



# A Study of the Economic Impact of the University of Oregon



Prepared by Larry Singell, Ph.D.



UNIVERSITY OF OREGON

2002

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# I. Introduction

## Background

This report was prepared by Larry Singell, a Ph.D. economist in the economics department at the University of Oregon, at the request of Janet Fratella, Director of Outreach Projects at the University of Oregon, and was conducted under the supervision of Joe Stone and Philip Romero, the respective deans of arts and sciences and business at the University of Oregon. The primary focus of this study is to estimate the economic impact of the University of Oregon (UO) on the state of Oregon. The analysis does not break down the impact of the university into smaller economic units, such as Lane County or the cities of Eugene and Springfield, although the economic benefits of the state implicitly include these local benefits.

In addition, the analysis considers some of the fiscal benefits to the state of Oregon that directly result from the economic impact of the UO on the state. In particular, the report considers how the revenues and income generated by the UO may affect the state's income tax base and its tax revenue collections. However, the report does not attempt to provide an exhaustive consideration of the UO's fiscal impacts. Nonetheless, the fiscal impact estimates provide some basis to evaluate the return earned by Oregon taxpayers on their investment in the university.

Finally, the report also examines some of the implicit or indirect benefits of the UO on the state. Some of these implicit benefits can be directly quantified, such as the value added of a UO degree relative to that of a high school diploma and its impact on state income tax revenue. However, the monetary value to the state of other UO programs such as the Oregon Bach Festival cannot be readily quantified. Nonetheless, the report details some of the UO's relatively important implicit benefits to provide a more complete picture of the economic impact of the university.

## Scope of Work

To prepare the report, Professor Singell combined data provided by the university with standard economic techniques used to evaluate the economic impact of an institution.

Financial, employment, and student data were collected from the university, including information on purchases, payroll, research grants, employment, tuition, and enrollment. These data were combined with noneconomic data such as volunteer activity, career center programs, and UO cultural events to provide a more holistic view of the institution. The analysis is conducted with data from 2000–2001 or 2001–2, the most recent academic years.

The analysis not only considers the direct effect of UO expenditures and jobs on the Oregon economy, but also estimates the indirect impact of the UO through expenditure and job multiplier effects. Multiplier effects result from the fact that money spent by the University is spent again by employees and local businesses. The result is that an original expenditure by the UO may cycle through the state's economy several times. The analysis is careful to note the assumptions of the analysis and to adopt a conservative approach such that the estimates generally offer a lower bound for the economic impact.

## Summary of Key Findings

### Revenues and Out-of-State Funding

The UO generated over \$351 million in revenues in 2000–2001. Excluding the \$71 million in state appropriations, the university still ranks among the top thirty revenue-generating private enterprises in the state according to the *2002 Power Book of Oregon Business*. While the UO receives significant state support, the university is a good investment for Oregon taxpayers because it is able to draw the vast majority of its revenue from sources outside the state. In fact, state appropriations and in-state tuition accounted for less than 32 percent of UO revenues in 2001, while federal grants and tuition charged to nonresident students accounted for over 35 percent of revenues in the same year. Moreover, 63 percent of in-state students receive federally subsidized grants and loans. Thus, acquiring a college education provides Oregonians access to federal funds, while improving the human resources of the state.

### Research at the UO

Research and sponsored programs received nearly \$58 million in grants and contracts in the 2000–2001 fiscal year, with 82.3 percent of the funding from the federal government and only 7 percent accounted for by state agencies. The vast majority of research funding by the university is provided by sources outside the state.

Federal funding was provided by numerous agencies, including the Department of Health and Human Services (DHHS) (37.8 percent), the Department of Education (28.2 percent), and the National Science Foundation (19.9 percent). Research at the UO is conducted in a diverse set of areas that yield a broad impact on the state. Preliminary figures indicate research expenditures will reach \$75 million for the fiscal year 2001–2, another record high for the UO. For the first time in history, sponsored research expenditures supported by competitively awarded grants and contracts are likely to surpass state appropriations for all purposes. In addition, for each \$1 million in research outlays, the U.S. Department of Commerce indicates that forty-seven jobs are supported in Oregon.

### Expenditures and In-State Outlays

The UO is a major employer and purchaser of goods and services in Oregon, spending over \$336 million in 2000–2001, with an additional estimated \$145 million in off-campus expenditures by UO students. Although the UO generates a majority of its revenue from outside the state, the vast majority of university expenditures take place within the state. For example, 64 percent of the purchases are from vendors who have their headquarters in Oregon. Moreover, because most vendors whose headquarters are outside the state (e.g., U.S. Postal Service) employ a significant number of workers in the state, the fraction of vendors who have headquarters in the state significantly understates the fraction of the revenue that remains in Oregon. In addition, the UO has made it a priority to support small business in the state. This is reflected in the fact that 95 percent of its vendors and 30 percent of its total expenditures are conducted with firms whose contracts are less than \$25,000. The university is also building for the future, having averaged \$15 million in construction projects over the past five years, and there are also a number of multimillion dollar

projects under way, such as the Autzen Stadium expansion and the Lillis Business center. Thus, the UO is, and will continue to be, a major contributor to the Oregon economy.

The UO employs over 3,759 full-time equivalent workers, which excludes the over 2,700 undergraduate workers that are employed on a part-time basis on campus. This ranks the UO as the eighteenth largest employer in the state. The primary role of the university is providing education, and 39 percent of its employees are faculty and administrators. Nonetheless, the UO offers a diverse set of jobs for workers with a variety of skills, which is reflected in the fact that over a third of its employees work in clerical, technical, skilled craft, service, or maintenance positions. The number of employees at the UO may actually significantly understate the impact of UO employment on the state because there are several hundred retired UO employees residing in the state at any given point in time.

The UO pays nearly a quarter of a billion dollars in wages and salaries, which accounts for nearly 80 percent of its expenditures. Because these workers reside in the state, this ensures that most of the UO outlays remain in Oregon. Moreover, the UO is one of the most stable employers in Oregon because student demand for higher education is relatively unresponsive to economic shocks and because much of the UO's funding sources reside outside the state. Thus, the UO is one of the major employers in the state and, given the increasing demand for a college education and the growing enrollment at the UO, is an important engine for economic growth in Oregon.

### **Expenditure and Job Multiplier Effects**

The effect of the \$351 million in direct expenditures and the 3,759 jobs generated by the UO in 2000–2001 is likely to be a significant understatement of the economic impact of the university on the state because it excludes the indirect or multiplier effects of these outlays. Using well-established measures of the expenditure and job multipliers that have been estimated using university-specific data, UO expenditures are predicted to generate a total of \$703 million in direct and indirect expenditures, and UO employment is predicted to generate a total of 8,071 direct and indirect jobs. To put it another way, for every \$1 in state appropriations for the university, the UO generates nearly \$10 in additional expenditures, while UO employment accounts for nearly 7 percent of the total Eugene-Springfield work force and almost 0.7 percent of the total state employment.

Moreover, based on the marginal tax rates in Oregon, these state expenditures can be expected to generate at least \$16 million in additional tax revenue through increases in the statewide income tax base. Thus, the UO has a large economic and fiscal impact on the state.

### **Value Added of a UO Degree**

Universities have a number of implicit benefits that are unique to higher education and that may actually yield a larger impact on a state's economy than their explicit benefits. First, the university's primary function is to produce human capital, which raises the productivity of the work force and the tax base of the state. Based on data for the wage differential between college and high school graduates in the U.S., the number of graduates from the UO in 2001 who are expected to remain in-state, and the marginal tax rate, the estimated increase in the present value of income tax revenue for a single graduating class from the UO over their collective careers is over \$121 million annually. This is a conservative estimate because it includes only graduates from the UO and not the approximate third of UO enrollees who obtain some college but do not earn a degree. Moreover, it also excludes other tax sources that increase with income, such as property taxes. Nonetheless, based solely on the value added of a UO degree, Oregon taxpayers receive

\$1.60 in tax revenue for every \$1 invested in UO college students, which is four and a half times larger than the average return on equities in the stock market over the last fifty years.

### **Stimulus for Business, Job Creation, and Research**

A university's impact on productivity in a state is greater than the simple direct increase in the average wage of university students, because higher education also has a synergistic relationship with business that creates jobs, attracts firms, and matches employers with employees. For example, Phil Knight, the CEO of Nike, is one of numerous examples of a UO education being combined with entrepreneurial ability to produce successful businesses that employ thousands of people and generate billions of dollars in revenue. The presence of a research university such as the UO in a state is critical in keeping bright, energetic entrepreneurs and providing them the intellectual capital to be successful in today's high-skill, high-technology economy. The UO has actively facilitated the synergy between research and business. For example, the Riverfront Research Park was opened in 1993 in order to attract and promote the growth of knowledge-based businesses by explicitly encouraging collaboration with the extensive research capabilities of the UO in a state-of-the-art facility proximate to the university. Moreover, the Office of Technology Transfer was opened in 1992 to guide university inventions through the transition from campus to the commercial marketplace. This process has yielded sixty-one patents, fifty-three license options, and thirteen start-up companies in a little less than ten years.

