

The statewide economic impacts of the UNIVERSITY OF MISSOURI



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Introduction to this report

The University of Missouri has provided teaching, research and service to the people of Missouri since it was founded in 1839 as the first publicly supported institution of higher education in the Louisiana Territory.

Founded in Columbia, the University had one campus until 1870, when a school of mines and metallurgy was established in Rolla. In the same year an agricultural college was added in Columbia as the University assumed land-grant responsibilities.

In 1963 the University expanded again. The University of Kansas City, which had been a private institution, was acquired and a new campus was built in St. Louis, creating the present four-campus system.

Today, the University of Missouri is one of the nation's largest higher education institutions with more than 63,000 students on four campuses and an Extension program with activities in every county of the state. The mission of the University, as a land-grant university and Missouri's only public research and doctoral-level institution, is to discover, disseminate, preserve and apply knowledge.

The University of Missouri (UM) is a large and complex organization which, in parallel with its academic mission, has significant influence on the state's economy. In this report we quantify the economic influence of each of the four campuses and the University as a whole. We measure UM's impact on Missouri's economy by calculating the total economic activity generated across the state through its various activities and operations. Some of this economic activity occurs inside UM in the form of direct expenditures and employment (called direct economic impact). Through such expenditures, additional economic activity is stimulated around the state (called indirect economic impact). Indirect expenditures include expanded economic activities of other businesses that service the University. Increased disposal income associated with UM's economic activities also translates into increased economic activity within the state (called induced economic impact). By using a standard economic model, we estimate UM's direct, indirect and induced economic impacts from its 2004 operations.

Much like other major research universities, UM generates additional economic impacts that are not quantified in this report. The University of Missouri contributes to the state's economic growth through the ongoing supply of skilled professionals and related improvements in labor productivity, as well as through technical innovation in the form of inventions, new products and spin-off companies. The University also improves the quality of life of Missourians through, among other activities, the volunteer work of its employees and students; world-class, and often uncompensated, health care services; a wide variety of athletic and cultural events; scientific conferences, workshops and seminars; library services and continuing education programs.

Economic operations of the University

Revenues

In 2004 the University generated over \$2 billion in revenues (Table 1). Of that, \$1.3 billion were operating revenues, which come largely from student fees, medical and other auxiliary services (e.g. student housing and bookstores), and research grants. The state's \$421 million appropriation adds to the operating revenues, bringing it to \$1.8 billion. The remaining revenues come from gifts and grants. In 2004 the state appropriation contributed 21 percent to the operating budget of the University. When the state appropriation is added to the other revenue sources that come from the state and its citizens (e.g. tuition, etc.), 81 percent of all revenues originate within Missouri. Conversely, 19 percent of revenues come from out of state sources in the form of federal grants, out-of-state student fees and private donations¹. As the largest entity, UM-Columbia generated almost half of the total revenues, followed by UM Health Care and UM-Kansas City.

TABLE 1. 2004 REVENUES BY SOURCE (THOUSANDS)

	UM- Columbia	University Hospital	UM- Kansas City	UM- Rolla	UM- St. Louis	Extension	Cross Campus Functions	UM TOTAL
Net Tuition	151,138	-	77,711	26,754	57,417	(6)	(1)	313,013
Federal grants	105,652	-	26,783	22,153	13,918	2,358	(322)	170,542
State grants	16,298	25	4,462	2,307	3,057	5,740	3,545	35,434
Private grants	26,736	1	11,562	12,459	4,740	464	(2,846)	53,116
Sales of service & education	13,689	-	1,837	329	737	10	38	16,640
Auxiliary	222,482	409,557	40,984	9,050	23,189	-	1,588	706,850
Notes receivable	264	-	284	809	223	-	-	1,580
Other	21,261	-	7,961	1,229	2,636	1,119	12,975	47,181
Total operating	557,520	409,583	171,584	75,090	105,917	9,685	14,977	1,344,356
State appropriation	179,682	22,555	73,383	44,401	46,428	20,138	34,667	421,254
Fed appropriation	6,759	-	-	-	-	7,843	-	14,602
Investment revenues	56,517	2,980	16,296	11,440	6,496	230	10,527	104,486
Private gifts	29,537	802	12,636	4,658	5,059	22	736	53,450
Interest expense	(8,751)	(10,208)	(1,438)	(805)	(2,861)	-	278	(23,785)
Other	(762)	-	(3)	(113)	(558)	-	(8)	(1,444)
State capital appropriation	52,440	-	1,799	-	-	-	-	54,239
Capital gifts	44,271	-	-	766	30	-	-	45,067
Private endowment gifts	11,851	2	2,887	871	2,881	10	4	18,506
Mandatory trans	459	-	94	(38)	(21)	-	(494)	-
Transfers	13,590	(9,101)	1,470	(485)	(392)	(4,077)	(1,090)	(85)
TOTAL OTHER	205,911	(15,525)	33,741	16,294	10,634	4,028	9,953	265,036
TOTAL REVENUES	943,113	416,613	278,708	135,785	162,979	33,851	59,597	2,030,646
In-state	720,212	416,140	211,759	94,090	126,072	23,170	62,331	1,653,774
Out-of-state	222,901	473	66,949	41,695	36,907	10,680	(2,733)	376,872
TOTAL	943,113	416,613	278,708	135,785	162,979	33,850	59,598	2,030,646

*Cross Campus Functions include: University Administration and University Wide Resources.

In 2004, the largest source of revenues for the UM system was from auxiliary services; however, this is predominantly generated by UM Health Care. If UM Health Care is excluded gross tuition is the largest source of revenue followed by state appropriations.

