



The Economic Impact of the University of Maryland, Baltimore FY 2005

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Executive Summary

The University of Maryland, Baltimore is the flagship public provider of health and professional educational services in Maryland. The University impacts the State of Maryland in many ways. The University is a major source of economic activity through its purchases of goods and services from Maryland suppliers and the salaries it pays to its Maryland workforce. The University also plays a vital role in providing a skilled and educated workforce, and is the only provider of educational services in several key areas. Finally, the University supports economic development in the State through the commercialization of new technologies.

The economic impacts of the University are presented in the Summary Table below. This study used two alternative methodologies to estimate the economic impacts of the University. The *Upper Bound* estimate assumes that there are no effective in-State substitutes for the educational services provided by the University, while the *Lower Bound* estimate adjusts for the potential substitution by other Maryland universities for these services. Using the *Upper Bound* estimate the total impact of the University of Maryland on the Maryland economy is nearly \$2 billion in increased economic activity with an associated 19,427 jobs earning \$452 million in salaries and wages. Using the *Lower Bound* estimate the total impact of the University of Maryland on the Maryland economy is over \$1.6 billion in increased economic activity with an associated 16,767 jobs earning \$776.5 million in salaries and wages.

Summary Table
Economic Impact of University of Maryland, Baltimore
on the State of Maryland (FY 2005)

Item	Upper Bound			Lower Bound		
	Direct	Indirect	Total Impact	Direct	Indirect	Total Impact
Economic Output (Mil. \$)	879.4	1,067.8	1,947.3	743.5	906.9	1,650.4
Employment (# of Jobs)	6,031	13,396	19,427	4,985	11,782	16,767
Earnings (Mil. \$)	879.4	447.5	452.4	398.5	378.0	776.5
Fiscal Impact (Mil. \$)	21.6	21.9	43.5	19.3	18.3	37.5

Source: University of Maryland and The Jacob France Institute

The economic impacts presented above are made possible by the support provided to the University by the State. However, the University leverages its State appropriations by attracting new research funding, students, and visitors into Maryland. Thus, using the *Upper Bound* impact estimate, the University of Maryland, Baltimore generates \$14.59 in economic impact for each \$1 appropriated and using the *Lower Bound* impact estimate, the University of Maryland, Baltimore generates \$12.36 in economic impacts for each \$1 appropriated.

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1.0 University of Maryland, Baltimore Expenditures, Employment, and Employee Earnings in Maryland

The University of Maryland, Baltimore impacts the Maryland economy through four primary spending flows:

- 1) the operating expenditures of the University and its affiliated institutions;
- 2) the spending of the University's students;
- 3) the spending of the visitors attracted into the State by the University; and
- 4) the construction expenditures of the University.

As presented in Table 1, in fiscal 2005, the University, its affiliated institutions, its students, and the out-of-state visitors attracted into Maryland by the University spent a total of \$999.6 million. The University and its affiliated institutions employed 6,031 workers who earned \$476.6 million in salaries and wages.

Table 1
Total Expenditures, Employment, and Payroll Associated
with the University of Maryland, Baltimore and its Affiliated
Institutions (Fiscal 2005)

Item	
Total Expenditures (Mil. \$)	<u>999.6</u>
Total Operating Expenditures	667.4
Student Expenditures	106.5
Visitor Expenditures	16.9
Construction Expenditures	101.5
University of Maryland Foundation	19.5
MSP/UPI	87.8
Total Employment (Number of Jobs)	6,031
Total Payroll and Fringe (Mil. \$)	476.6

Source: University of Maryland, Baltimore

These expenditure and employment figures, however, do not represent the actual total impact of the University on the State of Maryland for two reasons:

- 1) Some of these expenditures would occur in Maryland in the absence of the University; and
- 2) Some of the expenditures associated with the University represent spending that would otherwise not occur in the State in the absence of the University, and this spending has “spin-off” or “multiplier” effects.

This report begins with a brief description of the methodology used to estimate the economic impact of the University and then goes on to calculate the economic, employment, and fiscal impacts of the University.