Higher education also plays a critical role in attracting high paying jobs to Oregon from established firms. In particular, access to human capital has become as important in the twenty-first century as access to raw materials and physical capital was in the previous century. In fact, many employers rank availability to a highly skilled pool of workers as the most important factor in their location decision for a new facility. Finally, the UO Career Center helps facilitate the match between employers and graduates through organizing job fairs and company presentations on campus. In 2001–2, there were eighty-eight on-campus presentations by companies and organizations, 201 interview schedule requests, and a total of 1,462 interviews conducted on campus. Thus, the UO plays a critical role in the creation of jobs through innovation, the attraction of jobs through stocking the pool of highly-skilled workers, and by working as a matchmaker between employers and employees.

### **Volunteer and Community Service Programs**

The UO is a major contributor to the state through its volunteer, internship, and community service programs, many of which are part of the university curriculum and are required in order for students to complete a degree. The university has a diverse set of volunteer programs. For example, the College of Education student teacher program placed 151 student teachers in Oregon classrooms, the Pro Bono Program in the School of Law logged 3,190 legal service hours to low income clients, the Opportunity Planning Team Program annually develops twenty strategic business plans for Northwest companies, and the Rural Environments Program in the School of Architecture and Allied Arts annually conducts ten community planning projects. Although UO students do not charge for their services, the market value of these programs is estimated to be \$2.2 million a year. This does not include the numerous internship programs conducted by most of the major departments on campus. For example, in 2000–2001, a new course offered by the economics department has economics majors work with nonprofit organizations to conduct a cost-benefit analysis of competing projects to help them make the best use of their limited funds. A long-running course by the sociology department has students work three to twenty hours in social services agencies. Moreover, the university also builds and enriches the community through the performance of its students and faculty and by sponsoring many cultural programs such as the Oregon Bach Festival that



attracts 30,000 people to the Eugene-Springfield area. Thus, the UO plays a vital role in developing and maintaining a sense of community in the state.

## II. University of Oregon Revenue

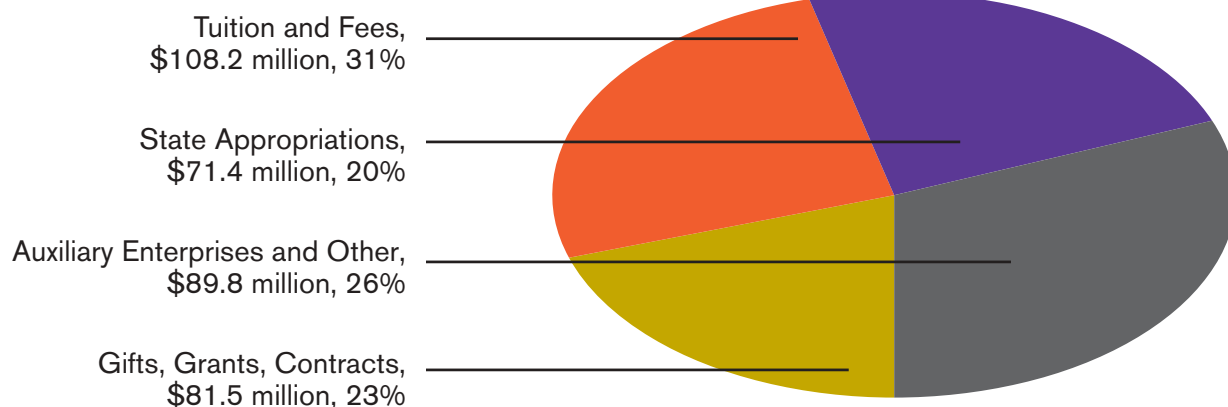
The UO accounted for over \$351 million in restricted and unrestricted revenues in the 2000–2001 academic year, which includes \$71 million in state appropriations. Even in the absence of state support, UO revenues would place it among the top thirty revenue-generating private enterprises in the state according to the *2002 Power Book of Oregon Business*. Thus, the UO plays an important role in the state economy. Nonetheless, because the UO is publicly supported, whether the UO is a good investment for Oregon taxpayers depends on its ability to draw funds from outside the state. Specifically, revenue from out-of-state sources yields expenditures on goods and services provided by, but not funded by, Oregonians. Thus, the benefit of the UO on the state depends, in part, on its ability to generate revenue from outside the state. The subsequent section details the various UO revenue sources, paying particular attention to those that are derived from out of state.

### Sources of University Revenue

Figure 1 indicates that state appropriations accounted for 20 percent of general revenues, which is one of the lowest percentage rates of support for a state public university in the U.S. For example, the University of California, Berkeley and the University of Washington received 39 and 24 percent of their revenues from the state government, respectively. Thus, the UO is relatively less dependent on state government support than other competing institutions in the region.

**FIGURE 1: 2000–2001 TOTAL CURRENT FUNDS**

#### WHERE THE FUNDS WENT



A significant fraction of the revenue generated by the UO is from outside the state. The federal government is the primary source of gifts, grants, and contracts, which accounts for 23 percent of general revenues. Tuition and fees are the largest single revenue category, accounting for 31 percent of unrestricted revenues. Tuition and fees are also an important source of out-of-state revenue. Specifically, out-of-state students account for 32 percent of the student body, and yield more than half of the tuition and fees. Finally, the UO receives 26 percent of its funding from auxiliary enterprises and other sources of funding, which include out-of-state students living in student housing and the nearly 8,000 out-of-state visitors to UO football games. The remaining part of this section details some of the out-of-state revenue sources.

# Out-of-State Revenue Sources

## Research Support

Research and sponsored programs received nearly \$58 million in grants and contracts in the 2000–2001 fiscal year. Table 1 below shows that most of the research support received by the UO is provided by the federal government. Specifically, direct federal and subfederal funding accounts for 82.3 percent of the total dollars awarded, which totaled over \$47.5 million in 2000–2001. In addition, private foundations and corporations provided \$2.5 million in support of research and sponsored programs. State support accounted for \$4 million, or 7 percent, of the research funding received by the UO. Thus, the vast majority of university research funding is provided by sources outside the state.

**TABLE 1: GRANTS, CONTRACTS, AND AWARDS TO UO BY SOURCE**

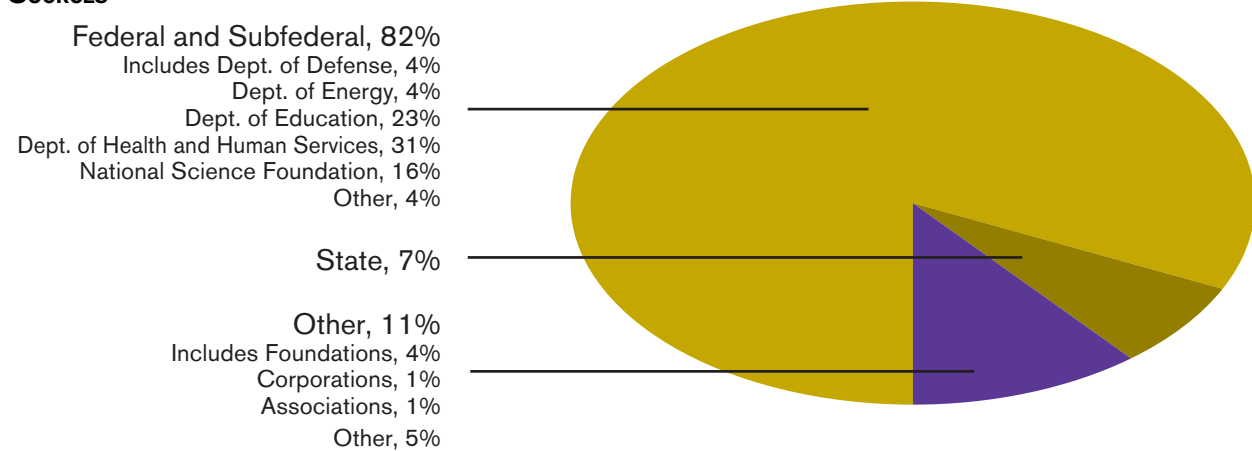
	<i>Fiscal Year 1999</i>	<i>Fiscal Year 2000</i>	<i>Fiscal Year 2001</i>
Federal	\$42,862,943	\$41,866,861	\$43,737,877
Subfederal	9,006,769	8,501,299	3,836,513
Associations	117,261	2,758,657	407,748
States	3,262,840	2,643,389	4,064,781
Foundations	2,217,170	1,948,980	2,147,478
Corporations	628,859	530,090	489,109
Other	520,756	3,896,954	3,094,513
<b>Total</b>	<b>\$58,616,598</b>	<b>\$62,146,230</b>	<b>\$57,778,019</b>

*Source: UO Office of Research Services and Administration*

As demonstrated in Figure 2, federal and subfederal funding of UO research comes from a diverse set of federal agencies. Specifically, the Department of Health and Human Services (DHHS) accounts for the largest percentage of the funding at 37.8 percent, while the Department of Education and the National Science Foundation account for the next largest percentages at 28.2 and 19.9 percent, respectively. Thus, research at the UO is conducted in a range of areas that yield a broad impact on the state.