The \$2 billion in revenues places the University of Missouri among the top 30 largest public companies headquartered in Missouri. Even without state appropriations, the University remains in the top 30.

Operating expenditures

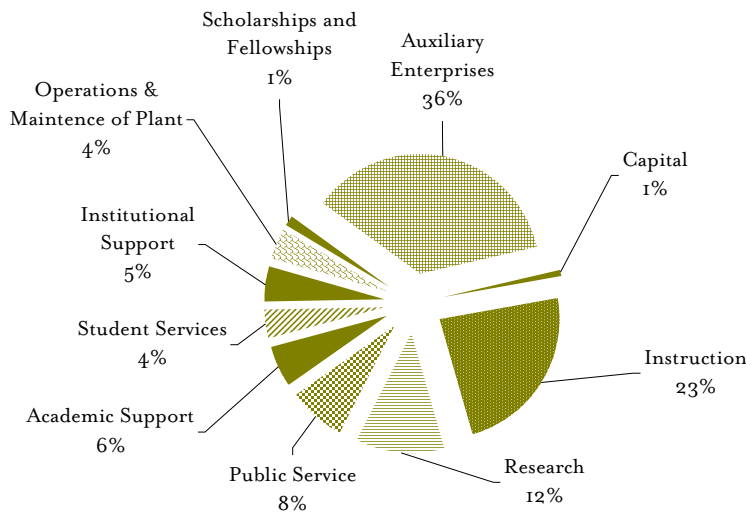
In order to perform its functions, the University incurred \$1.8 billion in operating expenses in 2004 (Table 2). The difference between the \$1.8 billion in total expenses and the \$2 billion in total revenues, \$0.2 billion, includes additions to

capital assets, endowments and other restricted funds, and unrestricted resources held in reserve. The latter may be used to fund future projects.

The \$1.8 billion in operating expenses do not exactly reflect cash outlays of the particular year, as capital projects are financed and depreciated over multiple years. For the purpose of evaluating UM's economic impact in a given year. University expenditures must be adjusted to reflect only the cash expended for expenses incurred in that particular year. Adjusting the budgets accordingly, the University expended \$1.72 bil-

lion in 2004 (Table 2). Breaking this down into the respective functions, 36 percent of expenditures were incurred for the offering of auxiliary (mainly medical) services. Instruction was the second largest expenditure followed by research, at 23 percent and 12 percent respectively (Figure 1).

FIGURE 1. ANNUALIZED² OPERATING EXPENSES BY FUNCTION IN 2004



As with most institutions in the knowledge economy, the main expenditure necessary to achieve these functions is worker wages and benefits, which accounted for over 64 percent of UM's direct expenses. Employee compensation totaled \$1.1 billion, an amount almost three times the state appropriation. Of this, the University expended \$214 million for employee benefits in 2004. As a portion of the benefits included in employee compensation, the University contributed \$48.5 million to its pension plan, which totaled over \$2 billion in 2004.

TABLE 2. ANNUALIZED OPERATING EXPENSES BY OPERATING UNIT IN 2004

	UMC	University Hospital	UMKC	UMR	UMSL	Extension	Cross campus functions	UM TOTAL
Salaries & Wages	423,779,746	156,610,326	143,691,815	68,940,865	82,935,826	20,999,292	22,460,157	919,418,027
Staff benefits	95,698,523	41,708,710	31,227,314	14,642,861	19,331,203	5,862,282	5,707,717	214,178,610
Supplies, services & other								
operating expenses	181,401,000	167,362,332	58,358,546	29,636,120	47,066,060	5,539,552	29,571,200	518,934,810
Scholarships & fellowships	13,292,000	6,780,000	1,847,000	3,836,000				25,755,000
Capital expense	17,668,403	56,893	12,455,016	4,877,279	3,165,738	117,430	3,797,214	42,137,973
TOTAL	731,839,672	365,738,261	252,512,691	119,944,125	156,334,827	32,518,556	61,536,288	1,720,424,420

Over 23,000 workers were employed by UM in 2004 (Table 3). The vast majority of these jobs are high-quality, full-time jobs that attract highly-educated professionals with specialized skills and knowledge.

The creation of high-quality jobs is a crucial part of the University's impact on Missouri, since jobs and wages are what drive the state's economic health. In 2004, the University of Missouri was the fourth largest employer in the state. Among non-governmental organizations, only Wal-Mart had a larger level of employment.