This report analyzes the impact of the University of Maryland, Baltimore on the State’s economy using economic multipliers, which describe the response of an economy to a change in demand or production.¹ The first step in the modeling process is to estimate the direct effects, or the changes in final demand, in the affected industries. Direct effects must represent new spending in Maryland, or spending that would otherwise not occur in the absence of the project or event being analyzed, in this case the educational, patient care, and research operations of the University of Maryland, Baltimore. Once these direct effects are estimated, they can be entered into an economic model to determine the change in economic output (a measure similar to gross national product (GNP) which measures the level of economic activity in a region), employment, and earnings attributable to the University of Maryland, Baltimore.

In computing the direct economic effects of the University, this study uses an "economic base analysis" approach to estimate the economic impacts on the State of Maryland.² In such an analysis, industries can be divided into export-oriented industries (those that produce or compete for goods or services for sale outside of the region) and local market-oriented industries (those that produce goods or services for sale within a region). Local market-oriented industries can also be import-substituting, or industries that decrease the importation of goods or services. Export-based and import-substituting industries can be viewed as exogenous demand industries³ and have "multiplier effects." Multiplier effects occur as an initial round of exogenous spending is spent and then re-spent in the state economy. For example, the University pays a worker a salary or purchases goods or services from a local company, a portion of which is then spent on purchasing other goods and services from Maryland companies that in turn becomes income for other workers and supplier firms. Thus, each dollar of new spending creates more than one dollar in economic impact, as that spending is earned and, in turn, spent by others in the State.

¹ The Jacob France Institute used the RIMS-II Economic Model developed by the Bureau of Economic Analysis.

² This analysis draws on methods used to analyze the impact of all public institutions of higher education on the State of Kentucky and the economic impact of the University of Colorado on the State of Colorado. See Charles Haywood, Analysis of the Annual Economic Impacts in Kentucky of the State's Public Institutions of Higher Education, University of Kentucky, 1993 and the Office of Central Administration & Analysis, University of Colorado Economic Impact Study, University of Colorado, 1996.

³ Exogenous demand industries are industries impacted by economic conditions outside of the region being studied.

This analysis presents two estimates of the direct economic effects of the University.⁴ The first estimate is based on a conservative estimate of exogenously determined demand for the educational services provided by the University of Maryland, Baltimore. This *Lower Bound* estimate is based on the assumption that the University is at least partially substitutable by other institutions of higher education within the State. The second - *Upper Bound* - estimate assumes that the University has no reasonable substitution possibilities within the State. With this assumption, if the University of Maryland, Baltimore did not exist, all of its students would need to leave Maryland to obtain a similar educational experience, and thus, all of the University's economic activity is exogenously determined. **Given that the University is the public provider of health and professional educational services and, in fact, has no in-State competition in many of its key program areas, the *Upper Bound* is a reasonable estimate of the economic impact of the University.**

The *Lower Bound* estimate is based on the assumption that the University's economic impacts are exogenously determined only to the extent that students would need to leave Maryland to find a similar educational experience. A student survey was conducted of students in the University of Maryland, Baltimore's School of Law, School of Nursing, and School of Social Work on their willingness to attend another university in Maryland if they did not attend the University of Maryland, Baltimore. Thirty-six percent (36%) of School of Social Work, 50% of School of Nursing, and 83% of School of Law students said that they would leave Maryland for their education if they were not enrolled in the University of Maryland, Baltimore. The University of Maryland, Baltimore Dental School and the School of Pharmacy are the only programs of their kind in Maryland and, thus, there are no educational substitutes for the educational service they provide. Furthermore, it was determined in consultation with University administrators that there was only limited competition for students between the University of Maryland, Baltimore School of Medicine and the only other medical school in Maryland, Johns Hopkins University. Thus, there are negligible in-state substitution opportunities for the educational services provided by these schools.

The *Lower Bound* estimate was derived by calculating the estimated loss in full-time student enrollment in Maryland that would occur if the University of Maryland, Baltimore did not exist. For the School of Law, School of Nursing, and School of Social Work, full-time resident student enrollment was multiplied by the substitution factors identified in the survey.⁵ Zero substitution effects were applied to non-resident student enrollment on the grounds that these students were attracted into Maryland by these three schools. Furthermore, as described above, zero substitution effects were applied to the Dental School, School of Medicine, and School of Pharmacy. The results of these calculations were used to derive adjustment factors used to compute the *Lower Bound* spending estimate. The adjustment factors used are presented in Table 2.