**FIGURE 2: AWARDS RECEIVED 2000–2001**

**SOURCES**



While total funding has declined somewhat over the last two years, federal funding has continued to grow over time. For example, between 2000 and 2001, direct federal dollars increased by \$1.9 million over the prior fiscal year. Moreover, because many grants are funded over several years, research expenditures have grown dramatically over the last five years with a record \$66 million in total outlay in 2000–2001. Projected research revenue for 2002 is expected to be nearly the same as state support for the first time in university history. Thus, externally funded research support is an increasingly important source of revenue for the UO.

## Financial Aid

Between 1997 and 2000, the UO provided some form of financial aid to 63 percent of its students and provided aid to 96 percent of those students who were eligible under federal and college board guidelines. Table 2 shows that, in the 2001–2 academic year, the UO distributed over \$102 million worth of financial aid. A significant portion of the support of UO students is provided in the form of subsidized federal aid. In particular, \$10.5 million of the total 2001–2 financial aid support was provided in the form of federal grants and nearly \$37 million in the form of subsidized loans. Grants are the most generous form of federal aid in that they do not have to be repaid, while subsidized loans charge the students below-market interest rates and often do not require repayment until six months after the student has graduated. Thus, nearly half of the financial aid provided to UO students is provided in the form of subsidized aid from the federal government.

**TABLE 2: FINANCIAL AID AT UO FOR 2001–2 ACADEMIC YEAR**

<b>FEDERAL AID PROGRAMS</b>	
Federal Grants	\$10,621,569
College Work-Study	1,929,556
Subsidized Loans	36,983,309
Unsubsidized Direct Stafford Loans	23,337,681
Parent Loans	14,062,677
Total Federal Programs	86,934,792
<b>STATE AID PROGRAMS</b>	
State Programs	\$4,264,384
State Need Grants	2,139,117
State Waiver Programs	1,574,281
Institutional Work Study	209,594
Total Oregon State Programs	8,187,376
<b>MERIT-BASED SCHOLARSHIP PROGRAMS</b>	
UO Merit Scholarships	\$5,158,930
General University Scholarships	300,000
Diversity-Building Scholarships	984,403
Other Scholarships	1,539,648
Foundation and Non-UO scholarships	2,972,570
Total Scholarship Programs	10,955,551
<b>Total All Programs</b>	<b>\$106,077,719</b>

*Source: UO Office of Financial Aid*

In addition to ensuring that needy students have access to college, UO scholarship programs have made significant strides toward rewarding the most academically able students. In particular, UO scholarship

programs have grown from less than a \$1 million in 1997–98 to nearly \$10 million in 2001–2. Moreover, over that same time period, UO donors have increased annual distribution of privately funded scholarships by nearly \$3 million. Research conducted using UO data shows that these scholarships encourage the best Oregon students to remain in the state for college and also encourage better out-of-state students to enroll (Singell and Stone, 2001). Thus, it is not surprising that the average high school GPA in the state has increased by 5 percent over the last five years.

In summary, financial aid at the UO assists both needy Oregonians in obtaining a college degree and provides the most able Oregonians an affordable alternative to out-of-state schools. In fact, economic research suggests that, following college, in-state students are more likely to remain in their home state if they attend an in-state college and out-of-state students are more likely to move to the state that they attended college. Thus, financial aid at the UO is an important resource in ensuring that Oregon has the well-educated work force needed in a technology-based economy.

### Nonresident Students

Nonresident students are an important source of out-of-state revenue. Table 3 shows the composition of the student population by resident status for undergraduate and graduate students for fall 2001. The enrollment data indicate that the UO enrolled 19,091 students in fall 2001, which is second only to the projected enrollment for fall 2002 that is expected to be over 20,000 students. The UO is at historically high enrollment levels and is continuing to grow.

**TABLE 3: GEOGRAPHIC DISTRIBUTION OF UO STUDENTS (FALL 2001)**

	<i>Undergraduate</i>	<i>Graduate</i>	<i>Total</i>
Resident	10,984	1,819	12,803
Nonresident			
<i>Out-of-State</i>	3,169	1,474	4,643
<i>International</i>	1,043	602	1,645
Total Nonresident	4,212	2,076	6,288
<b>Total</b>	<b>15,196</b>	<b>3,895</b>	<b>19,091</b>

*Source: UO Office of Admissions*

Table 3 shows that there were a total of 15,196 undergraduates enrolled in 2001 and that 72 percent of enrollees were from the state of Oregon. However, while in-state students continue to constitute the majority of the undergraduate student body, they account for only 42 percent of the undergraduate tuition revenue. Nonresident students contribute a greater share of the tuition revenue because their tuition and fees of \$13,839 are nearly three and a half times larger than that charged to in-state students.

Nonresident students comprise an even higher fraction of the graduate student population, which is typical at research universities. Specifically, Table 3 shows that there were a total of 3,895 graduate students at the UO in fall 2001 and that approximately 47 percent were residents of Oregon. Moreover, nonresident students account for an even higher fraction of the tuition and fee revenue for graduate students because they pay almost two times more than resident graduate students. Specifically, in fall 2001, graduate students accounted for 66 percent of the tuition and fee revenue.

In summary, nonresident undergraduate and graduate students jointly accounted for nearly 60 percent of total tuition and fee revenues in fall 2001. Thus, given that tuition and fees comprise the largest share of

total university revenues, the UO is successfully drawing a significant portion of its support from outside the state. Moreover, although in-state students have increased by 6 percent since 1998, the number of non-resident students has increase by 15 percent over that same time period. Thus, the UO has become increasingly successful at generating out-of-state revenue.

### III. University of Oregon Expenditures

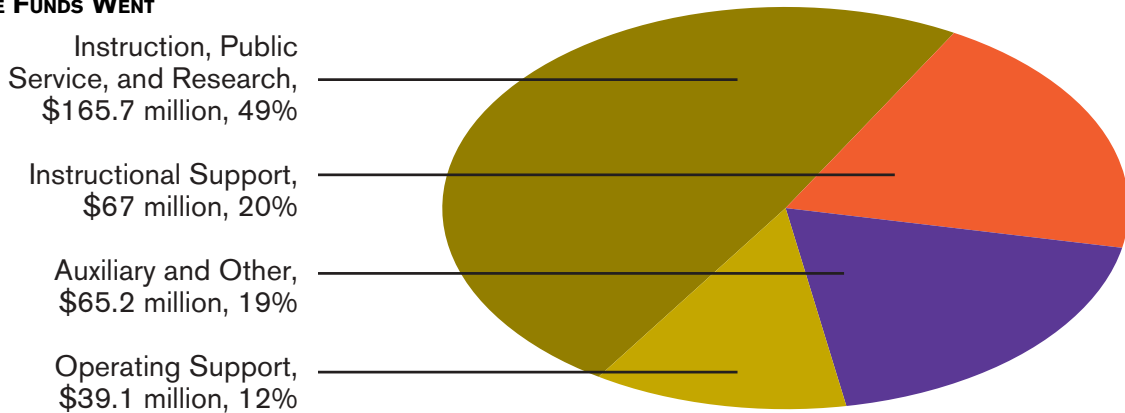
In 2000–2001, the UO spent over \$336 million and employed nearly 7,700 persons. The UO is a major contributor to the Oregon economy because it is a major employer and purchaser of goods and services within the state. However, while the revenue analysis emphasized the importance of out-of-state revenue sources, the ultimate impact of the UO on the Oregon economy depends on whether its purchases of goods and services remain within the state and whether the wages and salaries paid to its employees are spent on goods and services within the state. Thus, the analysis below details how and where the UO spends its funds.

#### Expenditures

Figure 3 shows where the revenue funds were spent. Almost half of UO expenditures were on instruction, public services, and research, whereas 20 percent of expenditures were for instructional support. The largest portion of these costs are for wages and salaries of UO employees, who are likely to spend most of their earnings in Oregon. Thus, while the UO receives much of its revenue from sources located outside the state, most of its expenditures occur inside the state. The remaining portion of this section details UO expenditures in order to evaluate their impact on the state.

**FIGURE 3: 2000–2001 TOTAL CURRENT FUNDS**

**WHERE THE FUNDS WENT**



#### Employment and Payroll

The UO is one of the oldest and most stable employers in the state. In 2000–2001, the UO employed 7,692 faculty, staff, graduate students, and undergraduates. However, excluding part-time undergraduate employment, the UO accounts for 3,745 full-time equivalent jobs. Based on this restrictive definition, the UO is currently the second largest employer in Lane County after Sacred Heart Medical Center and the

eighteenth largest employer in Oregon with roughly the same number of employees as Rouge Valley Medical Center, Asante Health System, Freightliner Corporation, or United States Bakery Corporation.

Table 4 below provides the total number of employees and total number of full-time employees working at the UO in 2001 by category of employment. The UO provides a significant number of high-paying jobs. For example, the data in Table 4 show that 39 percent of UO employees are faculty or administrators, who earn wages that are significantly above the median wage in the state. At the same time, the UO also offers a range of jobs for workers with a variety of different skills. For example, over a third of UO employees are classified staff members that work in clerical, technical, skilled craft, service, or maintenance positions. Finally, the UO is also one of the most stable employers in Oregon, because the demand for higher education is relatively insensitive to economic shocks. In addition, because much of the UO's funding sources reside outside the state, UO employment is also somewhat buffered from regional economic conditions.