TABLE 3. UNIVERSITY EMPLOYEES IN 2004

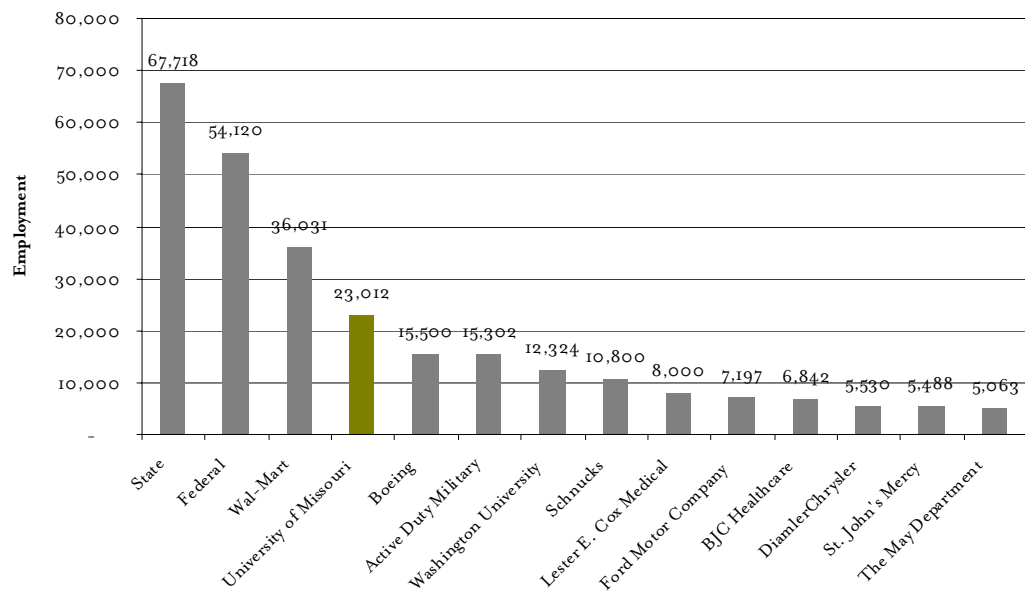
	UMC	UMKC	UMR	UMSL	UM	TOTAL
Total full-time faculty	2718	1094	366	489	3	4670
Total part-time faculty	1056	649	102	624	0	2431
Total full-time staff	8136	1376	720	894	486	11612
Total part-time staff	3387	434	128	305	45	4299
TOTAL FACULTY AND STAFF (excludes graduate assistants)	15297	3553	1316	2312	534	23012

State and federal government agencies topped the employment list.

The salaries and wages are, in turn, used by UM's employees for housing, food, entertainment, transportation and other living expenses, as well as taxes. Resulting expenditures and home purchases generate sales and property tax revenues for state and local governments. Over \$37 million in payroll taxes were withheld by the University in 2004.

Beyond the expenses that support its standard operations, the University spent \$194 million in new construction projects in 2003–2004. The most notable new construction projects at MU included Mizzou Arena, the Student Recreation Complex and the Christopher S. Bond Life Sciences Center.

FIGURE 2. MISSOURI EMPLOYMENT COMPARISON: GOVERNMENT & TOP 10 PRIVATE EMPLOYERS IN 2004



Calculating UM's impact on the state's economy

In the short run, economies are driven by demand for goods and services. Aggregate demand is the sum of consumption, investment, exports and government spending. UM attracts funding from both public and private sources, which adds to local and state aggregate demand. A relatively large portion of UM expenses go to pay wages and salaries, which in turn adds to consumption, investment and tax revenues. Thus, University expenditures, through this multiplier effect, increase economic activity significantly more than the value of the direct expenditures themselves.

Calculations of the statewide impacts of the University must take into account both the level and patterns of University spending. Accordingly, a statewide accounting model that describes how goods flow across sectors all the way to the final consumers (input-output model) is necessary.

Input-output (I/O) modeling was first developed in the late 1930s and has become widely used in regional economics since that time. I/O provides a framework for measuring the linkages among sectors or industries in a region's economy. The model is based on observed economic data for a specific geographic area (e.g. a county or state).

The flow of one sector's output to another sector reflects the *linkages* in the economy. With I/O modeling, there is a "fixed proportion" of inputs for each unit of output. Fixed proportions imply there are no substitutions between inputs, regardless of price changes or new technology. In addition, all the firms in a sector are assumed to need the same average mix of inputs. For example, if a sector called "construction" includes companies involved in residential housing and road construction, I/O assumes the same proportion of inputs, capital and labor are used in both types of companies. Fixed proportions also signify that small and large producers have the same input mix and efficiency in production. Another assumption in I/O modeling is "constant returns to scale." That is, in order for output to double, all of the inputs used in production must double.

There are several I/O models available to researchers today. One of the more popular models, and the model which is used in this study, is called IMpact Analysis for PLANning (IMPLAN). IMPLAN contains comprehensive national data that is used to estimate regional data on a county-by-county basis. This model allows the researcher to specify the geographic region of interest.

In the context of the I/O model there are three types of effects that account for the total economic impact of UM.

- *Direct effects:* These effects reflect spending and employment by UM itself in the local economy.
- *Indirect effects:* These are additional impacts created as UM expenditures cycle through the state economy. Because of the University's demand for goods and services, companies within the state create new jobs, increase their revenues, and purchase other goods and services as inputs in their own production processes.
- *Induced effects:* While direct and indirect effects measure the impacts of business-to-business interactions, induced effects are specific to the behavior of the labor force. UM employees and those of the related businesses spend their earnings in the local economy to purchase items such as food, transportation, housing and a variety of services. These purchases stimulate the economy and have their own multiplier effects.

TABLE 4. UNIVERSITY OPERATIONS' OUTPUT MULTIPLIERS⁵

	Direct	Indirect	Induced	Total
UM	1	0.3618	0.5888	1.9507
UM-Columbia	1	0.3419	0.6036	1.9455
UM-Rolla	1	0.3045	0.6326	1.9371
UM-Kansas City	1	0.2995	0.6368	1.9363
UM-St. Louis	1	0.3008	0.6356	1.9363
University Hospital	1	0.5177	0.4724	1.99

The rate at which the direct, indirect and induced effects impact the economy is often termed the multiplier or, simply, the amount \$1 directly spent in the economy changes the output in the economy. The multiplier used for the core functions of UM included 0.286 for indirect effects and 0.648 for induced effects, which with the original 1.0 direct effect totals 1.933³. As such, for every dollar spent by the University, \$1.933 is generated somewhere in the Missouri economy.⁴ However, the University has many different ac-

tivities that go beyond its core teaching and research functions (e.g. health care, public communications, etc.). Each of these activities has a unique multiplier, leading to differing multipliers across the four campuses. The resulting output multipliers for each UM campus are shown in Table 4.

