THE ECONOMIC IMPACT OF UTAH'S PUBLIC RESEARCH UNIVERSITIES

Utah State University
The University of Utah

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UtahState UNIVERSITY

THE UNIVERSITY OF UTAH

The Economic Impact of Utah's Public Research Universities: A Study of the University of Utah and Utah State University in Fiscal Year 2003

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EXECUTIVE SUMMARY

The University of Utah (U of U) and Utah State University (USU) are the largest state institutions of higher education in Utah. During the 2003 academic year, more than 50,000 students were enrolled in courses and programs of study at these universities. Together, Utah's research universities employed more than 25,400 people, paid $1.0 billion in wages and benefits and generated $2.1 billion in revenue.

The U of U and USU also have the distinction of being the only Carnegie-classified public Doctoral/Research Universities in the state of Utah. As such they transmit and create knowledge and also attract hundreds of millions of dollars in research funding each year. These research activities help broaden the existing intellectual, scientific and technological knowledge, not only in Utah but throughout the world.

Utah's research institutions play yet another role as engines of economic growth and development. They generate hundreds of millions of dollars each year from many sources outside the state some of which will be spent in the local economy thereby creating an economic benefit for the residents of Utah. Further, they are indirectly responsible for the economic impacts generated by companies that license university technology.

This study quantifies the economic impacts on the state of Utah that were generated by Utah's research universities during FY 2003. These impacts are measured in three ways. First, the study measures the direct, indirect and induced effects of the universities' payroll and operating expenses that were supported with outside money. A subset of this analysis is the direct, indirect and induced impacts generated by research spending. Second, the study estimated the impacts of state-sponsored construction activities put in place on the U of U and USU campuses in FY 2003. Finally, the study estimates the impact of Utah-based companies that are licensees or spin-offs of universities technologies. The impacts associated with each of these activities (operations and research spending, state-sponsored construction and university spin-offs) are discussed on the following pages.

OPERATIONS AND IMPACT OF OPERATIONS

- Together the U of U and USU generated almost $2.1 billion in revenue from sources both within and outside the state of Utah during FY 2003. Of this, patient services provided by the University of Utah Hospital and Clinics totaled $620.5 million, accounting for almost 30% of the combined budget. State appropriations totaled $351.9 million, or less than 17% of the combined budget.

- Of the resources available to Utah's research universities during FY 2003, 47% ($981.3 million) was "new" money–that is, money from non-local sources. The two largest components of this new money were federal contracts and grants and health services provided to non-resident patients. Together, these two sources of revenue accounted for over half of all new money generated by the universities in FY 2003.

- Dollars generated from outside the state (new money) supported $677 million in university spending within the state of Utah in FY 2003 and directly supported 12,081 jobs at the universities and $413 million of the universities' payroll. Direct purchases of goods and services from local vendors supported with new money totaled $263.8 million.

- The indirect and induced effects of the universities spending included $901.9 million in additional business output, $326.1 million in additional earnings and an additional 11,837 jobs.

- The **total** economic impact (direct, indirect and induced) of *operational spending* supported with out-of-state dollars in FY 2003 amounted to $1.58 billion in business output, $739.1 million in earnings and 23,918 jobs.

- In addition to the employment and income impacts are the fiscal benefits attributable to university operations funded with new money. The fiscal impacts totaled $69.9 million–$59.3 million for the state of Utah and almost $10.6 million for local units of government. Based on this analysis, the state's treasury captured about $170,000 in tax revenues for every $1.0 million in state appropriations to the research universities.

IMPACTS OF STATE-FUNDED CONSTRUCTION

- Apart from the construction undertaken by the universities, the state of Utah also funds construction on both campuses. In FY 2003, the state financed $67.3 million of new construction at the U of U and USU. These expenditures resulted in 1,669 jobs, about $51.3 million in earnings and $158.6 million in business output. Tax impacts included $4.1 million in state tax revenue and $733,225 in tax revenue for local governments.[1]

While the primary mission of both universities is education, research is a significant and defining characteristic of the U of U and USU's operations. In FY 2003, the U of U and USU generated $413.9 million in contracts and grants, most of which was earmarked for research. *The impacts associated with the research spending of Utah's research universities are a subset of the operational spending impacts.*

RESEARCH AND RESEARCH SPENDING IMPACTS

- During FY 2003, the U of U and USU generated $413.9 million in research. Of this, $265 million was spent locally. These dollars directly supported, to some degree, 12,214 jobs at the universities and $195.5 million in payroll. Direct purchases of goods and services from local vendors totaled almost $70 million. Almost 80% of the universities' research dollars come from federal agencies.

[1] In this analysis, we assumed that financing for state-funded construction was generated outside the state of Utah; however, construction is typically treated as an impact-producing activity regardless of funding source because it represents a change in final demand.

- The direct spending generated indirect and induced effects, culminating in an estimated

$345 million of additional business output, $107.3 million in additional earnings and 4,067 additional jobs.

- The **total** economic impact of research-related spending in FY 2003 amounted to $610.3 million in total output ($265.3 million in direct output plus $345 million generated indirectly), $302.7 million in earnings and 16,281 jobs. The tax impacts included $24.3 million in state tax revenue and $4.3 million in revenues for local units of government.

- Based on these impacts, a total of $1.5 million was generated in the Utah economy for every $1 million in research generated by the universities. Likewise, every $1 million in research money supported 39 jobs and $732,000 in income. The impact on the state's treasury was $59,000 for every $1 million in research generated by the U of U and USU.

Technology commercialization is another way that Utah's research universities benefit the Utah economy. Both the University of Utah and Utah State University have a long and successful history of commercializing their technologies. The impacts generated by technology commercialization occur as university spin-offs and technology licensees pay their employees and purchase goods and services from other Utah businesses.

IMPACT OF UNIVERSITY SPIN-OFFS AND TECHNOLOGY LICENSEES

- By 2003, 62 companies located in Utah were either licensing university technology, or could be considered university spin-offs and/or startups based on research initially conducted on campus. These companies *directly* employed 4,941 people and paid $223.2 million in wages and salaries.

- The *induced* impacts of university spin-offs, start-ups and licensees included 8,339 jobs and $244.5 million in additional earnings. When the direct and induced impacts are combined, the total economic impact of university technology transferred into the private sector resulted in a **total** of 13,280 jobs and $467.7 million in earnings. The fiscal impacts included $37.5 million in state tax revenue and $6.7 million in revenue for local units of government.

Exhibit A summarizes the impacts of university operations, state-sponsored construction and university spin-offs. Exhibit B shows the impacts of university research spending (a component of university operational spending) combined with the impacts of university spin-offs.

EXHIBIT A
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
STATE-WIDE IMPACTS
OPERATIONAL SPENDING, CONSTRUCTION AND UNIVERSITY SPIN-OFFS
FY 2003

- 38,867 jobs
- $1.25 billion in earnings
- $2.2 billion in business output
- $101 million in state tax revenues
- $18.0 million in local tax revenues

Note: These totals include research spending impacts.

EXHIBIT B
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
STATE-WIDE IMPACTS
RESEARCH SPENDING AND UNIVERSITY SPIN-OFFS
FY 2003

- 29,561 jobs
- $770.4 million in earnings
- $1.1 billion in business output
- $62 million in state tax revenues
- $11 million in local tax revenues

Note: These impacts are a subset of Exhibit A.

SECTION I
INTRODUCTION

BACKGROUND

Traditionally, the primary mission of a university has been education--providing graduates with the training and skills needed by business and industry. Today, universities are increasingly recognized as engines of economic growth and development. Once evaluated simply on the merit of providing a "public good," tightening state support for higher education combined with public and private stakeholder expectations have forced university administrators to evaluate their institutions using more quantitative measures such as impact analysis, return on investment and increased earnings potential of university graduates.

It is within this environment that the economic contributions of the University of Utah and Utah State University are examined. These flagship research institutions have long been recognized as major suppliers of health and professional educational services in the state of Utah. Their role as providers of a public good is well established. The quantitative impacts of their operations and research are less understood.

In the summer of 2004, the University of Utah (U of U) and Utah State University (USU) commissioned the Bureau of Economic and Business Research (BEBR) to conduct a study to identify the economic impacts of operational and research spending of the U of U and USU on the state of Utah during FY 2003. Apart from the impacts generated by the universities' operational purchases, BEBR also estimated the economic impacts of technology commercialization; that is, the impacts generated by companies that are spin-offs, or licensees of university technology.