**TABLE 4: UO EMPLOYMENT BY EMPLOYMENT CATEGORY IN 2001**

<i>EEO Category</i>	<i>Full-time</i>	<i>Total</i>	
	<i>Headcount</i>	<i>Headcount</i>	<i>FTE</i>
University Administrators	37	41	39
Faculty	1,045	1,567	1,280
Other Professional	664	824	747
Clerical/Secretarial	532	668	615
Technical/Paraprofessional	116	208	167
Skilled Craft	110	112	112
Service and Maintenance	291	327	309
Graduate Students	—	1,266	485
Student Employees	—	2,679	n/a
<b>Total Employees</b>	<b>2,795</b>	<b>7,692</b>	<b>3,754</b>

*Source: UO Office of Resource Management*

Table 5 summarizes the compensation paid to UO employees for the fiscal year 2001–2 by category of employment. In particular, Table 5 shows that the UO pays nearly a quarter of a billion dollars to its employees in wages, salaries, and benefits. To put this in perspective, employee compensation accounts for over 80 percent of UO expenditures. Because most employees spend their income locally, the vast majority of university outlays remain in-state. Moreover, less than half the total employee compensation is paid to faculty and over half is paid to classified staff, which reinforces that fact that the university employs workers with a diverse set of skills.

**TABLE 5: WAGES AND BENEFITS PAID TO UO EMPLOYEES BY EMPLOYEE TYPE IN 2001–2 FISCAL YEAR**

<i>Category</i>	
Faculty	\$93,800,000
Administration	60,000,000
Classified Staff	47,500,000
Students (Graduate and Undergraduate)	22,200,000
Temporaries	2,350,000
<b>Total</b>	<b>\$225,850,000</b>

*Source: UO Office of Resource Management*

The number of employees on the university payroll may understate the impact of UO employees on the state, because it does not include UO retirees. Specifically, over the last decade, between sixty and 130 workers have retired annually from the UO. These workers collect retirement benefits, which they spend on goods and services. Retirees generally have a higher propensity to consume because they have fewer deductions out of their income (e.g., no retirement deduction). Thus, although not all UO retirees remain in-state postretirement, there are likely to be several hundred UO retirees in the state at a given point in time, with expenditure levels similar to those who are currently employed. It follows that the compensation paid to current UO employees is likely to be a conservative estimate of the level of expenditures in the state by the full set of UO employees, working and retired.

## Purchasing

### Goods and Services

In 2001–2, the UO purchased more than \$170 million worth of goods and services. These purchases covered a wide range from both inside and outside the state. For example, in the last year, the UO has had contracts in excess of \$1 million dollars with Oregon firms such as Wildish Construction and EWEB and out-of-state firms such as Siemens Medical Systems and Dell Computer. Alternatively, the UO also had contracts for less than \$25,000 with in-state firms such as the Trane Oregon Services Company and North Pacific Seafood Company and out-of-state firms such as Continental Athletic Supply and Research Libraries Group. Thus, the UO conducts business with a diverse set of firms.

UO purchases within the state will have a direct impact on Oregon business and will also generate income and additional purchases that indirectly benefit Oregonians. The table below includes information for invoicing activity for the fiscal year 2002. To focus on the impact of UO expenditures on the state of Oregon, the total dollar expenditures and number of vendors are distinguished by whether the payment address is within or outside the state of Oregon. This will tend to understate the effect of UO expenditures on the state because, while many corporations have headquarters outside the state, a significant number of their employees may reside in Oregon. For example, the UO conducts over a million dollars of business with the U.S. Postal Service, which employs a significant number of workers in the state even though its headquarters is located in Washington, D.C. Nonetheless, even with this conservative definition, Table 6 below indicates that more than 64 percent of purchases and approximately 41 percent of the vendors are located in Oregon. Thus, the UO conducts a significant share of its business with vendors located in Oregon.

**TABLE 6: NUMBER AND EXPENDITURE OF UNIVERSITY OF OREGON VENDORS IN FISCAL YEAR 2002**

	<i>Number of Vendors</i>	<i>Total Expenditures</i>
Oregon	4,460	\$108,904,000
Outside Oregon	6,510	61,712,000
<b>Total</b>	<b>10,970</b>	<b>\$170,616,000</b>

*Source: UO Office of Business Affairs*

The UO has made a concerted effort over the years to ensure that small businesses in the state are given the opportunity to compete for contracts with the university. Table 7 below summarizes the total expenditures and the number of vendors by dollar volume of business with the UO. The data show that over 95 percent of the vendors have a total volume of business less than \$25,000 with the UO. Moreover, while the majority of the total sales volume is conducted with large firms, it is still the case that 35 percent of the contracts have a total dollar volume below \$300,000. While the annual purchases of the UO exceed the annual revenue of all but the top thirty private companies in the state, it continues to conduct a large share of its business with small Oregon firms.



**TABLE 7: UO VENDORS BY DOLLAR VOLUME OF BUSINESS IN FISCAL YEAR 2002**

	<i>Number</i>	<i>Oregon</i>	<i>Outside Oregon</i>	<i>Total</i>
More than \$300,000	76	\$81,177,000	\$30,630,000	\$111,807,000
\$100,000 to \$300,000	140	11,528,000	12,180,000	23,708,000
\$25,000 to \$100,000	319	6,982,000	7,916,000	14,899,000
Under \$25,000	10,357	9,217,000	10,986,000	20,202,000
<b>Total</b>	<b>\$10,892</b>	<b>\$108,904,000</b>	<b>\$61,712,000</b>	<b>\$170,616,000</b>

Source: UO Office of Business Affairs

## Construction

Over the last five years, the UO has averaged over \$15 million in total capital construction projects annually. For example, construction projects completed in the last five years include the Moshofsky Sports Center, the renovation of the Erb Memorial Student Union and McKenzie Hall, the new Recreation and Fitness Center, and the William W. Knight Law Center. A unique aspect of several of these construction projects is that they were either partially or fully funded through private donations. For example, the Moshofsky Sports Center was fully funded with \$16.6 million in private donations, while \$14.7 million in private donations covered half the construction costs of the Knight Law Center with the remaining funding from bonds. Other projects were partially funded through user fees (e.g., \$8.7 million in student building fees and \$8.8 million in student recreation fees for the Student Recreation Center). Thus, the UO has made significant efforts at funding its construction projects internally.

To provide an example of the types of construction projects undertaken by the UO, Table 8 summarizes the major capital construction projects that were completed in 2001. Major capital construction projects include any projects that exceed \$500,000 in total outlay. The figures indicate that the UO spent over \$10.5 million on major capital construction projects in 2001. In addition to major construction projects, the UO also undertook twenty-seven space rehabilitation projects, which account for an additional \$4.1 million in construction expenditures. These construction projects rely largely on firms located within the state. The construction on the UO campus is an important source of business for construction firms in Oregon.

**TABLE 8: CAPITAL CONSTRUCTION AND SPACE REHABILITATION BY UNIVERSITY OF OREGON IN 2001**

<i>Capital Projects (over \$500,000 Project Cost)</i>	<i>Total Cost</i>
Allen Hall Renovation Phase 5	\$900,000
Casanova Center Weight Room Expansion	1,500,000
Cascade Annex Stores Relocation	730,000
Housing, Graduate Student	4,500,000
Klamath Hall Phase 2 Green Lab project	816,017
Klamath 245-255 William 309	635,000
McArthur Court Exterior Repairs 2000 Project	715,326
Villard Third Floor Remodel	774,433
<b>Total Capital Projects</b>	<b>\$10,570,776</b>
<b>Total Space Rehab (27 projects)</b>	<b>\$4,165,997</b>
<b>Total Capital Projects and Space Rehab</b>	<b>\$14,736,773</b>

Source: UO Office of University Planning



Over the next five years, UO construction projects, in various stages of planning or completion, will yield historically large construction outlays. Projects include the Autzen Stadium expansion that allocates \$72 million in direct construction costs, the Lillis Business Complex that accounts for \$40 million in construction costs, and \$12 million for the Museum of Art's addition and alterations. Much of the funding for these projects is generated through private donations and user fees that the state is not required to fund.

## UO-Related Expenditures by Students

These expenditures by the UO are likely to understate the direct infusion of funds into the state, because students generally have a significant level of expenditures beyond tuition, housing, and fees that do not go through the university. In particular, student expenditures on goods and services such as off-campus housing and groceries are often a significant portion of their college outlays and would not be reflected in the direct UO expenditures. The Office of Student Financial Aid and Scholarships estimates that undergraduates spend an average of \$2,352 annually on miscellaneous personal expenditures in addition to the major on-campus expenditures of tuition, fees, and books, while those students who live off campus spend an average of \$6,210 a year on meals and housing. Thus, the 19,901 enrollees at the UO in 2001 spent approximately \$46 million in off-campus personal expenditures, while the 15,967 students who lived off campus spent an additional \$99 million. It follows that UO students potentially make \$145 million in off-campus expenditures. Some of these off-campus expenditures may be accounted for in direct UO expenditures because they take place at UO-affiliated enterprises (e.g., UO football games). Even if only a tenth of these off-campus expenditures were assumed to take place at non-UO-affiliated establishments (which is extremely conservative), UO students would account for \$14.5 million in additional expenditures beyond the \$336 million in direct expenditures by the UO.