We also calculate separate output and value-added impacts. Output impacts relate to the total sale of goods and services in the state, while value-added impacts include only the component of these goods and services that is value-added within the state. This distinction is important for economic impact analysis. For example, a merchandise retailer may generate a relatively high output (sales) value, because it oversees many transactions, but would have a much lower value-added impact because few of the products sold are produced within the state. The advantage of calculating value-added is that it is directly comparable to the Gross State Product, a value-added measure of the state's economic performance.

The impact of UM operations

In 2004, the University's operating and capital expenditures added up to almost \$2 billion. The various economic and employment impacts from such expenditures are presented in Table 5 (see next page). As this money passes through to businesses that support the University, \$692 million in indirect sales were added. Household spending afforded by wages tied to the Universities activities added another \$1.1 billion of induced impacts for a total impact of \$3.7 billion. Much of this impact is associated with the 36,750 jobs directly within the University and the 24,000 jobs that are associated with its impact on the broader economy⁶.

When only those transactions that occur within the state of Missouri are considered, the impact of the University reflects its true value-added. This value-added allows the University's impact to be put in the same context as the Missouri Gross State Product. Since the 2004 GSP was \$203.3 billion⁷ and the University had \$1.2 billion in direct impact, it was directly associated with 0.6 percent of Missouri's GSP. When its total 2.3 billion impact on the economy is aggregated, it is responsible for 1.1 percent.

These impacts are not distributed evenly across the state. Approximately 50 percent of the impact of the UM system is associated with the Columbia campus. The University Hospital had the second largest impact followed closely by the Kansas City campus.

Economic impact of University student spending

University student expenditures add to its statewide economic impact. As the University attracts a large number of students, their involvement in the local economy is important. In addition to tuition, students also pay for living expenses. Such expenses vary by the student's age and whether they live on- or off-campus. Using the estimated cost of living published by each campus for its students (adjusted for living choices such as car ownership), the average annual student expenditure (not including tuition) is \$12,848 over a student's nine-month residence. These expenditures are applied to the number of full-time equivalent students (Table 6)

TABLE 6. STUDENT FTES

	Undergraduate	Professional	Graduate	Total
UM-Columbia	18,978	1,048	2,974	23,000
UM-Kansas City	6,354	1,468	1,788	9,610
UM-Rolla	3,814	0	780	4,594
UM-St. Louis	7,736	165	1,263	9,164
TOTAL	36,882	2,681	6,805	46,368

**TABLE 5. UNIVERSITY IMPACT:
OPERATING EXPENDITURES & CONSTRUCTION**

	Direct	Indirect	Induced	Total
UM				
output	1,914,978,526	692,930,123	1,127,600,672	3,735,509,321
employment	36,750	9,724	14,643	61,117
value-added	1,218,572,269	477,920,995	682,894,260	2,379,387,524
UM-Columbia				
output	885,892,323	302,886,451	534,691,223	1,723,469,997
employment	19,760	4,774	7,464	31,997
value-added	651,677,685	236,383,234	348,078,660	1,236,139,579
UM-Rolla				
output	139,786,288	42,567,309	88,422,918	270,776,515
employment	2,766	574	1,071	4,411
value-added	88,190,990	27,068,995	49,932,369	165,192,354
UM-Kansas City				
output	257,603,051	77,159,631	164,040,699	498,803,381
employment	5,317	1,052	1,986	8,355
value-added	166,845,192	49,523,101	92,633,678	309,001,971
UM-St. Louis				
output	161,129,069	48,460,737	102,407,545	311,997,351
employment	3,368	658	1,240	5,265
value-added	104,102,133	31,152,686	57,829,475	193,084,294
University Hospital				
output	376,512,950	194,901,973	177,854,809	749,269,732
employment	3595	2296.3	2153.6	8,045
value-added	145,643,422	116,410,036	100,434,507	362,487,965
Extension				
output	32,518,556	9,288,174	21,060,893	62,867,623
employment	683.6	129	255	1,068
value-added	21,630,180	5,995,779	11,893,072	39,519,031
Cross Campus Functions				
output	61,536,289	17,665,848	39,122,585	118,324,722
employment	1,261	242	474	1,976
value-added	40,482,667	11,387,164	22,092,499	73,962,330

to determine the total expenditure⁸.

The total student expenditures are further broken down to account for their buying behavior and patterns. The most recent data for such spending patterns was provided in a 1997 study for student spending at UM-Columbia⁹. The student expenditures that occur off-campus are added to the expenditures of each campus to determine the total expenditure associated with University activity. Assuming that all student purchases are made within the state, students' non-tuition spending adds \$517 million to the University's total impact (Table 7).

TABLE 7. NON-TUITION STUDENT SPENDING AT ALL UNIVERSITY OF MISSOURI CAMPUSES

	Off-campus expenditures	On-campus expenditures	Total
Housing & food	252,092,756	53,462,634	305,555,390
Transportation	166,846,964		166,846,964
Entertainment	36,718,017		36,718,017
Apparel & upkeep	32,683,070		32,683,070
Health care	19,771,240		19,771,240
Personal care	5,043,684		5,043,684
Books & reading	3,631,452	25,508,221	29,139,673
Total	516,787,182	78,970,855	595,758,036

Note: Totals calculated on student FTEs but assumes that all students either live on-campus or off-campus where they pay rent (i.e. do not live with parents).