In addition to the economic impacts of Utah's research institutions, BEBR has estimated some of the fiscal benefits that accrue to the state of Utah. While this report does not provide an exhaustive estimate of the fiscal impacts, it does provide some basis to evaluate the return the universities make to the state's treasury.

Finally, this study focuses on the economic effects that are most reliably measured. It does not examine the implicit benefits of the universities such as the added value of a university degree or the importance of accessible, high-quality heath care provided by the University of Utah Health Sciences Center. While these implicit benefits are valuable, their measurement was beyond the scope of this report.

SCOPE OF THE STUDY

A traditional economic impact analysis estimates net "new" economic activity that occurs when activities within the local region are financed with money from outside the region. For example, when a firm sells its products to consumers located outside the region, it "imports" money into the region which is then used to pay the expenses of local producers and suppliers. Tourist spending is an example of an activity that generates economic impacts.

In contrast, a local firm providing services to residents within the region represents a redistribution of existing resources and does not increase the region's economic base. Further, money spent outside the region provides little or no economic benefit to the local economy.

In this context, Utah's research universities generate economic impact when the money they receive from sources outside Utah is spent locally. This study measures the impacts of Utah's research institutions in four ways: (1) the impact of operational spending, (2) the impacts of research-related spending–a component of operational spending, (3) the impacts of spin-off companies and companies that were licensing and using university-owned technology in 2003 and (4) the impact of state-sponsored construction put in place on the university campuses.

The scope of the study includes the measurement of impacts in terms of jobs, wages, tax revenue and total dollar impact (business output) that university expenditures generated throughout the state of Utah in FY 2003. These measures include the direct effects of university spending and employment as well as the indirect impacts that are created through the multiplier process. Multiplier effects result when money spent by the universities is respent in the local community by employees and local businesses. BEBR estimated these economic impacts using detailed revenue and spending information for each university and RIMS II–a regional Input-Output model developed by the U.S. Department of Commerce, Bureau of Economic Analysis.

DATA AND METHODOLOGY

The economic impacts generated by university spending as estimated in this study utilized data provided by each university combined with RIMS II--a standard modeling tool used in economic analysis. The economic impacts of technology commercialization were estimated using information provided by spin-off companies and technology licensees, information from secondary sources, and RIMS II.

ESTIMATING THE OPERATIONS IMPACTS

The first step in the data collection process was to estimate how much of each university's annual revenue came from non-local sources. This information was obtained from each institution's FY 2003 annual reports, and through interviews with various university personnel.[1] From these sources, BEBR calculated that portion of each universities' general revenue derived from outside sources. Sources of new revenue used in this report included (1) patient services provided to non-Utah residents, (2) Medicaid and Medicare payments (3) nonresident student tuition and fees, (4) university department sales and service revenue from non-Utah residents (including sales to students), (5) auxiliary service revenue from non-resident students, (6) federal contracts and grants, (7) non-government contracts and grants, and (8) payments to university athletic departments.

[1] Individuals who were interviewed, or provided information used in this study are identified in the Acknowledgments section.

The second step identifying the amount spent for goods and services purchased from local vendors because these are the purchases that create impacts in the local economy. The classification of expenditures, by detailed industry, sorted by location of vendor, was provided by the Office of Government Accounting and Support Services at the University of Utah and by the Controllers Office at Utah State University. These expenditures were sorted by chartfields (U of U) and subcodes (USU) and then sorted by in-state and out-of-state purchases based on zip codes of billing address. Each in-state purchase was matched with vendor names and industry sector codes contained in an Internet Accessible database maintained by the Utah Department of Workforce Services. Vendors were grouped by industry sector codes and were also assigned a code corresponding to one of 60 aggregated industry sectors in the Utah Input-Output Model (I-O Model).

Payments made to vendors with non-Utah zip codes were treated as Utah purchases when the vendor had a significant presence in Utah even though payment was sent to a billing office located outside the state. For example, utility payments sent to facilities located outside Utah were allocated back to Utah on the premise that the workforce needed to provide these services is located here. Likewise, payments sent out of state to large national wholesale suppliers with a physical presence in Utah (local address, telephone number and employees) were treated as a local purchase and classified as a wholesale transaction.

In other instances, local payments were eliminated from the analysis. Reimbursements for out-of-state travel paid to individuals living in Utah were treated as non-local purchases since most of these expenditures would have occurred out of state.

Every effort was made to include only purchases made from Utah vendors and suppliers. Inter-campus transfers and payments were eliminated. Purchases made directly from out-of-state vendors were excluded from the analysis as were direct leakages such as federal taxes and social security contributions.

Apart from purchases from local vendors are the wages and salaries paid to University employees. In this analysis, wage and salary payments to university employees were treated as local spending.

ESTIMATING RESEARCH EXPENDITURE IMPACTS

Conceptually, the methodology used in the research impact analysis was identical to the methodology used in the operational spending analysis. In brief, detailed data by expenditure category was provided by each university. Each expenditure was reviewed to determine whether it occurred within the state of Utah. Purchases made in Utah were assigned an industry code then entered into the appropriate I-O industrial sector for impact analysis.

Overhead is charged on research contracts to help universities cover the costs associated with supporting research activity on campus. In 2003, the research overhead for both institutions totaled $73.5 million. These dollars are not part of the research accounts, but should be added to the spending funded with research monies. Reallocating research overhead to the research spending analysis was done by distributing the $73.5 million across expenditure categories in the same ratio as each university's operational spending occurred.

Research-related employment was provided by each university and includes all university employees who were paid under a research contract in FY 2003. The total has not been converted to a full-time equivalent standard.

ESTIMATING TECHNOLOGY COMMERCIALIZATION IMPACTS

To determine the broader impact of Utah's research universities, BEBR surveyed or contacted by telephone, 73 Utah-based companies identified by the technology transfer offices at the U of U and USU as spin-offs, startups, or licensees of university technology.

Using survey data, combined with information obtained from the Utah Department of Workforce Services, we estimated employment and wages for 62 companies from the initial list. With the direct employment and wages identified, the induced impacts were calculated using direct effect multipliers from the RIMS II Model. The assumption implicit in this analysis is that most of the revenue generated by these companies comes from outside the state.

To accurately reflect the contribution of the research universities while maintaining conservative estimates, we based the econometric analysis on the results of the 62 companies for which we were able to obtain data. The remaining 11 companies were not included in this study. Finally, we did not include companies that might trace their origins to University spin-offs or companies that were licensing, but not using, university technology in 2003.

ESTIMATING FISCAL IMPACTS

The fiscal impact estimates provided in this analysis were derived by quantifying the relationship between earnings and selected state and local taxes collected over the past five years. At the state tax level, BEBR included individual income tax, sales tax, and other miscellaneous taxes. At the local tax level, BEBR included sales tax and other miscellaneous taxes. Expressed as a ratio representing the effective state and local tax rate, this estimate was applied to the total income impact. The effective rate used in this analysis was 9.43%–8.0% state tax ratio and 1.43% local tax ratio.

The fiscal impact estimates presented here are conservative estimates. Using an effective tax rate methodology assumes that state and local taxes are directly related to earnings. While this holds with respect to state income tax and to a lesser degree, sales tax, the relationship between earnings, property tax and corporate income tax is less obvious. Receipts from these two taxes may not increase in direct proportion to increases in earnings. Thus, property tax and corporate income tax were not used in estimating the effective state and local tax ratios.