## IV. Multiplier Effects

### The Multiplier Concept

The impact of expenditures by the UO on the state may be significantly greater than the estimated \$351 million university-related outlays on wages, salaries, goods, services, and construction. The reason why UO direct expenditures have a larger total impact on the state is due to what economists refer to as multiplier effects. As an example, consider the Autzen Stadium expansion. Construction firms in the area that win the contract from the UO will experience an increase in the demand for their services. In order to meet this final demand, these construction companies will, in general, have to purchase additional equipment, supplies, and services, as well as hire additional labor. If the firm purchases any of the nonlabor inputs from other producers in the state, then these producers also have to increase their production, necessitating an increase in both the labor and nonlabor inputs. Moreover, a significant fraction of the employees for these construction firms will spend their wages and salaries at local stores, which expands the demand for retail goods and consumer services in Oregon and potentially leads to new business start-ups. In other words, direct expenditures by the UO can work themselves through the state economy several times and these series of indirect expenditures can yield a total economic impact that is several times larger than the original expenditure. It also follows that the increase in expenditure generates both a direct and indirect increase in the demand for labor and yields a multiplier effect for the number of jobs generated in the state.

There is also some reason for caution when calculating multiplier effects. For example, if the hypothetical construction firms above purchase their supplies from firms located in the state of Washington, then the

UO expenditures may “leak” out of the state and not generate additional expenditures in Oregon. It follows that the size of the multiplier effect on expenditures and jobs can vary depending on factors such as the size of region under consideration, the amount of time the study considers (e.g., one month versus one year), or the types of expenditures that are undertaken (e.g., construction versus research).

Fortunately, there are a large number of studies that have estimated the multiplier effect for universities on local economies. For example, Leslie and Brinkman (1988) survey thirty-nine studies, yielding a range of expenditure multipliers between 1.5 and 2.5 and job multipliers between 1.3 and 3.0. These estimates are consistent with those obtained using the Impact Analysis for Planning (IMPLAN) input-output model developed by the U.S. Department of Agriculture, which was estimated using 528 separate industries in 1997. Thus, these multiplier effect ranges likely include the “true multiplier effect” for the UO.

## The Expenditure and Job Multipliers

For simplicity, this analysis will use the midpoint of the above ranges to approximate the expenditure and job multiplier effects. In other words, each \$1 expenditure by the UO is assumed to generate \$2 of total expenditures in the state (i.e., a \$1 spent by the UO plus an additional \$1 of indirect expenditures). Likewise, each additional job at the UO is assumed to generate 2.15 total jobs in the state. These midpoint estimates are likely to be conservative because most multiplier studies have focused on the impact of a university on a local community (e.g., Eugene) and not a state economy. Studies that focus on local communities versus a state tend to have greater “leakages” from the system that reduce the estimated multiplier effect. For example, the Autzen Stadium expansion does not rely exclusively on local Eugene contractors, but most of the contractors are from Oregon. It follows that using the midpoint of local expenditure and job multipliers is likely to be conservative because these multiplier effects would be expected to be relatively larger for a state than for a local community.

To estimate the direct impact of the university on the state, we focus on the UO’s expenditure budget, which can be viewed as the final demand for the university’s product. In other words, the university uses various inputs to produce its educational services and research that are reflected in its expenditures. Thus, if the demand for university services increases because of an increase in enrollment, then the university purchases additional labor and nonlabor inputs like any other producer. The change in final demand is represented by the increased tuition, fees, and other revenues (e.g., ticket sales at football games) that cover the cost of expansion. Similarly, if a university receives additional grants, generates revenue through a research park, or receives a donation to fund a capital construction project, these funds will have a direct impact on the state if they are used to purchase labor and nonlabor inputs. Thus, the expenditure budget measures the direct impact of the UO on the state. The subsequent analysis examines the indirect effect of these expenditures as reflected in the multiplier effect on expenditures and jobs.

## Direct and Indirect Expenditures

The expenditure multiplier can be used to estimate how the direct expenditures by the UO generate indirect or induced expenditures in the state. Column 2 in Table 9 below lists each of the direct total restricted and unrestricted expenditures by the UO for each of the expenditure categories in 2000–2001 and the estimated UO-related expenditures by students in off-campus establishments in 2000–2001. The figures in Table 9 indicate that the total direct expenditures come to \$351.5 million, which is less than total revenue for the same time period because of net transfers and other additions.

**TABLE 9: DIRECT AND INDIRECT EXPENDITURES BY UO IN 2000–2001**

<i>Category</i>	<i>Direct Expenditure</i>	<i>Indirect Expenditure</i>	<i>Total Expenditure</i>
Instruction	\$106,327,729	\$ 106,327,729	\$212,655,458
Public Service	18,527,663	18,527,663	37,055,326
Research	40,874,942	40,874,942	81,749,884
Academic Support	28,615,106	28,615,106	57,230,212
Student Services	14,297,150	14,297,150	28,594,300
Operation and Maintenance of Physical Plant	14,759,070	14,759,070	29,518,140
Capital Improvements	1,230,386	1,230,386	2,460,772
Institutional Support	21,626,995	21,626,995	43,253,990
Student Aid	24,067,627	24,067,627	48,135,254
Service Departments	1,456,506	1,456,506	2,913,012
Auxiliary Program Expenditures	65,212,689	65,212,689	130,425,378
Other Expenditures	3,552	3,552	7,104
<b>Total UO Expenditures</b>	<b>336,999,415</b>	<b>336,999,415</b>	<b>673,998,830</b>
Estimated Off-Campus Expenditure	14,500,000	14,500,000	29,000,000
<b>Total UO-Related Expenditures</b>	<b>\$ 351,490,415</b>	<b>\$ 351,490,415</b>	<b>\$ 702,980,830</b>

*Source: Direct Expenditure Data from UO Office of Research Management. Expenditure Multiplier is 2.0*

In this case, because the multiplier is assumed to be 2, each UO dollar of expenditures is predicted to generate an additional dollar of expenditures in the state. Thus, the estimated indirect effect of UO expenditures is the same as the direct expenditures. The indirect expenditures are listed in column 3 of Table 9, which indicate that the UO generates an additional \$351 million in indirect expenditures. Thus, summing the direct and indirect expenditure effects, the total estimated impact of the UO on the state economy is nearly three quarters of a billion dollars annually. If one makes the conservative assumption that half of this generated revenue is paid out in the form of taxable wages and salaries and that the marginal tax rate is 9 percent, the direct and indirect expenditures by the UO yield approximately \$16 million in additional income tax revenue annually. Thus, the UO is an important economic source of income tax revenue in the state.

## Direct and Indirect Job Creation

The job multiplier can be used to estimate how workers who are directly employed by the UO generate demand for goods and services that indirectly create jobs in the state as a whole. The UO employed 3,747 workers in 2000–2001. However, some of these employees do not work on a full-time basis. Thus, a job is not defined as the number of persons employed at the UO, but the number of full-time equivalent jobs at the UO. There are 3,269 direct full-time equivalent jobs listed for the UO in Table 10.

**TABLE 10: DIRECT AND INDIRECT EMPLOYMENT GENERATED BY UO**

<i>EEO Category</i>	<i>Direct FTE</i>	<i>Indirect Employment</i>	<i>Total Employment</i>
University Administrators	39	45	84
Faculty	1,280	1,472	2,752
Other Professional	747	859	1,606
Clerical/Secretarial	615	707	1,322
Technical/Paraprofessional	167	192	359
Skilled Craft	112	129	241
Service and Maintenance	309	355	664
Total Nonstudent Employees	3,269	3,759	7,028
Graduate Students	485	558	1,043
<b>Total Employees</b>	<b>3,754</b>	<b>4,317</b>	<b>8,071</b>

*Source: Direct FTE data from Office of Resource Management. Job Multiplier is 2.15*

In addition to regular UO employees, there are also 1,266 graduate students who work as teaching and research assistants on campus. These graduate students account for an additional 485 full-time equivalent jobs listed in Table 10. Undergraduate students also often work in order to help pay for school, and these students provide an important labor source in the state. However, for simplicity, the analysis excludes the 2,679 undergraduate students who are employed on campus and an unknown number of students who are employed in establishments off campus, because information regarding their full-time equivalent status is not available. Nonetheless, by ignoring the direct and indirect job creation resulting from undergraduate employment, the analysis likely provides a conservative estimate for the number of jobs generated by the UO.

Table 10 indicates that the UO directly generates a total of 3,754 full-time equivalent jobs, which places the UO among the top twenty employers in the state. Table 3 shows that, based on the average job creation multiplier of 2.15, the UO is predicted to generate an additional 4,317 jobs. It follows that UO spending has helped create a total of 8,017 jobs in the state. To put this in perspective, this result suggests that the UO accounts for roughly 7 percent of the work force in the cities of Eugene and Springfield and nearly 0.7 percent of Oregon's total work force. Thus, the UO is an important factor in the labor market for the state.