When student expenditures are added to the operating and construction impact, the magnitude increases significantly. The University of Missouri's direct impact jumps to \$2.4 billion, and its total impact on the state jumps to \$4.6 billion (Table 8). This total impact accounts for 68,000 Missouri jobs and 1.3 percent of GSP.

Student expenditures also play a significant role in how the University's impacts are distributed across the state. While the Columbia campus still accounts for much of the University's economic impact on the state, that impact decreases to 46 percent of the total. The relative impact of the Kansas City, Rolla and St. Louis campuses all increase due, in part, to their proportionally large student populations. In fact, with student expenditures in the equation, the Kansas City campus becomes the second largest operating unit in terms of economic impact.

**TABLE 8. UNIVERSITY IMPACTS:
OPERATING EXPENDITURES, CONSTRUCTION &
STUDENT NON-TUITION EXPENDITURES**

	Direct	Indirect	Induced	Total
UM				
output	2,431,765,710	873,443,582	1,316,051,230	4,621,260,522
employment	41,356	10,879	15,936	68,170
value-added	1,396,832,566	539,906,167	743,173,416	2,679,912,149
UM-Columbia				
output	1,107,683,476	380,230,669	616,396,284	2,104,310,429
employment	19,760	4,774	7,464	31,997
value-added	651,677,685	236,383,234	348,078,660	1,236,139,579
UM-Rolla				
output	182,001,773	57,345,329	104,053,398	343,400,500
employment	3431.7	738.8	1260	5,431
value-added	113,654,995	35,967,441	58,758,898	208,381,334
UM-Kansas City				
output	402,043,357	127,668,289	216,139,595	745,851,241
employment	7569.7	1617	2617	11,804
value-added	254,149,333	79,859,960	122,053,911	456,063,204
UM-St. Louis				
output	269,469,309	86,343,300	141,423,666	497,236,275
employment	5055.9	1082	1712.5	7,850
value-added	169,594,284	53,902,553	79,861,869	303,358,706
University Hospital				
output	376,512,950	194,901,973	177,854,809	749,269,732
employment	3595	2296.3	2153.6	8,045
value-added	145,643,422	116,410,036	100,434,507	362,487,965
Extension				
output	32,518,556	9,288,174	21,060,893	62,867,623
employment	683.6	129	255	1,068
value-added	21,630,180	5,995,779	11,893,072	39,519,031
Cross Campus Functions				
output	61,536,289	17,665,848	39,122,585	118,324,722
employment	1,261	242	474	1,976
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Impact of financial inflows from outside the state

It is important to delineate the portion of the statewide impact attributed to the spending that results from resources coming from outside the state. The University is the recipient to significant financial inflows from outside the state, creating much impact that would not exist in the absence of the University. These inflows consist of federal appropriations, contracts granted from federal and private sources, and out-of-state student tuition and living expenditures, as well as visitor spending. The University's ability to draw money into the state economy only serves to increase its importance to the state.

The share of the 2004 University operating budget that came from outside the state was 19 percent of UM's total revenue (Table 9). This money comes largely from tuition, federal appropriations, grants and gifts.

UM draws a large population of students to the state. During their tenure, these students support the local economy by spending on tuition and non-tuition living expenses. In addition, a percentage of students make Missouri their permanent home, further benefiting the state's economy.

In 2004, 13,267 students came from outside Missouri, comprising 21 percent of the total University population. The Rolla campus, with 32 percent, had the largest proportion of out-of-state students, followed by Kansas City and Columbia.

TABLE 9. OPERATING REVENUES BY GEOGRAPHIC ORIGIN (THOUSANDS)

	In-state	Out-of-state	Total	Out-of-state
UM-Columbia	720,212	222,901	943,113	24%
University Hospital	416,140	473	416,613	0%
UM-Kansas City	211,759	66,949	278,708	24%
UM-Rolla	94,090	41,695	135,785	31%
UM-Saint Louis	126,072	36,907	162,979	23%
Extension	23,170	10,680	33,850	32%
Cross Campus Functions	62,331	-2,733	59,598	-5%
TOTAL	1,653,774	376,872	2,030,646	19%

TABLE 10. STUDENT POPULATION BY GEOGRAPHY IN 2004

	Bachelor	Professional	Graduate	Total
UM-Columbia				
In-state	17,309	903	2,813	21,025
Out-of-state	3,574	166	2,238	5,978
Total	20,883	1,069	5,051	27,003
UM-Kansas City				
In-state	7,505	973	1,948	10,426
Out-of-state	1,888	521	1,421	3,830
Total	9,393	1,494	3,369	14,256
UM-Rolla				
In-state	3,188	0	495	3,683
Out-of-state	931	0	790	1,721
Total	4,119	0	1,285	5,404
UM-St. Louis				
In-state	11,491	70	2,199	13,760
Out-of-state	1,081	95	562	1,738
Total	12,572	165	2,761	15,498
UM TOTAL				
In-state	39,493	1,946	7,455	48,894
Out-of-state	7,474	782	5,011	13,267
Total	46,967	2,728	12,466	62,161

Based on standard spending patterns outlined in previous sections, these students spent in excess of \$190 million in 2004 alone. Fifty-eight percent of these purchases were in the form of living expenses and 41 percent were associated with tuition.

In addition to those expenditures directly related to the University, visitors also have an impact on the state and local economies. In any given year, UM draws many visitors who come for a variety of reasons such as cultural and athletic events, campus tours, commencements and other special events. Those visitors spend

money on food, lodging, transportation and entertainment. Since it is difficult to determine the number of visitors that attend the diverse events offered by the University of Missouri, and even more difficult to determine the geographical origin of those visitors, the impact of visitor spending is not be included in this report, although it is expected to be significant to the state and the local economy.