INPUT-OUT MODELS

Economic multipliers are produced through the use of input-output models (I-O models). These statistical models simultaneously describe the demand and supply relationships between industries by showing the final demand for goods and services and the interindustry transactions required to satisfy that demand. Using the construction industry as an example, an I-O model would identify all industries that provide goods and services to the construction industry. The I-O model also shows the value of goods and services provided by each industry to the construction industry. The model then identifies all the industries that are suppliers to the initial supplying industries. These interactions continue until the value of supplies from all producing sectors that provide goods and services to the direct suppliers of the construction industry have been accounted for. This is called the multiplier effect.[2]

RIMS II MODEL

The economic impact estimates presented in this study utilize a standard tool of regional economic analysis known as the Regional Input-Output Modeling System (RIMS II), developed by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). RIMS II is based on an accounting framework called an I-O (Input-Output) table. For each industry, an I-O table shows the industrial distribution of inputs purchased and outputs sold. A typical I-O table is derived mainly from two data sources: BEA's national I-O table that shows the input and output structure of approximately 500 U.S. industries, and BEA's regional economic accounts that are used to adjust the national I-O table to show a region's industrial structure and trading patterns.[3]

Using RIMS II for impact analysis has several advantages. RIMS II multipliers can be estimated for any region composed of one or more counties, and for any industry or group of industries in the national I-O table. The accessibility of the main data sources for RIMS II keeps the cost of estimating regional multipliers relatively low. Finally, empirical tests show that estimates based on relatively expensive surveys and RIMS II-based estimates are similar in magnitude.[4]

RIMS II provides a way to estimate changes in employment, earnings and output (or business activity) generated by University purchases of goods and services with money received from outside the state of Utah. These changes are referred to as "impacts".

The impact effects are the *net* changes in regional output, earnings and employment that occur when new dollars flow into the region. Changes occur as these new dollars are spent in the local economy and the existing economic base expands.

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[2] Richardson, Harry W.*, Input-Output and Regional Economics*, Redwood Press Limited, Trowbridge, Wiltshire, Great Britain.

[3] A detailed discussion of RIMS II can be accessed electronically at www.bea.doc.gov/bea/regional/rims.

[4] See U.S. Department of Commerce, Regional Input-Out Modeling Systems (RIMS II) chapter 5. Also see Sharon M. Brucker, Steven E. Hastings, and William R. Latham III, "The Variation of Estimated Impacts from Five Regional Input-Output Models," International Regional Science Review 13 (1990): 119-39.

Conceptually, economic impacts fall into three categories: direct, indirect and induced. The total impact of U of U and USU spending includes the direct, indirect and induced economic effects generated by purchases from Utah companies. An explanation of these concepts is provided

here.

> **Direct Economic Effect**. The direct impacts are University purchases of goods and services from local suppliers, construction spending and wages and salaries paid to University employees.
>
> **Indirect Economic Effects.** The indirect impacts are defined as the additional business sales, jobs and income generated by University purchases of goods, services and construction. The portion of University direct spending which goes to Utah suppliers is referred to as the "first round indirect effect" and leads to additional sales at businesses throughout the region which supply parts, materials or services to those first round suppliers. The sum of the first round indirect effects and the subsequent rounds of indirect effects represent the total indirect impact that University purchases have on the Utah economy.
>
> **Induced Economic Effects.** Induced economic effects result when University employees and employees of vendors to the University spend their wages and salaries in Utah.

The **employment impact** includes all jobs (direct, indirect and induced) generated when new money is spent locally. Employment includes all full-time and part-time workers as well as the self-employed.

The **earnings impact** includes wages and salary disbursements, other labor income and proprietors' income.

Business output includes the full (gross) level of business revenue, including costs of materials, costs of labor and net business income, or profits.

SECTION II
UTAH'S RESEARCH UNIVERSITIES
ECONOMIC IMPACTS OF OPERATIONAL SPENDING

OVERVIEW

The University of Utah (U of U) and Utah State University (USU) are the largest state institutions of higher education in Utah. During the 2003 academic year, more than 50,000 students were enrolled in courses and programs of study at these universities. The combined university revenues totaled $2.1 billion, together, these institutions employed more than 25,400 people and paid $1.0 billion in wages and benefits.

The U of U and USU are also the only Carnegie-classified public Doctoral/Research Universities in the state of Utah.[5] As such, they both transmit and create knowledge. In their role as educators, they transmit knowledge by offering professional educational services to thousands of students each year. In their role as knowledge creators, they attract millions of dollars in research each year to fund activities that broaden the existing intellectual, scientific and technological knowledge base.

Utah's research universities play yet another role. They are engines of economic growth and development. By attracting new money into the state and through the commercialization of university-developed technologies, the University of Utah and Utah State University exert a significant and enduring impact on the Utah economy.

REVENUE ANALYSIS

In FY 2003, the combined revenues of the U of U and USU totaled about $2.1 billion. These revenues came from a variety of sources and were used to support the education, training and research activities underway at Utah's research universities. While economic impact of the research universities is driven by their *expenditures* within the state of Utah, the more revenue these universities collect from outside the state, the more they benefit the local economy. If local sources of funding (i.e., state appropriations, resident student tuition, state and local grants) are the primary sources of revenue, then the U of U and USU would simply be recirculating funds throughout the local economy. However, a significant amount of revenue generated by Utah's research universities originates outside the state. As shown in Table 1, the U of U and USU generated almost $2.1 billion in revenues, of which $981.3 million, or 47% came from sources outside the state of Utah.

Patient services provided by the University of Utah Hospital and Clinics accounts for the largest share of the combined universities budget, 40% of which came from services provided to non-resident patients and from federal programs including Medicaid and Medicare.

[5] Doctoral/Research Universities are institutions that offer a wide range of baccalaureate programs and are committed to graduate education by awarding at least 50 or more doctoral degrees each year across at least 15 disciplines. Brigham Young University is the only other Doctoral/Research University in the state of Utah. "Carnegie Classification of Institutions of Higher Education: 2000 edition"; available at www.carnegie-foundation-org.

Revenues originating from other sources outside the state include federal contracts and grants, private gifts and contracts, tuition and fees paid by non-resident students, capital appropriations and sales and services provided to non-resident students and other individuals living outside the state. State appropriations accounted for less than 17% of the FY 2003 combined budget.

TABLE 1
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
SUMMARY OF REVENUE SOURCES: FY 2003

Revenue Source	Combined Revenue	% of Total	Total From Non-local Sources
Patient services	$620,460,000	29.8	$250,375,147
State appropriations	$351,869,756	16.9	$0
Federal contracts, grants and appropriations	$321,443,696	15.5	$321,443,696
Sales and services	$273,849,188	13.2	$169,582,170
Tuition and fees	$155,152,409	7.5	$40,294,266
Auxiliary enterprises	$96,133,680	4.6	$8,255,391
Other revenue	$77,163,798	3.7	$33,452,650
Agency grants and contracts	$73,776,612	3.5	$73,776,612
Private gifts	$64,041,722	3.1	$64,041,722
State and local grants and contracts	$24,624,368	1.2	$0
Capital grants and appropriations	$11,927,103	0.6	$11,927,103
Additions to permanent endowments	$8,159,657	0.4	$8,159,657
Totals	**$2,078,601,989**	**100.0**	**$981,308,414**

Source: Calculated by BEBR using information provided in the FY 2003 Annual Reports from the University of Utah and Utah State University and information obtained through interviews with University of Utah and Utah State University staff.

Table 2 provides a detail of the revenue sources for each university in FY 2003. Exhibit 1 is a comparative analysis of the three largest revenue sources for each university.

As shown in Table 2, the University of Utah generated about $1.7 billion in revenue in FY 2003. University of Utah Hospitals and Clinics (UUHC) generated $620 million, or about 37% of the university's revenue. Roughly 40% of UUHC's revenues came from sources outside Utah. Payments from federal agencies (Medicaid and Medicare) and payments for services provided to non-Utah residents were the primary sources of new money.

Sales and services provided $258.3 million in revenue for the U of U, of which 65% came from non-local sources. This revenue group includes a variety of sales and services including, but not limited to, revenue generated by Associated Regional University Pathologists (ARUP), Red Butte Garden, the university's athletic department, University Bookstore, and University Press.

State appropriations totaled $227.8 million, accounting for just 13.7% of the University's revenues in FY 2003. All of this appropriation is considered to be locally generated.

Sources of "new" revenue for the U of U totaled $796.5 million in FY 2003, or about 48% of all money received by the University that year. In addition to revenue from non-resident patient services and other sales and services to non-residents, federal contracts and grants were a major source of the new monies generated by the University of Utah.

Utah State generated $412.1 million in revenue during FY 2003. The two most important sources of funding for USU were federal and state governments. Federal contracts, grants and appropriations ($130 million) combined with USU's state appropriation ($124 million) accounted for 61% of the university's general revenues in FY 2003. Revenue from tuition and fees provided about 12% of USU's total revenue.