## V. Implicit Benefits of the University of Oregon

The prior analysis has detailed the explicit benefits of the UO using well-established techniques that have been applied to other colleges and universities. Although the explicit benefits of a university are clearly important and relatively easy to measure, universities also have a number of implicit benefits that are unique to higher education and may actually have a larger impact on a state's economy than their explicit benefits.

For example, a university's primary function is produce human capital. This raises the productivity of the work force and the subsequent tax base in the state. Moreover, universities also bring together a large number of scholars in a single location, creating a synergistic research environment that attracts and pro-

motes business. The analysis below quantifies some of these implicit benefits, such as the value added of a university degree, and provides some examples of hard-to-quantify, but important, other implicit benefits.

## Value Added of a UO Degree

A university degree is an investment in human capital that pays a return similar to that of physical capital, which is reflected in the fact that college graduates generally earn more than high school graduates. This earnings increase is important to a state because the higher earnings yield a larger statewide tax base. The increase in the Oregon tax base from a UO education can be estimated by combining data from the UO on the number of undergraduate and graduate degrees holders who remain in the state with data for the average wage differential between college and high school graduates over time, along with marginal tax rates.

To calculate the value added to the state economy of a typical graduating class at the UO, it is necessary to get a measure of the number of undergraduate and graduate degrees produced by the UO. Table 11 shows the number of bachelor's, graduate, and professional degrees produced by the UO in each of the last five years. The data show that there is some variation in the number of degrees produced by the UO over time. Nonetheless, the average of 2,991 undergraduate and 1,072 graduate and professional degrees over the last five years provide a reasonable approximation of a typical cohort, which is used in the value added calculations.

**TABLE 11: DEGREES AWARDED BY UO 1995–96 THROUGH 2000–2001**

	1995–96	1996–97	1997–98	1999–2000	2000–2001	5-year total
Bachelor's	2,857	3,011	3,128	3,066	2,894	14,956
Master's	744	710	731	831	786	3,802
Doctoral	146	166	160	138	156	766
Professional	131	157	175	184	149	796
<b>Total</b>	<b>3,878</b>	<b>4,044</b>	<b>4,194</b>	<b>4,219</b>	<b>3,985</b>	<b>20,320</b>

Source: Institutional Research Services, Oregon University System

The average number of degree recipients overrepresents the potential contribution of UO graduates to the state economy, however, because not all graduates remain in the state. Table 12 shows the fraction of UO bachelor's and graduate degree recipients who remain in the state over several five-year intervals. These retention rates vary between 67 percent for the most recent cohort of students obtaining bachelor's degrees to 37 percent for students who obtained a graduate degree between 1987–91. These retention rates are used to calculate the number of UO graduates that remain in the state, where the 1997–2001 rate is used for the first ten years, the 1987–91 rate is used for the second ten years, and the 1977–81 rate is used for all remaining years.

**TABLE 12: STATE RETENTION RATES FOR UO UNDERGRADUATE AND GRADUATE DEGREE HOLDERS**

Cohort	Undergraduate	Graduate
1997–2001	0.6646	0.5408
1987–91	0.5201	0.3662
1977–81	0.4712	0.5246

Source: UO Foundation

The value added to the state tax base depends on the wage differential between college and high school graduates. The wage data are drawn from the Bureau of Labor Statistics in 2000, which reports the median earnings of \$54,972 and \$31,501 for college and high school graduates respectively. In addition, persons with advanced degrees earn an average of 15 percent more than college graduates. While these earnings estimates provide a measure of the tax base at a particular point in time, workers pay taxes throughout a career, which requires a measure of the growth rate of earnings. The Department of Labor indicates that the real rate of growth of earnings has been approximately 2 percent for college graduates and 1 percent for high school graduates over the last three decades. Thus, the growth rate of earnings also tends to be larger for college versus high school graduates. However, because wages tend to grow over time, the earnings of new entrants into the labor market tend to be less than the median because young workers have yet to acquire on-the-job experience. The Bureau of Labor Statistics reported that workers with one year or less of experience earn approximately 50 percent of the earnings of the median worker in 2000. The value added is calculated using the entry level wage and the growth rate in earnings to calculate the stream of earnings over a career up to the age of sixty-five.

Two additional assumptions are required to calculate the value added. First, a dollar today is worth less than a dollar tomorrow, because a dollar today can be invested and earn interest. Thus, all dollars are measured in current dollars, or their present value, to make sure that all dollar values are in the same units. The present values are calculated assuming a real rate of interest is 3 percent. Second, the value estimate requires an assumed tax rate. The Oregon tax system is designed such that a college graduate at the median income level will pay taxes at the maximum rate of 9 percent. Thus, the marginal tax rate is assumed to be 9 percent.

Table 13 provides the estimates of the increase in the tax base and tax revenue by an average class of UO degree holders. The increase in the tax base for undergraduate (graduate) degrees is derived by calculating the present value of the difference in the stream of earnings between college (graduate) and a high school degree holders over a career weighted by the number of students who remain in the state after graduation. Jointly, these estimates indicate that the average UO graduating class yields over a \$1.3 billion increase in the tax base over their collective careers. It follows that at a 9 percent marginal tax rate, the state tax base increases by over \$121 million over the career of a typical UO graduating class. To put it in context, state appropriations for the year-end 2001 were \$76 million. Thus, the state earns about \$1.60 for every \$1.00 it pays to support UO students just from the value added of a UO degree. This estimated 60 percent return on investment is four and a half times higher than the 13 percent average rate of return on equities in the stock market over the last fifty years.

**TABLE 13: TAX BASE AND INCOME TAX REVENUE GENERATED BY VALUE ADDED OF UO DEGREES FOR AVERAGE GRADUATING CLASS**

	<i>Present Value Increase in Tax Base</i>	<i>State Income Tax</i>	<i>Present Value Increase in Income Tax</i>
Undergraduate	\$842,569,489	9%	\$75,831,254
Graduate	509,291,673	9%	45,836,251
<b>Total</b>	<b>\$1,351,861,162</b>	<b>9%</b>	<b>\$121,667,504</b>

*Source: Wage data from Bureau of Labor Statistics and US Census*

Several factors may actually lead these estimates to be conservative. First, the 2000 Oregon Fact Book indicates that approximately 62 percent of UO freshmen graduate within six years. However, economic research shows that even a single year of college increases wages over a high school degree. Thus, by



focusing on graduates, the analysis ignores nongraduating attendees who are also likely to experience an increase in wages. Second, focusing on average wage increases tends to understate the increase in tax revenue from the value added of a college degree because income tax rates are progressive. It follows that the above-average wage increase for a graduate in a relatively high paying area (e.g., computer programming) will increase tax revenue by more than the decrease in revenue from a degree that earns less than the average wage. Third, the average retirement age for college graduates is later than that of the average person in the U.S. Specifically, because the types of jobs a person can obtain with a college degree typically require less physical labor, a college graduate typically is able to work longer than if this same individual held a high school diploma.

One factor could also lead these estimates to overstate the return. Specifically, college and graduate degree holders are more likely to operate in a national job market, which may make them more likely to leave the state after graduation. Thus, a UO degree may lead to a lower retention rate for Oregon residents educated in the state. However, recent research in economics also shows that attending a college in a given state increases the likelihood that students will remain in the state for employment. Thus, the overall effect of a college degree on retention is not known.

On balance, it is difficult to assess how various factors will affect the estimated contribution of UO graduates. Nonetheless, all of these unaccounted factors are likely to be of secondary importance in comparison to the direct effect of a degree on earnings. Moreover, this analysis ignores other tax sources such as property taxes that are also likely to increase with a UO degree, because persons with higher incomes tend to own more expensive properties. Thus, while it is not possible to give an exact estimate of the increase in the tax revenue generated by degree recipients, its true value is likely to be even larger than the provided estimate of \$121 million.

## **Stimulus for Business and Research**

### **Job Creation and Attraction**

The value added of a university degree is greater than simply the increase in the average wage of university students. In particular, universities help to foster ideas that not only make the attending student more productive, but may also increase the productivity of persons around them. For example, listed below are ten prominent UO graduates whose businesses in Oregon would likely not be at their present levels of success without a college degree:

Philip H. Knight—NIKE

Carolyn Chambers—Chambers Communications

Tim Boyle—Columbia Sportswear

Randy Papé—The Papé Group

Scott Thomason—Thomason Auto Group

Richard and David Boyd—Boyd Coffee Co.

Jim Bernau—Willamette Valley Vineyards

Jerry Beall—Beall Corporation

Robert Harrison—Willamette Valley Co.

Ron Fraedrick—Taco Time International

Dan Wieden—Wieden and Kennedy

Aaron Jones—Seneca Sawmill Co.

These businesses employ thousands of people in the state and generate billions of dollars in revenue. Thus, the role of the university in retaining bright, energetic entrepreneurs and its role in creating knowledge and ideas can yield benefits that extend well beyond those that accrue to individual students.