TABLE 11. EXPENDITURES BY OUT-OF-STATE STUDENTS

	Non-Tuition Expenditures	Net-Tuition	Total
UM-Columbia	47,985,681	35,458,613	83,444,294
UM-Kansas City	39,017,263	24,684,466	63,701,729
UM-Rolla	13,100,885	7,870,024	20,970,909
UM-St. Louis	12,380,791	7,859,021	20,239,812
UM TOTAL	112,484,621	78,968,328	191,452,949

Impact of out-of-state financial inflows

There are few industries or economic activities that as effectively leverage state investments into out-of-state financial inflows and added revenues and employment as the University of Missouri. In 2004 alone, \$489 million in out-of-state money rippled through the state economy, creating almost \$1 billion in total sales and supporting 16,400 jobs (Table 12). For every dollar of state appropriations, the University directly brings \$1.16 into the state's economy and generates \$2.19 in economic activity.

Within the University, Extension had the highest percentage of funds coming from out-of-state sources, followed closely by UM-Rolla. However, the vast majority of financial inflows can be attributed to the activities of the four University campuses, with 56 percent coming from the Columbia campus alone.

TABLE 12. UNIVERSITY IMPACT OF OUT-OF-STATE MONEY
(out-of-state tuition, out-of-state funding,
out-of-state non-tuition student expenditures)

	Direct	Indirect	Induced	Total
UM				
output	489,356,614	147,103,053	284,901,928	921,361,595
employment	10,557	2,128	3,740	16,425
value-added	318,496,067	93,198,804	160,883,948	572,578,819
UM-Columbia				
output	270,886,674	80,456,953	161,940,151	513,283,778
employment	5,439	1,072	1,961	8,472
value-added	177,234,973	51,198,201	91,447,504	319,880,678
UM-Rolla				
output	54,795,886	16,493,776	31,815,324	103,104,986
employment	2,016	418	695	3,129
value-added	35,641,472	10,446,102	17,966,095	64,053,669
UM-Kansas City				
output	105,966,262	32,765,602	57,418,207	196,150,071
employment	1,962	408	675	3,045
value-added	68,117,273	20,537,685	32,424,030	121,078,988
UM-St. Louis				
output	49,287,792	14,870,619	28,358,837	92,517,248
employment	969	195	343	1,507
value-added	32,033,837	9,404,476	16,014,218	57,452,531
University Hospital				
output	473,000	246,227	222,473	941,700
employment	5	3	3	10
value-added	182,452	147,071	125,630	455,153
Extension				
output	10,680,000	3,050,494	6,916,984	20,647,478
employment	225	42	84	351
value-added	7,103,954	1,969,180	3,906,016	12,979,150
Cross Campus Functions				
output	-2,733,000	-780,618	-1,770,048	-5,283,666
employment	-58	-11	-21	-90
value-added	-1,817,894	-503,911	-999,545	-3,321,350

Other statewide economic benefits of UM

The University of Missouri provides an education that enriches the lives of hundreds of thousands of Missourians. More directly, the University keeps its education programs accessible to all students. In FY 2005, \$548,782,618 in grants, loans, work programs, scholarships, fellowships and other aid was awarded to 50,167 students.

Providing Missouri's youth with an education has a large impact on the welfare of the state's workforce. The state benefits from a skilled workforce, higher-paying jobs and improved quality of life. The University also serves to help attract and retain the best and the brightest students to the state, ensuring that Missouri continues to expand its human capital.

Perhaps the most clearly calculable benefit associated with an educated labor force is the increase in work-life earnings of students with degrees. While workers with only a high school degree have an average work-life salary of \$26,000 per year, those with bachelor's degrees have an average work-life salary of \$45,000 per year. This higher wage earning capacity shows that the average worker with a bachelor's degree can expect to earn \$700,000 more than their counterpart with a high school diploma over their work-life (after the costs of education are accounted for). The benefits of more advanced degrees are even more significant.

TABLE 13. STUDENT SALARY RETURNS TO EDUCATION

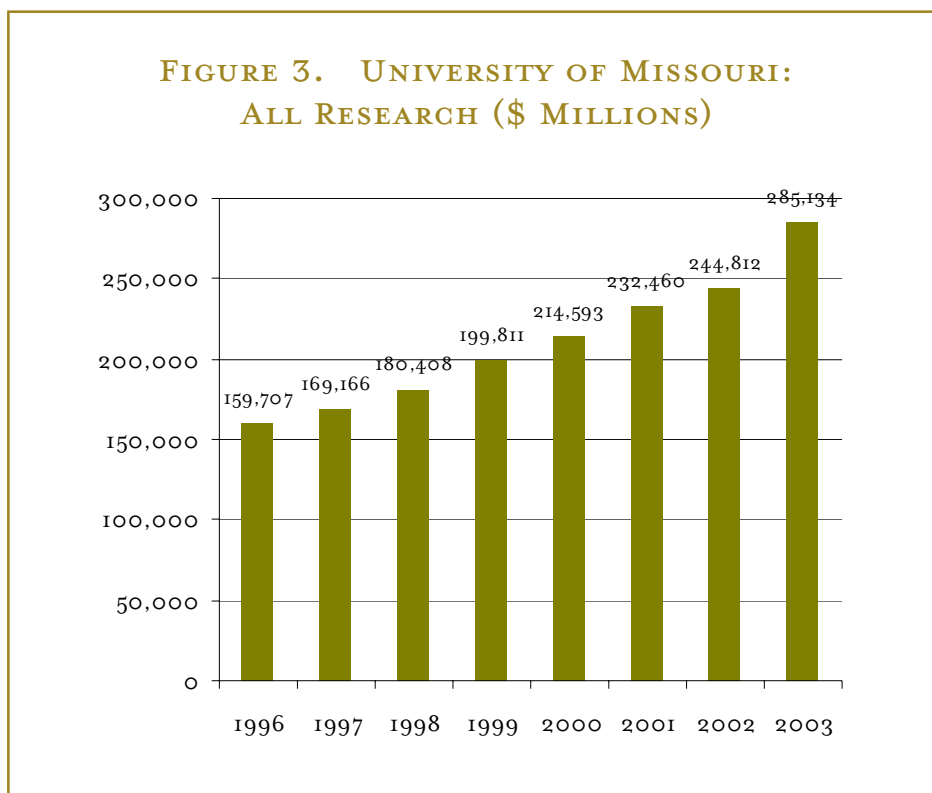
	No high school diploma	High school diploma	Some college	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree	Professional Degree
Annual Work Life Salary*	18,894	25,909	31,192	33,020	45,394	54,537	81,430	99,253
Per Capita Lifetime Net Benefit From Education			212,562	259,083	716,029	989,490	1,831,892	2,364,448