Sources of new revenue for USU totaled $184.2 million, or about 45% of all money generated by the University in FY 2003. Almost all of USU's new money was in the form of federal contracts and grants. These totaled $129.8 million. Other sources of new money included non-resident student tuition ($10.1 million) and agency grants and contracts ($9.4 million).

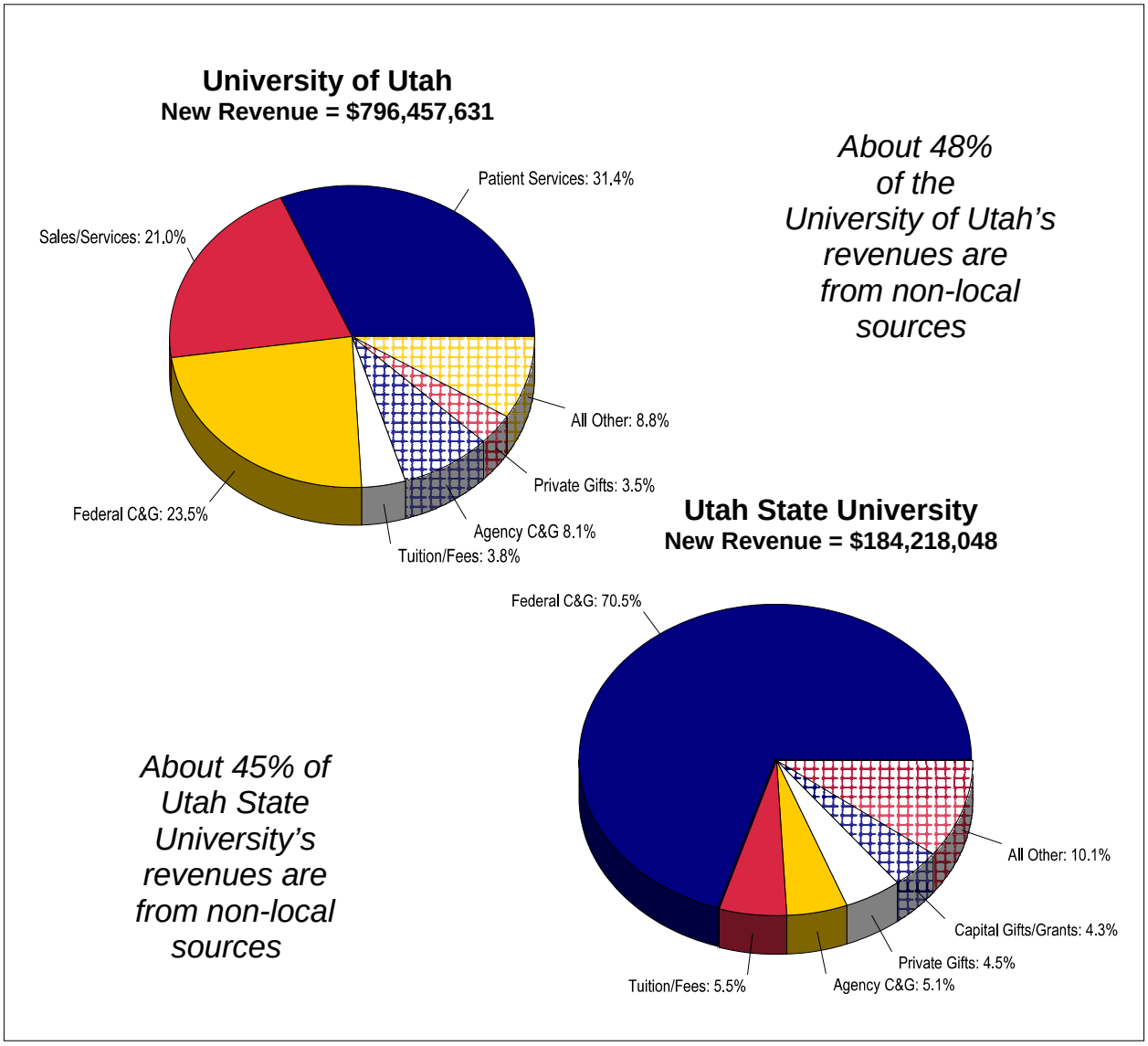
TABLE 2
REVENUE ANALYSIS
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY: FY 2003

UNIVERSITY OF UTAH			UTAH STATE UNIVERSITY		
Revenue Source	**Total Revenue**	**Total from Non-local Sources**	**Revenue Source**	**Total Revenue**	**Total from Non-local Sources**
Patient revenue[1]	$620,460,000	$250,375,147	Federal contracts and grants	$129,819,935	$129,819,935
Sales and services[2]	$258,314,000	$166,918,358	State appropriations	$124,048,756	0
State appropriations[3]	$227,821,000	$0	Tuition and fees	$47,356,409	$10,113,066
Federal contracts and grants	$187,484,000	$187,484,000	Auxiliary enterprises[6]	$32,625,680	$1,126,465
Tuition and fees	$107,796,000	$30,181,200	Sales and services[5]	$15,535,188	$2,663,812
Agency grants and contracts	$64,324,000	$64,324,000	State and local contracts/grants	$14,649,751	0
Auxiliary enterprises[4]	$63,508,000	$7,128,926	Agency grants and contracts	$9,452,612	$9,452,612
Other revenue	$36,028,000	$0	Private gifts	$8,304,180	$8,304,180
Private gifts	$27,482,000	$27,482,000	Other revenue	$7,541,500	0
Investment Income	$27,338,000	$27,338,000	Capital gifts and grants	$7,933,542	$7,933,542
Capital gifts and grants	$20,322,000	$20,322,000	Investment income	$6,114,650	$6,114,650
State and local contracts/grants	$10,749,000	$0	Federal appropriations	$4,139,761	$4,139,761
Capital appropriations	$7,730,000	$7,730,000	Capital appropriations	$3,564,368	$3,564,368
Additions to permanent endowments	$7,174,000	$7,174,000	Additions to permanent endowments	$985,657	$985,657
Total Revenue	**$1,666,530,000**	**$796,357,631**	**Total Revenue**	**$412,071,989**	**$184,218,048**

[1] University of Utah Hospitals and Clinics revenue.
[2] Includes revenue of Associated Regional University Pathologists, University Press, Red Butte Garden, Royalties, and Athletics Department.
[3] Includes approximately $15.0 million of pass-through funding for the Utah Education Network.
[4] Includes revenue from student housing, bookstore and university guest house.
[5] Includes revenues from the Athletics Department, Substitute Teaching Institute, University Press and sale of extension publications.
[6] Includes revenues from the bookstore and residential living.

Sources: University of Utah: revised financial statement provided by Paul Brinkman, Associate Vice President, Office of the Senior Vice President for Academic Affairs and conversations with other university personnel; Utah State University: Financial Report for the year ended June 30, 2003 and conversations with university personnel.

EXHIBIT 1
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
SOURCES OF NEW REVENUE: FY 2003



Source: Calculated by the Bureau of Economic and Business Research using information from the University of Utah and Utah State University.

EXPENDITURE ANALYSIS

As shown in the revenue analysis, Utah's research universities are successfully drawing a sizable portion of their support from outside the state. However, the extent to which they spend their dollars locally ultimately determines the impact they exert on the state's economy. Therefore, this analysis shows how and where the research universities spent their funds in FY 2003.

Utah's research universities employed more than 25,400 people and spent about $1.8 billion in FY 2003 for payroll, and other goods and services. Payroll (wages, salaries and benefits) amounted to $1.0 billion, representing well over half of all university spending during the study year. Of total payroll-related spending, direct compensation (wages and salaries) totaled $831 million. Nearly all university employees reside in Utah, so most of this outlay remains in the state.

Purchases of goods and services (including payroll-related benefits) totaled about $1.0 billion. These purchases included a range of goods and services such as office supplies, utilities, books, repair services, medical services, insurance, capital outlays for equipment, improvements made to existing buildings and new construction. Based on BEBR's analysis of detailed expenditure data provided by the universities, about 51% ($522.6 million) of these purchases were made locally.

