applied to the total earnings impact to estimate tax revenues.

Study Findings

In FY08 the University of Utah spent approximately $365 million to fund its research activities. A large portion of this money was spent locally. Based on BEBR's analysis of University expenditures, approximately 86 percent of all sponsored research expenditures were made in Utah.

The largest share of research spending is payroll-related. On average, payroll-related expenditures have accounted for 46.5 percent of all sponsored research spending over the past 10 years. Put differently, almost 47 cents of every research dollar is spent locally for wages, salaries, and other payroll-related costs. Further, our analysis of information provided by University sources shows that $1.0 million in sponsored research directly supports eight FTE employees. This estimate includes principal investigators as well as support staff. The average remuneration for these employees is $61,242 in salary/wages plus fringe benefits.

About 34 percent of all research spending is related to direct (non-personnel) costs. Of this amount, an estimated 78 percent is spent locally. The remaining 19 percent of research money is spent on overhead, of which 68 percent occurs in Utah.

Based on this information, in 2008 the U of U injected $313.9 million in research-related spending into Utah's economy. When the indirect and induced ripple effects of these expenditures are considered, the impacts are substantial and significant.

Economic Impacts of Sponsored Research

Two types of economic estimates were produced for this study. The first is an estimate of the total economic impact of the approximately $365 million in sponsored research spending made by the U of U during FY08. The second estimate shows the average economic contributions to jobs, earnings, GSP, and tax revenue generated by $1.0 million in University research spending.

With the exception of tax revenues, the total impacts include direct, indirect, and induced economic effects. These terms are discussed in the Appendix.

Employment Impacts

Input-output analysis shows that the economic impact of the University's research spending in FY08 supported a total of 7,300 jobs in the state of Utah, or about four-tenths of one percent of all employment in the state that year. Of this total, 2,920 jobs were FTE positions at the University of Utah. The remaining 4,380 were full-time and part-time jobs in other sectors of the Utah economy. In other words, the total employment impact of research spending is 2.5 times the direct impact.

Based on the employment impact analysis, $1.0 million in sponsored research spending supports 20 jobs in the Utah economy: 8 direct FTE University employees and 12 full-time and part-time jobs in other industry sectors.

Earnings Impacts

In FY08, University research spending generated $310.0 million in earnings for Utah residents, or slightly more than four-tenths of one percent of total earnings in Utah that year. This estimate includes $169.6 million paid in wages and salaries to University employees and $140.4 million received by workers in other industry sectors. Like the employment impacts, the earnings impacts are larger than just the direct earnings paid. In this case, the total earnings impact is about 1.8 times larger than the direct impact.

Based on the earnings impact analysis, $1.0 million in sponsored research translates to $849,450 in earnings for Utah residents: $464,678 in earnings for University employees and $384,772 in earnings for Utah workers outside of the University.

Gross State Product Impacts

In 2008, research spending by the University generated approximately $525.3 million in GSP, or almost one-half of one percent of Utah's GSP that year. This estimate includes $268.8 million generated by direct University purchases and $256.4 million generated indirectly. The GSP impact multiplier is 1.95 times the direct impact.

Based on the GSP impact analysis, $1.0 million in sponsored research generates more than $1.4 million in GSP for the state of Utah: $736,476 derived from direct University spending and $702,586 derived indirectly.

Tax Impacts

The impacts of sponsored research spending on state and local taxes, while also important, are significantly smaller than the other impacts. Since the University of Utah is tax exempt, it does not generate either property taxes or sales taxes directly for the state of Utah. However, spending by the University does generate tax revenue indirectly.

Table 1
Economic Impact of Sponsored Research Spending, University of Utah: FY08
Total Research Spending = $365,000,000
(2008 dollars)

	Direct Impacts	Indirect Impacts[1]	Total Impacts	Derived Multiplier[2]
Gross State Product	$268,813,740	$256,443,890	$525,257,630	1.95
Employment	2,920	4,380	7,300	2.50
Earnings	$169,607,470	$140,441,780	$310,049,250	1.83
Taxes – State			$26,726,395	–
Taxes – Local			$4,712,880	–

1 Includes indirect and induced impacts.
2 Derived multiplier shows the relationship between direct impacts and total impacts.
Source: Calculated by BEBR using the RIMS II I-O model with expenditure data provided by the University of Utah.