*Source: *The Big Payoff: Educational Attainment and Synthetic Work-Life Earnings* U.S. Census Bureau 2002.

With nearly 13,000 students graduating from the University of Missouri, the benefits are significant. The total lifetime benefit for the 2004 Missouri graduating class is \$11.65 billion. After accounting for those students that will choose to leave the state after graduation, the benefits still exceed \$6.5 billion in total lifetime wage benefits.

The role of UM's research to the Missouri economy

Research is one of the University's core activities that has a significant capacity for generating new, out-of-state financial resources in the form of grants and contracts. Research is becoming an increasingly important component of the University model. UM has increased rapidly its research funding and expenditures year after year (Figure 3). In 2003, the University spent almost \$285 million on research efforts. Over 40 percent of that research was funded directly from federal sources. An equal amount was attributed to institutional sources. Only 8 percent came directly from state and local governments.



The University of Missouri-Columbia is the site of the majority of the University's research effort, with over \$205 million in expenditures in 2003 (Table 14).

At UM-Columbia, recent major research awards include: \$10.4 million for a National Swine Research and Resource Center; \$10 million for a Cancer Imaging Center; \$10 million for the National Center for Math Education; \$8.5 million for the Thompson Family Center for Autism and Neurodevelopmental Disorders; \$8.5 million for a Regional Biosafety Research Lab; \$5.4 million for the Food Stamp Nutrition Education Program; and \$4 million to develop the Mis-

souri Arthritis Rehabilitation Research and Training Center.

Much of the funding for research is dependant on competitive federal and private grants, making research expenditures largely new money to the economy.

UM expends \$285 million on research trickling through the economy, ultimately being associated with \$533 million in sales and 6,552 jobs (Table 15).

Of course, beyond the short-term impacts associated with the year-to-year expenses in research activities, there are long-term effects associated with knowledge spillovers. These spillovers often translate innovations into new products, services and entrepreneurial ventures, many of which locate inside the state and add to the University multiplier effect.

TABLE 14. RESEARCH EXPENDITURES (\$ THOUSANDS)

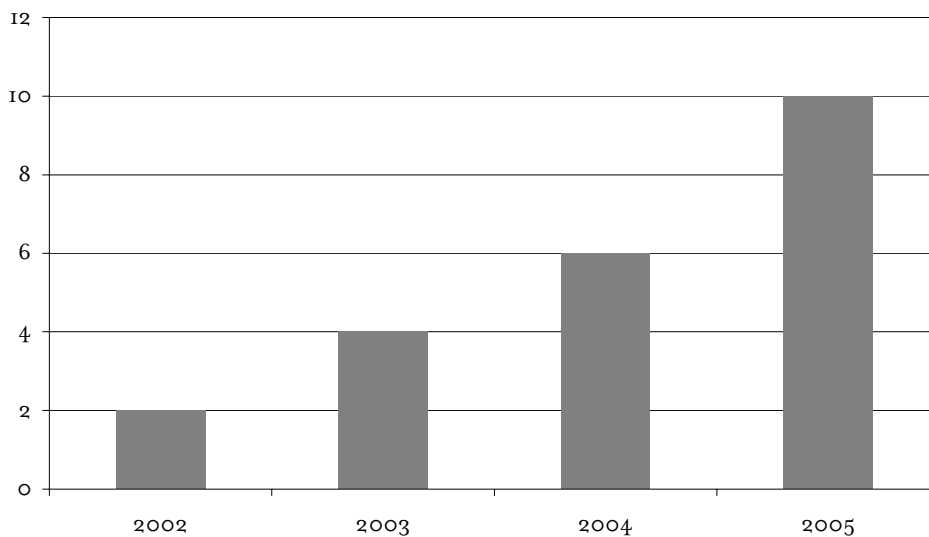
	2000	2001	2002	2003
UM-Columbia	158,861	174,782	177,011	205,212
UM-Rolla	25,968	28,799	32,222	35,999
UM-Kansas City	19,647	18,795	24,060	31,104
UM-St. Louis	9,898	10,084	11,519	12,819
Total UM	214,374	232,460	244,812	285,134