Utah's research universities are major contributors to Utah's economic base. They generate almost half of their general revenue from outside the state and spend most of the money locally. When the direct compensation paid to employees is combined with local purchases of goods and services, Utah's research universities pumped $1.35 billion into the Utah economy in FY 2003 (about 73% of all university operational spending). (Table 3)

TABLE 3
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
OPERATIONAL SPENDING ANALYSIS: FY 2003

	Total Spending	Local Purchases	Percentage of Purchases Made Locally
University of Utah	$1,478,937,000	$1,066,723,280	72.1
Utah State University	$372,047,699	$290,839,309	78.2
Totals	**$1,850,984,699**	**$1,357,562,589**	**73.3**

Source: Calculated by the Bureau of Economic and Business Research using expenditure data provided by the University of Utah and Utah State University.

STATE-FUNDED CONSTRUCTION

Apart from the construction activities financed by the universities, the state's building program also funds on-campus construction. The Utah State Division of Facilities and Construction Management (DFCM) administered these funds which totaled almost $67.3 million in FY 2003–$53.7 million at the University of Utah and $13.6 million at Utah State University. The projects funded by the state included both new building construction, space rehabilitation projects and other maintenance construction. Most of the projects are undertaken by Utah-based companies. Although these construction purchases were not made directly by the universities, they are part of the university spending equation, generating impacts that should be attributed to university operations.

ECONOMIC IMPACTS OF OPERATIONAL SPENDING

The impacts of Utah's research universities are the effects of "new" money spent locally. In FY 2003, the U of U and USU spent approximately $1.35 billion in Utah. Of this, out-of-state revenue supported almost $677 million in local spending.

The total impacts of university spending consist of *direct* impacts, *indirect* impacts and *induced* impacts. The direct impacts are the direct payments universities make in Utah that are supported by out-of-state revenue including spending on goods, services, construction and payroll. Indirect impacts are the impacts generated when local vendors from which the universities purchase goods and services spend money in the state. Induced impacts are the impacts created when university employees and the employees of university vendors spend money in the state. Table 4 presents these impacts for each university.

TABLE 4
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
SUMMARY OF EMPLOYMENT, EARNINGS AND BUSINESS OUTPUT IMPACTS: FY 2003

	Direct	Indirect/ Induced	Total
BUSINESS OUTPUT			
University of Utah	$546,788,709	$693,085,889	$1,239,874,598
Utah State University	$130,005,167	$208,823,642	$338,828,809
Total	**$676,793,876**	**$901,909,531**	**$1,578,703,407**
Earnings			
University of Utah	$333,637,044	$264,312,263	$597,949,307
Utah State University	$79,325,741	$61,783,566	$141,109,307
Total	**$412,962,785**	**$326,095,829**	**$739,058,614**
EMPLOYMENT[1]			
University of Utah	9,025	9,610	18,635
Utah State University	3,056	2,227	5,283
Total	**12,081**	**11,837**	**23,918**

[1] Includes full-time and part-time jobs.
Source: Calculated by the Bureau of Economic and Business Research, University of Utah.

EMPLOYMENT AND EARNINGS

Funds originating from outside Utah directly supported 12,081 jobs and $413 million in salaries at the U of U and USU in FY 2003. Indirect and induced impacts generated an additional 11,837 jobs and $326 million in earnings. The employment multiplier (derived by dividing the total economic impact of 23,918 by the direct impact of 12,081) is 1.98. The earnings multiplier is 1.79. These employment impacts include both full-time and part-time jobs.

BUSINESS OUTPUT

Approximately $677 million spent by the U of U and USU in FY 2003 came from non-local sources. These expenditures generated an additional $902 million in indirect and induced business output. When the direct spending is added to the indirect and induced output, Utah's research universities generated a total of $1.57 billion in business output during FY 2003.

FISCAL IMPACTS

Some portion of the money Utah's research universities receive in state support, such as state appropriations, flows back to the state's treasury as a result of economic activity generated by the universities' purchases. Based on the income impacts generated by university purchases the state government realized $59.3 million in tax revenue and local units of government realized approximately $10.6 million. (Table 5) From these revenue estimates, the state's treasury captured at least 17 cents of every state dollar appropriated to Utah's research universities in FY 2003.

TABLE 5
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
SUMMARY OF FISCAL IMPACTS GENERATED FROM OPERATIONS: FY 2003

	State Tax Revenue	Local Tax Revenue	Total Tax Revenue
University of Utah	$48,015,329	$8,550,675	$56,566,004
Utah State University	$11,331,077	$2,017,863	$13,348,940
Total	**$59,346,406**	**$10,568,538**	**$69,914,944**

Source: Calculated by the Bureau of Economic and Business Research, University of Utah.

Table 6 shows the total economic impacts generated by the University of Utah and Utah State University in FY 2003.

TABLE 6
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
SUMMARY OF ECONOMIC AND FISCAL IMPACTS GENERATED BY OPERATIONS: FY 2003

	University of Utah	Utah State University	Total
Jobs	18,635	5,283	23,918
Earnings	$597,949,307	$141,109,307	$739,058,614
Business Output	$1,239,874,598	$338,828,809	$1,578,703,407
State Tax Revenue	$48,015,329	$11,331,077	$59,346,406
Local Tax Revenue	$8,550,675	$2,017,863	$10,568,538

Source: Calculated by the Bureau of Economic and Business Research, University of Utah.

While the impacts shown here are the economic contributions of Utah's research universities during FY 2003, if the proportion of university spending in the local economy and the proportion of revenues generated from outside the state remain at FY 2003 levels, these impacts will continue in subsequent years.

IMPACT OF OPERATIONAL SPENDING RELATIVE TO STATE APPROPRIATIONS

During FY 2003, the state of Utah provided $351.9 million to the research universities in the form of state appropriations. Relative to this level of support, the return to the state is impressive. In FY 2003, every $1.0 million in state appropriation was associated with 68 jobs, $2.1 million in earnings, $4.5 million in business activity and about $169,000 in state tax revenue. These estimates include the direct, indirect and induced impacts of the operational spending by the University of Utah and Utah State University. (Table 7)

TABLE 7
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
ECONOMIC AND FISCAL IMPACTS
RELATIVE TO STATE APPROPRIATIONS: FY 2003

Every $1.0 million in state appropriation was associated with...	
Jobs	68
Earnings	$2.1 million
Business Output	$4.5 million
State Tax Revenue	$168,880

Note: These impacts are based on the University of Utah and Utah State University's local spending for operations and do not include the impacts of state-sponsored construction.
Source: Calculated by the Bureau of Economic and Business Research, University of Utah.

ECONOMIC IMPACT OF STATE-FUNDED CONSTRUCTION

The value of new construction put in place by the Utah State Division of Facilities and Construction Management on the U of U and USU campuses totaled $67.3 million. Although these were projects funded by the state of Utah, in economic analysis construction is generally treated as a change in final demand regardless of funding source. Further, the money used to finance the projects could have been raised through a bonding process or from other sources outside the state. In any case, this analysis has estimated the economic impacts of these construction projects.

State-financed construction of $67.3 million generated $158.6 million in business activity, supported 1,669 jobs and about $51.3 million in earnings in FY 2003. The tax revenue impacts included $4.1 million in state tax revenue and $733,225 in tax revenue for local governments.

Unlike ongoing university impacts, construction impacts are realized only during the course of work. Thus, construction impacts would not continue in subsequent years unless additional construction projects were approved.

Table 8 summarizes the impacts of the universities' operations and state-funded construction in FY 2003.

TABLE 8
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
SUMMARY ECONOMIC AND FISCAL IMPACTS OF
OPERATIONS AND STATE-FUNDED CONSTRUCTION: FY 2003

	Operations	Construction	Total
Jobs	23,918	1,669	25,587
Earnings	$739,058,614	$51,274,481	$790,333,095
Business Output	$1,578,703,407	$158,654,185	$1,737,357,592
State Tax Revenue	$59,346,406	$4,117,340	$63,463,746
Local Tax Revenue	$10,568,538	$733,225	$11,301,763

Source: Calculated by the Bureau of Economic and Business Research, University of Utah.

SECTION III
ECONOMIC IMPACT OF UNIVERSITY RESEARCH SPENDING

Research is a defining characteristic of the University of Utah and Utah State University and sets them apart from other state institutions of higher education. Research activities underway at these two universities are important to the state's economic base in several ways. First, the majority of money used to fund research activities comes from outside the state of Utah, creating new jobs and income for Utah residents. Second, many of the technologies developed through the research process have potential commercial applications leading to the creation of new businesses or expansion of existing ones. Finally, the presence of large academic research complexes attracts related activities such as the Howard Hughes Medical Institute on the University of Utah Campus.