In 2008, research spending by the University of Utah generated $31.4 million in tax revenue for state and local governments. This includes $26.7 million in state tax revenue and $4.7 million in tax revenue for local governments. Thus, each $1.0 million in sponsored research generates $73,223 in revenue for state government and $12,912 in tax revenue for local governments.

Table 2
Economic Impacts of Sponsored Research Spending Relative to the State of Utah: FY08
(2008 dollars)

	Total Impacts	State of Utah	Impacts as a Share of State
Gross State Product	$525,257,630	$109,777,000,000	.48%
Employment	7,300	1,702,493	.43%
Earnings	$310,049,250	$69,932,630,000	.44%

Source: Impacts calculated by BEBR using the RIMS II I-O model with expenditure data provided by the University of Utah. Gross state product, employment, and earnings for the State of Utah: U.S. Department of Commerce, Bureau of Economic Analysis.

The full economic impacts of sponsored research are summarized in Table 1. Table 2 shows the effects of the direct, indirect, and induced impacts of the University's sponsored research relative to state totals.

Table 3
Economic Impacts Relative to $1.0 Million in Sponsored Research Spending
(2008 dollars)

	Direct Impacts	Indirect Impacts[1]	Total Impacts
Gross State Product	$736,476	$702,586	$1,439,062
Employment	8	12	20
Earnings	$464,678	$384,772	$849,450
Taxes – State			$73,223
Taxes – Local			$12,912

1 Includes indirect and induced impacts.
Source: Calculated by BEBR using the RIMS II I-O model with expenditure data provided by the University of Utah.

The impacts relative to $1.0 million in research spending are summarized in Table 3. Based on our analysis, each $1.0 million in sponsored research spending by the U of U supports 20 jobs in the state with a total wage bill of $849,450, and generates $73,223 in state tax revenue and $12,912 in local tax revenue. The total contribution to GSP is more than $1.4 million.

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Appendix: Terms Used in This Study

Definitions of terms used in this report are presented here in a logical rather than alphabetical order. The economic impact definitions are consistent with those developed by the U.S. Department of Commerce, Bureau of Economic Analysis.

Economic Impact Analysis estimates the economic impacts of expenditures made in a regional economy with money that comes from outside the region. The process of estimating economic impacts falls into three steps: calculation of the direct impacts, the indirect impacts, and the induced impacts.

Direct Impact is the amount of money put into the regional economy through an entity's spending. The direct impacts consider the actual expenditures made on direct payroll and for purchases of goods and services from local suppliers.

Indirect Impacts are changes in local sales, earnings, and employment in industries that supply goods and services to the entity under study.

Induced Impacts are the increased sales that result from household spending of incomes earned by individuals employed directly by the entity under study and by individuals who work for businesses that supply goods and services to the entity under study.

Total Economic Impacts are the sum of the direct, indirect, and induced impacts.

Multipliers capture the size of the secondary effects in a given region, generally as a ratio of the total change in economic activity relative to the direct change.

Measures of Economic Impact

Earnings are the sum of wage and salary disbursements, proprietors' income, directors' fees, and employer contributions for health insurance and other labor income, less personal contributions for social insurance.

Employment/Jobs include full-time and part-time employment that is sustained by local spending. The self-employed and proprietors are also included in the employment totals used in this study.

Gross Product is the value of goods and services produced by labor and property located within a region. It is measured as gross output minus intermediate inputs.

Other Terms Used in This Study

Fiscal Effects are the tax revenues that flow to state and local units of government as a result of taxable purchases.

Sponsored Research means research funded by external entities through a grant or contract that involves a specified statement of work.

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