TABLE 15. IMPACT OF RESEARCH EXPENDITURES ON MISSOURI ECONOMY

	Direct	Indirect	Induced	Total
UM				
output	285,134,016	19,694,780	228,493,866	533,322,662
employment	3,547	238	2,767	6,552
value-added	240,700,704	12,111,778	129,030,442	381,842,924
UM-Columbia				
output	205,212,000	14,174,409	164,447,876	383,834,285
employment	2,553	171	1,991	4,715
value-added	173,233,184	8,716,894	92,863,684	274,813,762
UM-Rolla				
output	35,999,000	2,486,552	28,848,016	67,333,568
employment	448	30	349	827
value-added	30,389,166	1,529,146	16,290,469	48,208,780
UM-Kansas City				
output	31,104,000	2,148,416	24,925,378	58,177,794
employment	387	26	302	715
value-added	26,256,968	1,321,220	14,075,356	41,653,544
UM-St. Louis				
output	12,819,000	885,434	10,272,583	23,977,017
employment	160	11	124	295
value-added	10,821,376	544,519	5,800,926	17,166,821

UM has continued in recent years to streamline its technology transfer operations to facilitate technological spillovers. Similarly, legislators and local business leaders have generally looked at technology startups as a significant economic opportunity for the state. Such startups tend to attract high-paying, skilled jobs and a growth opportunity, as technology is ever important to the economic sector. In the last few years, UM has increased the number of new company foundations dramatically to 10 startups in 2005 alone (Figure 4).

FIGURE 4. NEW COMPANY STARTUPS ORIGINATING AT THE UNIVERSITY OF MISSOURI



COMPANIES ORIGINATING AT THE UNIVERSITY OF MISSOURI, 2002–2005:

Inovatia Laboratories, LLC • Renewable Alternatives, LLC • Adelante Community Journalism & Education Foundation • PhytoSynergy, LLC • AgBotanica, LLC • Zarchivist, Inc. • NEMS & MEMS Works, LLC • PatientSafetyNetwork, LLC • AndroLogika, LLC • The McBride Group LLC • Osmium Entertainment LLC • Heat Pipe Research Institute, LLC • Purple Tree Technologies Inc. • Life After Sports, Inc. • Varsity Media Productions, LLC • Thermal Ventures, LLC • Romeo USA, LLC • Mid-America Cyclotron, Inc. • Pinnacle Biological, LLC • Picture Cloud LLC • Columbia Biomaterials LLC • Stealth Biomedical LLC

Concluding comments

The University of Missouri is a major participant in the state's economy. In 2004 it generated over \$2 billion in revenues and spent nearly that amount, leading to the employment of 23,000 faculty and staff, as well as the education of 63,000 students. The funds earmarked for UM provide a number of important services, from instruction to research to medical care and entertainment. Its economic activity and level of employment place the University among some of the largest corporations headquartered in Missouri, and as one of the top employers of Missourians. In fact, few other industries play such a large role in the state. While a number of private businesses may be larger in terms of revenues collected (both from inside and outside the state), few of them create as much in-state economic activity (value-added) as the University of Missouri.

In 2004 the University had a total impact of \$3.7 billion on the Missouri economy. UM supported 24,000 jobs in addition to those inside the University. This total impact accounted for 1.1 percent of Missouri's \$203.3 billion gross state product. When the expenditures of UM's students are included, its role increases to 1.3 percent of the state's economy. The 68,000 direct, indirect and induced jobs represent approximately 2.0 percent of state jobs.

While the University plays a large role in the state, it also is a good investment. It draws nearly \$500 million dollars into the Missouri economy from outside sources, including federal grants, private donations and out-of-state tuition. This money circulates through the economy, ultimately creating nearly \$1 billion in economic activity and accounting for 16,400 jobs.

Perhaps even more important than the short-term, tangible economic impacts of the University are the long-term, intangible benefits that are generally difficult to quantify. The most calculable of these benefits is the improved earning potential of UM graduates. The 2004 graduating class alone benefited from potential lifetime wage benefits of \$11.6 billion, and the Missouri economy stands to benefit from the \$6.5 billion associated with those graduates who stay in the state. Finally, UM adds immeasurably to the quality of life of all Missourians. Lifelong learning, arts and culture, sports, and a sense of place are all enhanced and provided at minimal cost by Missouri's leading public university.

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ENDNOTES

¹ Because the 2004 private donations are not reflective of the usual distribution of in-state and out-of-state sources, the average of 2003–2005 is used.

² For the purpose of this impact analysis University financial statements must be adjusted to consider only (and all of) those expenditures that occurred in the specified year. As such the annualized figures used in this study stray from reported University finances by the elimination of temporal issues such as financing and depreciation.

³ Multipliers for core University expenditures were based on the IMPLAN sector for colleges, universities and junior colleges. In comparison the sector that directly accounts for state education also includes primary and secondary education as well as many other non-relevant state functions. It is generally believed that this sector for (private) colleges and universities is more indicative of expenditure patterns of state universities.

⁴ This is a net addition to the state economy only if it is assumed that the human and financial resources would not have been used elsewhere in the state if UM did not operate. This would be true if, for example, all university activities currently associated with UM would have occurred out-of-state if UM did not exist.

⁵ These multipliers represent state-level weighted averages of IMPLAN multipliers for various activities. Since each campus and extension has a different mix of activities these multipliers differ. The differences do not reflect the different locations of expenditures within the state.

⁶ Multipliers for wages and salaries of employees of UM are allocated based on the employee income profile for Missouri colleges, universities and junior colleges.

⁷ Missouri Department of Economic Development. (<http://www.ded.mo.gov/researchandplanning/indicators/gsp/index.stm>)

⁸ St. Louis and Kansas City maintain a much higher percentage of part-time students than either Columbia or Rolla.

⁹ Ed Robb. 1998. *Economic Impact Study of Higher Education on Columbia*.