The impacts of the universities' research activities presented here include the direct wages and salaries paid to university employees who worked on research contracts in FY 2003 and direct research-related purchases from local businesses. The impacts also include the indirect and induced effects generated by these direct purchases.

LIMITATIONS OF THE ANALYSIS

Research dollars are prime examples of new money because most of it comes from agencies outside the state, i.e., National Science Foundation, National Institutes of Health and Department of Defense. However, research funding from state and local agencies has also been included in this analysis on the premise that, in the absence of Utah's research universities, a portion of the money would have been spent outside the state through contracts awarded to consultants or institutions located outside Utah. Even if this assumption is not accurate, the change in the economic impacts estimated here would only be slightly lower since research funding provided by state and local agencies represented just 5.5% of total research funding in FY 2003.

Due to data limitations, all contract and grant (C&G) funding is treated as research funding although C&G monies may include non-research contracts. Likewise, research-related visitor impacts, which may be an important source of spending have not been included. Finally, estimates of the research-related employees and students include all faculty, staff and students who were paid on a research project in FY 2003 even though many, if not most of these individuals draw only a portion of their wages and salaries from research contracts. Aside from these limitations, BEBR believes this analysis provides a reasonable measure of the economic importance of the research spending by Utah's research institutions.

RESEARCH FUNDING

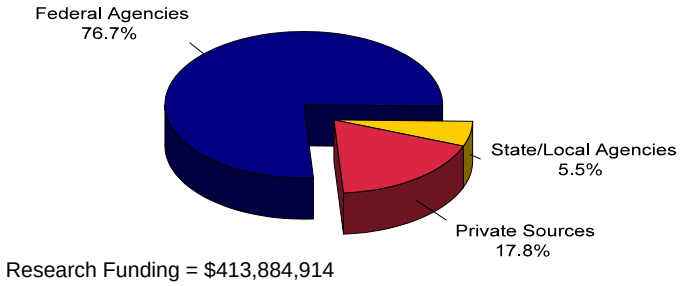
In FY 2003, the University of Utah and Utah State University generated $413.9 million in contracts, grants and awards. While most of the money was earmarked for research programs, included in the total are funds committed for special activities and programs. For purposes of the research impact analysis, all contract, grant and award funding is treated as research funding.

This amount represents funding that was either appropriated or obligated to the universities during the year, not the amount earned or spent.

Contracts and grants generated by the University of Utah totaled about $263 million.

C&G funding at Utah State was $151 million.

Exhibit 2
Sources of Research Funding



Research Funding = $413,884,914

As shown in Exhibit 2 funding from federal agencies accounted for the largest share of contract and grant money (76.6%) followed by agency contracts and private grants (18%). Grants and contracts from state and local government agencies accounted for just 5.5% of all research dollars received in FY 2003.

Table 9 shows the research funding, by source for each institution. In FY 2003, the U of U generated almost $262.6 million in contracts and grants, of which 71% came from federal agencies. In comparison, USU generated $151 million in contracts and grants, but 86% of their funding came from federal agencies.

TABLE 9
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
RESEARCH FUNDING, BY SOURCE: FY 2003

Source	University of Utah	Utah State University	Total	% of Total
Federal Agencies	$187,484,000	$129,819,935	$317,303,935	76.7%
Private Sources	$64,323,400	$9,452,612	$73,776,012	17.8%
State and Local Agencies	$10,749,000	$12,055,367	$22,804,367	5.5%
Totals	**$262,557,000**	**$151,327,914**	**$413,884,914**	**100.0%**

Source: Data provided by the University of Utah and Utah State University.

RESEARCH EXPENDITURES

The combined research-related spending by the U of U and USU in FY2003 was $386.3 million--about 93% of the dollars obligated or appropriated that year. Research grants are frequently awarded for more than one year and any given year's expenditures may include money awarded in the previous year, as well as the current year. Likewise, some of the research dollars awarded in FY 2003 will be spent in future years.

Most research-related spending remains in Utah. Table 10 shows university purchases of goods and services from specific industry sectors in Utah during FY 2003. As shown in Table 9, the University of Utah and Utah State University spent $265.3 million locally through payroll and purchases of goods and services from Utah businesses. This represents 69% of all research spending in FY 2003.

TABLE 10
RESEARCH-RELATED EXPENDITURES: FY 2003
SUMMARY OF LOCAL PURCHASES

Industry Sector	Total	% of Total
Agriculture, forestry and fishing	$59,303	0.22%
Mining	$4,875	0.00%
Utilities	$814,644	0.31%
Construction	$2,395,978	0.91%
Manufacturing	$2,927,314	1.10%
Wholesale trade	$6,475,569	2.44%
Retail trade	$4,435,860	1.67%
Transportation and warehousing	$1,309,854	0.49%
Information, broadcasting, and communications	$2,289,224	0.86%
Finance and insurance	$1,798,322	0.68%
Real estate and rental and leasing	$542,261	0.20%
Professional, scientific, and technical services	$5,765,350	2.17%
Management of companies	$42,937	0.02%
Administrative and waste management services	$2,694,171	1.01%
Educational services	$5,839,367	2.20%
Health care and social assistance	$15,581,551	5.87%
Arts, entertainment, and recreation	$138,799	0.05%
Accommodation and food services	$2,250,755	0.85%
Other services	$7,349,071	2.77%
Royalties, fellowships, licenses	$7,119,590	2.68%
Wages and salaries of non-research employees	$43,564,005	16.4%
Wages and salaries of research employees	$151,943,324	57.3%
Total	**$265,342,722**	**100.0%**

Note: Includes direct operational spending for research projects and overhead distribution.
Source: Calculated by the Bureau of Economic and Business Research, 2004.

The largest expenditure category, accounting for almost 74% of all local spending, was wages and salaries paid to University employees. In FY 2003, a total of $151.9 million was paid to faculty, support staff, and students working on research contracts. An estimated $43.5 million was paid to administrative personnel and supporting staff to cover costs associated with research contracts. In total, an estimated 12,214 employees at the University of Utah and Utah State University were supported to some degree by research contracts.

The remaining $70 million was spent by the universities for purchasing goods and services from Utah businesses, local government agencies and private foundations. Of this, more than $10 million was spent for operational supplies and about $3 million was spent for equipment manufactured in Utah. Research operations also create demand for services in the community. The combined spending for professional, healthcare and educational services totaled almost $28 million. Purchases of information and communication services totaled almost $2.3 million, and about $15 million was spent for a variety of other services.

RESEARCH-RELATED EMPLOYMENT

Estimates of research-related employment were provided by each university. At the University of Utah, these estimates were made by the Office of Budget and Institutional Analysis. At Utah State University, employment estimates were provided by the Office of the Vice President for Research.

Most individuals who are paid under research contracts draw only a portion of their salaries from research projects. The employment estimate used in this analysis includes all individuals who were paid under a research contract during FY 2003, including faculty and staff who were supported exclusively by research contracts, full- and part-time employees who worked on research projects for short periods during the year, and students who were supported by research dollars. No attempt has been made to convert the employment to full-time equivalent. In FY 2003, a total of 10,804 employees at both the U of U and USU received some portion of their pay from research accounts.

In addition to those individuals who were paid directly from a research contract are support staff and administrative personnel paid with research overhead. BEBR estimates this number to be 1,410 University employees.

ECONOMIC IMPACTS OF RESEARCH SPENDING

Economic impacts of research-related activity occur in three ways. First, research grants directly support a large number of faculty and support staff. As these employees spend their money locally, additional jobs and wages are created in other sectors of the economy. Second, jobs and income are created in the economy when the universities' purchase goods and services from local businesses. Finally, the commercialization of technologies developed at Utah's research universities supports and creates jobs throughout the state. The first two categories of impacts were derived from the research-related spending at each university during FY 2003 and are discussed in this section. The third category of impact, technology commercialization, is discussed in detail in the following section.

EMPLOYMENT AND EARNINGS

The impacts generated by university research spending are impressive. Research-related expenditures directly supported 12,214 direct, full- and part-time university jobs, including faculty, administrators, academic professionals and supporting staff positions. Direct wages and salaries paid to these individuals totaled $195.5 million. Indirect and induced employment impacts totaled 4,067 jobs and $107.3 million in income. Thus, the total employment impact (university employees and all jobs created by university research spending) was 16,281. The earnings impact totaled $302.8 million (direct impact of $195.5 million and $107.3 million generated through the multiplier process).