Higher education also plays a key role in attracting high paying jobs to the state. In the twenty-first century, access to a well-educated pool of workers is as important as access to raw materials was in the previous century. For example, economic research indicates that the pay differential between the top earning quartile and the bottom earning quartile of the population has expanded over the last several decades due in large part to an increasing return to education. Moreover, many employers rank availability of high-skilled labor as the most important factor in their location decision for a new facility. The quality of the work force is particularly important for small states like Oregon that do not offer product-market advantages (such as access to large markets) as those competing states to the north and south.

### **Technology Transfer and University-Industry Partnerships**

UO faculty, staff, and alumni have created a plethora of successful companies that energized not only the state of Oregon but the U.S. and world economies. Foremost among these UO spinoffs is sportswear firm Nike Inc., founded in the 1960s as Blue Ribbon Sports by UO's track coach Bill Bowerman in partnership with former UO athlete and accounting major Phil Knight. Incorporated in Oregon in 1968, Nike has grown to become the largest seller of athletic footwear and athletic apparel in the world, reporting revenue of \$9.89 billion in fiscal year 2002. Other UO spinoff companies are making significant and worldwide contributions, including:

1. The Oregon Research Institute and the Oregon Social Learning Center, two behavioral research organizations in Eugene that now employ hundreds of Oregonians and annually bring millions of federal research dollars into Eugene-Springfield
2. SeQuential Biofuels LLC, a renewable energy marketing company in Eugene that was recently founded by two former UO graduate students
3. Electrical Geodesics Inc., another local company created by UO professor Don Tucker that has become a world leader in dense-array EEG devices and has won several awards for outstanding commercial development of biomedical innovations
4. On Time Systems Inc., a Eugene-based spinoff from UO's Computational Intelligence Research Laboratory, that creates innovative software applying artificial intelligence algorithms to efficiently execute exceedingly complex tasks, such as building an aircraft carrier or navigating the freeways of Los Angeles
5. Language Learning Solutions LLC, a new Eugene company derived from Carl Falsgraf's work at the UO Center for Applied Second Language Studies, that is commercializing innovative tools to support the learning and teaching of foreign languages (including English!)



To aid the movement of University of Oregon innovations into the private sector, the UO created its first professionally staffed Office of Technology Transfer (OTT) in 1992. Over its first ten years, OTT has maintained a strong track record of translating academic research programs into new businesses, and is ranked twenty-fifth among 117 United States universities for start-up creation per research dollar in a recent article in the *Chronicle of Higher Education*.

In addition to spinoff companies, the University of Oregon's faculty and staff have created a number of commercially successful innovations that span a broad range of market sectors, from biomedical research tools to innovative furniture designs. Products now in testing or development by UO's commercial partners include potential cancer therapeutics, pain medications, telecommunication technologies, educational assessment products, and others. A few examples of UO innovators and their innovations include:

1. John Keana, whose work in medicinal chemistry has formed the basis for more than fifty United States patents
2. Craig Hickman, associate professor of art, who developed the popular children's drawing program KidPix
3. Dale Tronrud and Brian Matthews, authors of TNT, a scientific software package in use worldwide by major pharmaceutical companies to analyze protein structure
4. Kent Stevens, inventor of a patented, computer-based process for diagnosis of visual field defects that is currently in clinical testing
5. Rod Capaldi and Mike Marusich, whose investigations in molecular biology have generated a portfolio of monoclonal antibodies that are sold to the international research community by an Oregon biotechnology company

In addition to supporting faculty members in commercializing their inventions through licensing and start-up companies, the UO also has worked to develop the Riverfront Research Park (RRP) as a cooperative effort with private developers on a sixty-seven-acre site adjacent to the university campus. The research park provides a master-planned setting for up to one million square feet of development, where knowledge-based businesses and organizations can start and grow in close proximity to and in collaborative association with a research university.

Research park tenants currently employ approximately 300 people annually, with average salary and benefits in excess of \$50,000 per year, and annual payroll exceeding \$15 million. Additionally, in the past seven years over 350 students have been employed and received valuable job experience in fields related to their studies, while 110 graduates have been hired into full-time positions. In fiscal year 2001–2, university and private developers entered or extended leases totaling \$4.2 million in value over the lease periods.

To date, a total of thirty-three tenant companies and groups have been located in the RRP, including fourteen start-up companies. They represent an array of research and development interests, including behavioral science, artificial intelligence, customer relationship management, Internet-based multimedia and software development, genomics, English and foreign language tool testing and development, biotechnology, and development of neuroimaging instrumentation for equipment and software for medical use. By providing an environment that encourages the transfer of research and technology to the private sector, the UO is an important source of new business innovation that helps the growth and diversification of the region's economy.

The UO also aids business and research in the state by providing a site for conferences during the summer months when university housing space is available. University housing provides an ideal conference site because of the availability of large conference rooms that are in close proximity to large dining and catering facilities and relatively inexpensive accommodations in the dorms. The UO and the Office of University Housing has a close connection to Convention and Visitors Association of Lane County, and though this relationship has organized over seventy conferences in the last year. These conferences not only facilitate business in the state, but also supplement the university housing budget by over \$1 million annually. These additional funds help keep housing affordable for UO students.

The UO is also a repository for state-specific data and provides the professional expertise to evaluate the needs of Oregonians. For example, the Oregon Survey Research Laboratory (OSRL) was established in the fall of 1992 with a small seed grant from the UO. OSRL currently employs fifteen professional research staff members and forty part-time professional interviewers, and is the only fully functioning public survey research laboratory in the state. OSRL's central mission is to serve as a resource and an intellectual home for faculty and staff members as well as students involved in survey-related research. However, OSRL also offers a complete range of research tools to local, state, and federal government, other research organizations, and nonprofit organizations at survey rates below those typically charged by private firms. Since 1995, OSRL has conducted over 200 surveys, of which nearly a quarter have been conducted for state and local governments. Thus, OSRL is an important resource not only for the faculty and students, but also for other state agencies. The availability of a first-class survey facility such as OSRL ensures that high-quality survey research is available in Oregon at competitive prices.

### **Job Matching**

The university also plays an important role as intermediary between students and business. For example, the Career Center at the UO serves to match students with employers. This matchmaking role not only benefits UO students who are seeking a job, but also aids employers who increasingly require well-trained and educated employees. Specifically, in 2001–2, 216 companies conducted interviews or presentations through the UO Career Center and associated career fairs. Over this same time period, the career fair also helped with eighty-eight campus presentations by companies and organizations. Overall, there were 201 campus interview visits requested by companies and organizations, with a total of 1,462 students interviewed on campus.

### **International Students**

Many nonresident students originate from outside the United States. Foreign students, in addition to providing a source of out-of-state revenue, provide UO students with an invaluable educational resource. In particular, a diverse student population promotes learning on a college campus both through the exchange of ideas and the sharing of cultures.

International students are a significant contributor to the diversity of the student body. For example, in fall 2001, there were 1,440 international students from seventy-nine countries registered at the UO, which represented a 5 percent increase from the previous year. It follows that international students comprise 7.5 percent of the 19,091 students at the UO in the fall of 2001. In other words, one in thirteen students at the UO originate from outside the United States.

In addition, the UO shares responsibility for 193 international students who are on practical training and 133 international students who are enrolled in the American English Institute. In total, there were 1,766 international students on campus in fall 2001, which is 9.3 percent of the student body.

Students at the UO are not only exposed to a wide variety of ideas in the classroom, but also to the diversity of their classmates. A work force that understands how different cultures interact is increasingly important in a global economy. This is particularly important for an Oregon economy that is increasingly dependent on foreign trade for economic growth.

## VI. Volunteer, Internship, and Community Service Programs

The University of Oregon is a major contributor to the state through the volunteer, internship, and community service programs. Many of these programs are formal parts of the university curriculum whereby students must serve as off-campus volunteers in order to obtain degrees. In addition, the university promotes volunteer activities and community service among its students and faculty members as part of the fundamental mission of higher education. For example, the UO Undergraduate Student Satisfaction Survey conducted in spring 1999 indicates that a quarter of all UO students had volunteered or interned in the past year. In other words, over 4,000 students participated in volunteer work over the course of an academic year. The services that students provide are wide ranging and have both a significant economic impact on the state and foster an important sense of community. The UO offers a variety of programs ranging from the free assessment and treatment of children with communication disorders to a full slate of public lectures funded by the Oregon Humanities Center. Detailed below are several volunteer and community service programs that highlight the diversity of service opportunities offered in the UO curriculum.

### Student Teachers

Education students at the University of Oregon are required to participate in at least three different types of classrooms in Oregon schools over the course of their teacher training. UO students can receive training in a wide range of areas, such as communication disorders and music education. These student teachers often offer expertise in areas that may not generally be available among a school's faculty and provide an important resource to Oregon schools. For example, in the 2000–2001 academic year, the UO placed 151 student teachers in K–12 classrooms throughout the state, which comprised more than 15 percent of the total number of students placed by all of Oregon public universities. However, estimating the economic contribution of these student teachers is difficult. The average annual salary for teachers is over \$40,000 according to the Oregon Department of Labor. Thus, if these students were paid a quarter of the average teacher salary in the state, which is likely to be a more conservative estimate, their services would be worth over \$1.5 million annually.