It is important to note that only a small portion of these economic impacts are the result of state-funded contracts and grants. Rather, the jobs and associated wages and sales reflect the universities' ability to attract grants and awards from sources other than taxpayer supported funding.

BUSINESS OUTPUT AND FISCAL IMPACTS

The $265.3 million in direct output supported by research contracts led to an additional $345 million in business output, for a total output impact of $610.3 million. The tax impacts included $24.3 million in state tax revenue and $4.3 million in tax revenue for local governments. (Tables 11 and 12)

TABLE 11
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
ECONOMIC IMPACTS OF RESEARCH SPENDING: FY 2003

	Direct	Indirect/ Induced	Total
Business Output			
University of Utah	$178,521,420	$211,721,459	$390,242,879
Utah State	$86,821,202	$133,250,750	$220,071,952
Total	**$265,342,622**	**$344,972,209**	**$610,314,831**
Earnings			
University of Utah	$133,898,549	$67,110,495	$201,009,044
Utah State	$61,608,780	$40,165,872	$101,774,652
Total	**$195,507,329**	**$107,276,367**	**$302,783,696**
Employment[1]			
University of Utah	6,573	2,554	9,127
Utah State	5,641	1,513	7,154
Total	**12,214**	**4,067**	**16,281**

[1] Includes full-time and part-time jobs.
Source: Calculated by the Bureau of Economic and Business Research, University of Utah.

TABLE 12
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
SUMMARY OF FISCAL IMPACTS GENERATED FROM RESEARCH SPENDING: FY 2003

	State Tax Revenue	Local Tax Revenue	Total Tax Revenue
University of Utah	$16,141,026	$2,874,429	$19,015,455
Utah State University	$8,172,504	$1,455,377	$9,628,771
Total	**$24,313,530**	**$4,329,806**	**$28,644,226**

Source: Calculated by the Bureau of Economic and Business Research, University of Utah.

Table 13 summarizes all economic impacts generated by research spending at the University of Utah and Utah State University in FY 2003.

TABLE 13
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
SUMMARY OF ECONOMIC AND FISCAL IMPACTS GENERATED FROM RESEARCH SPENDING: FY 2003

	University of Utah	Utah State University	Total
Jobs	9,127	7,154	16,281
Earnings	$201,009,044	$101,774,652	$302,783,696
Business Output	$390,242,879	$220,071,952	$610,314,831
State Tax Revenue	$16,141,026	$8,172,504	$19,015,455
Local Tax Revenue	$2,874,429	$1,455,377	$9,628,771

Source: Calculated by the Bureau of Economic and Business Research, University of Utah.

Based on these impact estimates, each $1.0 million in research contracts received by the U of U and USU generated $1.5 million in business sales, $732,000 in earnings and created 39 jobs throughout the state. The impact on the state's treasury was $59,000 for every $1.0 million generated. (Table 14)

TABLE 14
IMPACT OF $1.0 MILLION OF RESEARCH CONTRACTS

Every $1.0 million in research generated	
Jobs	39
Income	$732,000
Business Output	$1,500,000
State Tax Revenue	$59,000

Note: These impacts are a component of operational spending presented in Table 7.
Source: Calculated by the Bureau of Economic and Business Research, University of Utah.

SECTION IV
TECHNOLOGY COMMERCIALIZATION

While research and operational spending are the most easily measurable sources of economic impact within the state, they are just two of many ways in which university research affects the local economy. Another important effect is the transfer of technology from university departments and labs to the private sector. Using a variety of technology transfer models, Utah's research universities collaborate directly with both large and small businesses to commercialize products and processes developed in research. University technology transfer offices license new technologies initially developed through university research to established businesses and local start-up companies. Faculty members lend their expertise to local area companies, government agencies and non-profit organizations. Some faculty members set up companies themselves to commercialize the knowledge they initially developed while at the university. These companies are part of the state's economic base, and their economic contributions are part of the university impact story.

In a 2001 report, the National Association of State Universities and Land-Grant Colleges stated that such university spin-offs and start-up companies are a boon to local economic growth because the majority locate near the institution that produced the knowledge they are using.[5] Further, the National Governors' Association said in a recent report, "during a thirty-year period, universities have increased the volume of their research nearly ten-fold and the volume of their formal technology transfer through patenting and licensing has more than doubled in the past six years". The study concluded that, "Universities can play a major role in economic development, and university industry technology transfer can be a stimulant, precursor, or complement to building a high-skills, high-wage state economy."[6]

TECHNOLOGY TRANSFER AT UTAH'S RESEARCH UNIVERSITIES

Both of Utah's research universities have active technology transfer offices with similar functions. The primary mission of these offices is to facilitate the commercialization of scientific and technical research findings through evaluation, management, protection and licensing of university intellectual property. This process may include licensing a university-developed technology to an existing, established business, or encouraging interested faculty members in commercializing their own technologies. Companies founded by faculty members may be either start-up companies based on licensed university technologies or spin-off companies--companies started by faculty members that rely on non-patented technology and expertise.

Linkages with the business community augment the economic benefits generated by Utah's research universities. However, the process of estimating the economic impact associated with technology development and innovation emerging from universities is one of the most difficult aspects of capturing the real return of investing in higher education.

[5] "Shaping the Future: The Economic Impact of Public Universities", National Association of State Universities and Land Grant Colleges, Office of Public Affairs, Washington D.C., August 2001, p 1.

[6] "Building State Economies by Promoting University-Industry Technology Transfer", National Governors' Association, Washington D.C., 2000, p 7.

Utah's research universities have a significant impact on the local economy through the creation and growth of knowledge intensive, innovation-based companies in the regions surrounding them. Formal and informal technology transfer through the research universities creates start-up and spin-off companies that impact the economy by creating jobs (often highly paid positions which attract experts in their field) and by generating tax dollars. In addition, these companies tend to cluster around the research university acting as magnets for other companies. The reason for this is clear: knowledge-intensive industry cannot exist without the steady supply of educated workers, ideas and innovation provided by Utah's research universities.

In 2003, 62 Utah-based companies were either licensing university technology or could trace their roots to university research.

As shown in Table 15, both universities have a legacy of spin-off companies dating from the late 1960s with the formation of companies such as Evans & Sutherland and Hyclone Labs. Over the past four decades both universities have successfully transferred technologies into the private sector expanding the state's economy through the creation of new jobs and income for Utah's residents.

The presence of these companies underscores an important aspect of the role that Utah's research universities play in the economic development process; namely that they create economic value over the term. While the current research activities of the universities may not have directly influenced any of the companies included in our analysis during 2003, at some point, the presence of the universities was integral to success. The upshot is ***seeds of research sown today will be fruit harvested in the future.***

In 2003, there were at least 62 active companies in Utah that were either licensing university technologies or could trace their roots to university research. These businesses ranged in size from one person operations to companies employing more than 1,000 people. The technologies under development at these firms also represent a wide range, including biomedical research, food services and waste management technologies. More than half (56%) of the companies in the analysis were in the Professional, Scientific, and Technical Services sector and about 14% were classified as Computer and Electronic Manufacturing.

TABLE 15
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY: SPIN-OFFS AND TECHNOLOGY LICENSEES

UNIVERSITY OF UTAH

Company	Relationship to University	Year Founded	Company	Relationship to University	Year Founded
Aciont, Inc.	Spinoff/Startup	2000	MacroMed, Inc.	Spinoff/Startup	1995
Amirsys, Inc.	Spinoff/Startup	2001	MedQuest Products, Inc.	Spinoff/Startup	1993
ARUP	Spinoff/Startup	1984	Medtronic Gastro/URO	Spinoff/Startup	1976
Attensity Corporation	Spinoff/Startup	2000	Mineral Technologies	Spinoff/Startup	1997
Cephalon[1]	Spinoff/Startup	1987	Myriad Genetics	Spinoff/Startup	1991
Ceramatec, Inc.	Spinoff/Startup	1976	NPS Pharmaceuticals	Spinoff/Startup	1983
Cimarron Software	Spinoff/Startup	1995	Pharmanex	Licensee	NA
Cognetix	Spinoff/Startup	1996	PartNet	Spinoff/Startup	1993
Cyber Kinetics, Inc.[2]	Spinoff/Startup	2002	Parvus Corp.	Licensee	NA
Darbick Instructional Software	Spinoff/Startup	1994	Pharmadigm, Inc.	Spinoff/Startup	1991
DataChem Laboratories	Spinoff/Startup	1971	PostNova Analytics, Inc.	Spinoff/Startup	1997
Diacor	Spinoff/Startup	1983	Process Instruments, Inc.	Licensee	NA
Echelon Biosciences, Inc.	Licensee	NA	Rocky Mountain Research, Inc.	Spinoff/Startup	1985
ENECO	Licensee	NA	Sarcos	Spinoff/Startup	1987
Engineering Geometry Systems	Spinoff/Startup	1988	Signature Immunologics	Spinoff/Startup	1996
ErgoWeb, Inc.	Spinoff/Startup	1995	Theradoc, Inc.	Spinoff/Startup	1999
Evans & Sutherland, Inc.	Spinoff/Startup	1968	Techniscan	Spinoff/Startup	1984
FemtoScan	Spinoff/Startup	1990	Terra Tek, Inc.	Spinoff/Startup	1970
Fiore Automation	Spinoff/Startup	1998	Tramontane, Inc.	Spinoff/Startup	2000
Genta[3]	Spinoff/Startup	1988	Universe Partners, Inc.	Spinoff/Startup	1999
Idaho Technology	Licensee	1990	Viewpoint Manufacturing	Licensee	1993
Innovative Caregiving Resources	Spinoff/Startup	1993	Visual Influence	Spinoff/Startup	2001
Iomed	Spinoff/Startup	1983	Watson Pharmaceuticals	Spinoff/Startup	1984
Korr Medical	Spinoff/Startup	1993	Zars, Inc.	Spinoff/Startup	1996

Table 15 continued

UTAH STATE UNIVERSITY

Company	Relationship to University	Year Founded	Company	Relationship to University	Year Founded
3GB	Spinoff/Startup	1998	Hyclone Laboratories	Spinoff/Startup	1967
Autonomous Solutions, Inc	Spinoff/Startup	2000	Intech 180	Spinoff/Startup	1990
Baicor	Spinoff/Startup	1989	Juniper Systems	Spinoff/Startup	1993
Campbell Scientific	Spinoff/Startup	1974	PHYTOKinetics, Inc.	Spinoff/Startup	1994
CyberSym Technologies	Spinoff/Startup	1995	Sorenson Media	Licensee	NA
Frontier Scientific	Spinoff/Startup	1974	Visionary Products	Spinoff/Startup	1996
Heart-to-Heart Foods	Licensee	NA	Wescor	Spinoff/Startup	1970

[1] Was Anesta Corporation.
[2] Was Bionic Technologies, Inc.
[3] Was Salus Therapeutics, Inc.
Source: Bureau of Economic and Business Research, University of Utah; Technology Transfer Office, University of Utah; Technology Commercialization Office, Utah State University.

IMPACTS OF UNIVERSITY SPIN-OFFS AND TECHNOLOGY LICENSEES

The direct impact of spin-off companies includes the employment and wages paid to individuals working for those companies. The indirect impacts include the multiplier effects of the companies' local purchases. In this analysis, BEBR assumed that the revenue used to make those purchases was exogenous.

In 2003, the companies included in this analysis directly employed 4,941 people and paid about $223.2 million in wages and salaries. Added to this direct employment were 8,339 jobs created by induced consumer spending, bringing the statewide total employment impact to 13,280 jobs.

These induced effects added about $244.5 million in additional earnings for a total earnings impact of almost $468 million. The tax impacts included $37.5 million for the state's treasury and $6.7 million for local units of government. Table 16 summarizes the economic impacts of university spin-off/start-ups and licensees in 2003.

TABLE 16
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
IMPACT OF TECHNOLOGY COMMERCIALIZATION: 2003
(dollars in millions)

Number of Companies = 62

	Direct	Induced	Total
Jobs	4,941	8,339	13,280
Earnings	$223.2	$244.5	$467.7
State Tax Revenue	$17.9	$19.6	$37.5
Local Tax Revenue	$3.2	$3.5	$6.7

Source: Calculated by the Bureau of Economic and Business Research, University of Utah.

CONCLUSION

Estimations of the economic impacts resulting from technology commercialization are at best vague, and likely incomplete. For example, we have no estimates of the impact of companies for which the existence and reputation of Utah's research universities played a key role in their decision to locate and/or expand in Utah. Nor can we reasonably quantify the technological advances attributable to university research. It is clear, however, that the contributions of technology commercialization are significant and enduring. As the knowledge-intensive, innovation-based environment of the modern economy continues to grow, research universities and the technologies they develop can only increase in importance as engines of economic stability and growth.

SECTION V
IMPACT SUMMARY

The economic significance of Utah's research universities goes far beyond their role as a major industry in themselves. The services they provide are vital to the continued growth and development of a wide range of other industries–from information and biomedical technologies to finance and the arts–on which the state's economic future depends.

In addition to their role in education and training, Utah's research institutions create knowledge, are sources of innovation and generate economic development. Research universities can be powerful engines for economic stability and growth. This study has shown that Utah's research universities make large and important economic contributions to Utah's economy.

Each year the University of Utah and Utah State University generate hundreds of millions of dollars in new money for the state of Utah. These dollars, spent locally, increase business activity, and create jobs for Utah's residents. Ultimately, state and local units of government also reap the benefits of the increased economic activity through new tax revenues. In addition to the ongoing impacts generated by operations, Utah's research universities make long-term contributions to the state's economy through the transfer and commercialization of technology from university labs to the private sector.

IMPACTS OF OPERATIONS, CONSTRUCTION AND UNIVERSITY SPIN-OFFS

Broadly defined, the total impact of Utah's research institutions in FY 2003 is the sum of impacts generated by (1) operational spending (which includes the impacts of research-related spending), (2) state-financed construction and (3) technology commercialization. These impacts are summarized in Exhibit 3.

EXHIBIT 3
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
STATE-WIDE IMPACTS
OPERATIONS, CONSTRUCTION AND UNIVERSITY SPIN-OFFS
FY 2003

- 38,867 jobs
- $1.25 billion in earnings
- $2.2 billion in business output
- $101 million in tax revenues to the state of Utah
- $18.0 million in local tax revenues

Note: These numbers include research spending impacts.

As this analysis has shown, the contributions made by the University of Utah and Utah State University are significant. In total, $2.2 billion in business output and almost 39,000 jobs were either directly supported by university spending in FY 2003, or the result of university technology commercialization. These impacts are conservative as they only account for "new" money generated by the universities.

IMPACTS OF RESEARCH SPENDING AND UNIVERSITY SPIN-OFFS

A subset of the operations impact analysis are the impacts generated by research-related spending at University of Utah and Utah State University. In FY 2003, Utah's research universities generated $413.9 million for research and sponsored programs. Seventy-seven percent of that came from the federal government, just 5.5% was provided by state and local agencies. The vast majority of research funding is provided by sources outside the state. Impacts are generated as the universities spend these dollars in Utah. In FY 2003, research-related spending generated $600 million in business activity and supported more than 16,000 jobs. Thus, every $1 million the universities generate in research funding supports 39 jobs within the state of Utah.

Another way that research undertaken by the University of Utah and Utah State University impacts the state's economy is through the technology transfer process. Since the late 1960s, Utah's research universities have encouraged the commercialization of university-developed technology. The companies that license these technologies generate substantial economic benefit to the state. In 2003, spin-offs and licensees of university technology accounted for 13,300 jobs and $468 million in wages.

Exhibit 4 summarizes the impacts of direct research spending and the commercialization of university technologies. In FY 2003, research-related economic impacts accounted for $1.1 billion in business activity and supported almost 30,000 jobs throughout the state.
Clearly, the research programs underway at the University of Utah and Utah State University are an important source of economic growth for the Utah economy.

EXHIBIT 4
UNIVERSITY OF UTAH AND UTAH STATE UNIVERSITY
STATE-WIDE IMPACTS
RESEARCH SPENDING AND UNIVERSITY SPIN-OFFS
FY 2003

- 29,561
- $770.5 million in earnings
- $1.1 billion in business output
- $62 million in tax revenues to the state of Utah
- $11 million in local tax revenues

Note: These impacts are a subset of those presented in Exhibit 3.