Additionally, UO-educated teachers typically remain in Oregon to teach. For example, a U.S. Department of Education survey of Oregon student teachers in 2001 indicates that 80 percent plan to remain in Oregon, and 75 percent plan to teach in public schools. In this way, the human capital acquired on campus and in Oregon schools is retained as a resource for the state. The education and retention of teachers is particularly important over the next decade because the Oregon Department of Education estimates that 13 percent of Oregon teachers are expected to retire between 2001 and 2005.

### The Pro Bono Program

The UO School of Law requires their students to provide pro bono legal services as part of earning a law degree. These students provide a broad range of services, typically to clients who could otherwise not

afford them. Some examples of these services include providing legal research for the federal public defender's office for indigent defendants charged with federal crimes; researching and writing client declaration for political asylum cases for the Lane County Law and Advocacy Center; aiding a domestic violence clinic seeking restraining or stalking orders; supervision of noncustodial visits between parents and children for Lane County Legal Aid; and preparing taxes for elderly clients for the Volunteer Income Tax Assistance Program. In 2001, UO law students provided over 3,190 hours of legal service. Although these services are likely to be compensated at rates below market because they are provided to persons who might not otherwise be able to afford legal services, the value to the state is close to market rate since it would otherwise be obligated to provide these services. At a minimum, these hours would be expected to be billed out at a rate of a law clerk, which the Oregon Employment Department indicates was \$16.36 an hour in 2000. At this rate, UO law students provided over \$52,000 worth of free legal assistance to needy Oregonians in 2001.

## **Oregon M.B.A. Consulting or Opportunity Planning Team**

The UO business school requires its M.B.A. students to participate in the Opportunity Planning Team Program (OPT), in which a team of four to five students develop strategic business plans for Northwest companies. OPT projects generally focus on emerging business opportunities such as the development of new products or services, expansion into new or emerging market segments, the exploration of opportunities for geographic expansion, the discovery of alternate distribution chains, or assisting in the formation of strategic business alliances.

Over the last five years, the OPT program has worked with ninety-seven Northwest companies, ninety-two of which have been located in Oregon. These businesses range from small Oregon firms such as Green Gear Cycling and Original Oatmeal Baking Company to large multinational firms including Nike and Intel. Although the OPT program does not charge for these strategic business plans, competing schools in the state that run similar programs charge companies between \$25,000 and \$40,000 for similar services. Based on the lower estimate, M.B.A. students have provided nearly \$2.5 million worth of value to Oregon businesses over the last five years. Forward-looking business plans are critical for the growth and diversification of the Oregon economy.

## **Resource Assistance for Rural Environments Program**

The Resource Assistance for Rural Environments Program (RARE) is designed to increase the capacity of rural communities to improve their economic, social, and environmental conditions. Many of these projects are ongoing across the state. For example, the RARE program is currently working in the cities of Stayton, Estacada, Clackamas, Falls City, and Waldport and for local agencies including Lincoln County Extension Service, Florence Community Development Office, Tillamook Coastal Watershed Resource Center, Coos Regional Trail Partnership, South Coos Opportunities, and Oregon Rural Development Council.

The RARE programs are coordinated with other Community Service Center activities such as Community Planning Workshops, Oregon Natural Hazards Workgroup, and the Community Outreach Partnership Center. Past projects have provided a wide range of services that include developing parks acquisition plans and a funding strategy for the city of Canby, assisting in the periodic review of Eagle Points Comprehensive Land Use Plan, the inventory of buildable lands in Gold Beach, working with Lane County to evaluate the financial education needs of low-income rural Lane County residents, and conducting a hazards vulnerability assessment and developing a detailed natural hazards mitigation action plan for Jackson County. Between 1997 and 2001, students from

the School of Architecture and Allied Arts have conducted over forty Community Planning Workshops. The value of these projects vary, and many of these rural Oregon communities have significant fiscal constraints that would have prohibited them from affording these services. Nonetheless, even if these projects were compensated at an extremely conservative value of \$10,000 each, the Community Planning Workshops would have generated over \$400,000 in value to rural Oregon communities.

## **Internship Programs**

Many departments on campus offer service-oriented internship programs that, for brevity, cannot be described in detail. However, examples of such programs include a new course offered by the economics department that has economics majors working with nonprofit organizations to conduct a cost-benefit analysis of competing projects to help them make the best use of their limited funds, or a long running course by the sociology department that has students working three to twenty hours in social services agencies (e.g., substance abuse, abused women shelters, Catholic Community Services, Birth to Three). All of these volunteer programs operate on the principle of applying knowledge and skills acquired in the classroom to assist the community at large. This synergistic relationship between the acquisition of real-world experience for UO students through the application of human capital in community service is a place where higher education can make a unique contribution to the state of Oregon.

## **Cultural Events and Programs**

UO students and faculty, in addition to their community service projects, build and enrich the community by sharing their talent and training in dance, theater, art, and music. A good example of the cultural contribution of the UO is its School of Music, which offers more than 200 recitals each year that are available to the public for free or well below market costs. In addition, the music program sponsors regional, national, and international music conferences, workshops, and masters classes with visiting artists such as Wynton Marsalis, Yo-Yo Ma, Philip Glass, Elly Smeling, and Eugene Rousseau. Each year the Chamber Music Series brings renowned ensembles such as the Guarneri, Tokyo, Juilliard, and Emerson String Quartets to perform on campus. The music school also sponsors several festivals, including the Oregon Bach Festival, Oregon Jazz Celebration, and Music Today Festival.

## **VII. UO's Impact Compared to Two Other Public Universities**

Public research universities share a common mission and are likely to have a similar impact on their region and state. To give some sense of how the UO compares to other public universities, the final section provides a relative comparison of the findings of economic impact reports recently completed by the University of Colorado and the University of California, Berkeley with those reported for the University of Oregon. The Educational Testing Service indicates that these institutions rank among the top ten public institutions for which UO applicants jointly apply. Thus, these institutions are direct competitors with the UO for undergraduate students.

## **Relative Economic Impacts**

Table 14 summarizes the direct and indirect effects of the Universities of Oregon, Colorado, and California, Berkeley on both expenditures and jobs. The figures in Table 14 show that the UO is significantly smaller

than both competing institutions in terms of direct expenditures and jobs. In particular, UO expenditures are 40 percent of those for UC Berkeley, and UO employment is 23 percent of that for the University of Colorado. Nonetheless, the relative effect of the UO on the state through its indirect impacts on expenditures and employment compare favorably to these competing institutions. For example, Table 14 shows that the UO generates \$9.89 in direct and indirect expenditures per dollar of state appropriations, whereas UC Berkeley and the University of Colorado respectively generate \$3.02 and \$10.86 in direct and indirect expenditures per dollar of appropriations. Alternatively, the UO generates a total of 113.3 jobs per million dollars of state appropriations in comparison to the 83.8 and 143.2 jobs generated by UC Berkeley and the University of Colorado per million dollars in their respective state appropriations.

**TABLE 14: COMPARISONS OF UNIVERSITY IMPACTS**

<i>Fiscal Year</i>	<i>University of Oregon</i> 2001	<i>UC Berkeley</i> 1999	<i>University of Colorado</i> 2000
<b>Spending</b>			
Direct Impact	\$351,490,415	\$842,479,835	\$1,159,631,420
Multiplier	2.00	1.67	1.90
Indirect and Induced Impact	\$351,490,415	\$564,461,489	\$1,043,668,278
<b>Total Impact</b>	<b>\$702,980,830</b>	<b>\$1,406,941,324</b>	<b>\$2,203,299,698</b>
<b>Total Impact per Dollar of State Appropriations</b>	<b>\$9.89</b>	<b>\$3.02</b>	<b>\$10.86</b>
<b>Jobs</b>			
Direct Jobs	3,754	21,550	16,139
Multiplier	2.15	1.81	1.80
Indirect and Induced Jobs	4,317	17,456	12,911
<b>Total Jobs</b>	<b>8,071</b>	<b>39,006</b>	<b>29,050</b>
<b>Jobs per Million Dollars of State Appropriations</b>	<b>113.30</b>	<b>83.75</b>	<b>143.20</b>

The differential impact on expenditures and employment by the UO, in part, reflects different assumptions regarding each university. For example, the UC Berkeley study was conducted for the local communities surrounding Berkeley and not for the state of California; this would tend to reduce the multiplier effect because more expenditures would tend to leak out of the local area than from the state as a whole. Alternatively, the relatively larger employment effect for the University of Colorado reflects the impact of the medical school that is partially funded with private funds; if the medical school is excluded from the employment calculations, then the University of Colorado generates slightly fewer jobs per million dollars of state expenditures than the UO.

Finally, the differential impact also reflects the relatively important role of higher education in smaller states like Oregon and Colorado. Large states like California can expect to attract graduates and benefit from the educational investments of other states because their large job markets generate a natural migration incentive. On the other hand, Oregon has a relatively small and less diverse job market and thus must rely more heavily on producing its own well-educated pool of workers. This is particularly important because workers who are educated in a state are more likely to remain in that state. Thus, the investment in the UO by Oregonians is likely to have a relatively higher return than similar higher education investments in larger states. Overall, the UO is a fundamental sound investment in Oregon's future.