⁴ The *Upper Bound* and *Lower Bound* estimation methodology used in this report is drawn from the University of Colorado Economic Impact Study, *Op Cit.*, pp. 4-8.

⁵ The survey-based substitution factors were 36% for the School of Social Work, 50% for the School of Nursing, and 83% for the School of Law. These factors were only applied to in-State resident students. Out-of-State students were assumed to be attracted into Maryland by the strength of UMB's programs. Thus, the adjustment factors presented in Table 2 differ from the survey results because they are the result of the multiplication of the survey-based substitution factor to in-State students plus the full substitution of out-of-State students.

Table 2
Lower Bound Student Enrollment Changes
and Adjustment Factors

	% Exogenously Determined Enrollment	Adjustment Factor
School of Dentistry	100%	1.00
School of Law	88%	0.88
School of Medicine	100%	1.00
School of Nursing	57%	0.57
School of Pharmacy	100%	1.00
School of Social Work	46%	0.46
<i>University Average</i>	<i>81%</i>	<i>0.81</i>

Source: University of Maryland and The Jacob France Institute

A different methodology was used to estimate the level of expenditures associated with the University of Maryland, Baltimore’s Medical Service Plan/University Physicians Incorporated (MSP/UPI) to include in this analysis. MSP/UPI are the health care services operations of the medical school faculty. The *Upper Bound* estimate includes all of the expenditures associated with MSP/UPI. The *Lower Bound* estimate includes all of the expenditures associated with medical school faculty, UPI general expenses, and the 11% of general staff and operating costs that are associated with out-of-state patients, and the 18.8% of general staff and operating costs associated with Maryland patients receiving tertiary and quaternary care. For the *Lower Bound* estimate, out-of-state patients are considered as exogenous demand because they were attracted into the State by the reputation of the medical school faculty, and Maryland patients receiving tertiary/quaternary care are included because these patients would likely need to leave Maryland to receive comparable medical treatment.

In order to assess the economic importance of the University of Maryland, Baltimore to the Maryland economy, this report analyzes only net new, exogenously determined expenditures in the State economy. Net new expenditures represent spending that would otherwise not occur in Maryland if the University of Maryland, Baltimore did not exist. The *Upper Bound* and *Lower Bound* expenditures are presented by major expenditure type in Table 3 and by school in Table 4. As described above, the *Upper Bound* spending figures include the total expenditures of the University and its affiliated institutions. The *Lower Bound* spending figures represent the portion of University and affiliate spending that is exogenously determined. This was calculated by multiplying the expenditures associated with each of the six University of Maryland, Baltimore schools by the adjustment figure in Table 2 and adjusting the MSP/UPI spending to include only exogenously determined expenditures. The types of spending analyzed in this study are as follows:

University Operating Expenditures include University payroll paid to employees residing in Maryland and purchases made from suppliers in the State of Maryland. Student salaries and

wages were subtracted from total operating expenditures because these would be captured in student expenditures (described below). The majority of these expenditures are derived from the revenues associated with research contracts, tuition and fees, and charitable contributions, which are attracted into the State by the University. These expenditures by the University comprise the major share of university-related expenditures in Maryland, and at \$553.8 million account for 63% of the *Upper Bound* and 70% of the *Lower Bound* expenditures (\$519.5 million).

Student Expenditures represent the living expenses of University of Maryland, Baltimore full-time students. Part-time students are not included since it is assumed that most of these students already live in Maryland.⁶ The University of Maryland, Baltimore estimates that student living expenses range from a low of \$20,892 for a School of Law student to a high of \$31,428 for a School of Dentistry student. The number of full-time students in each program was multiplied by each program's estimated living expenses to estimate total student spending. The *Upper Bound* student expenditure estimate, \$106.5 million, includes spending by all University of Maryland, Baltimore full-time students. Student expenditures account for 12% of total *Upper Bound* University-related expenditures. The *Lower Bound* estimate at \$89.4 million, accounting for 12% of the *Lower Bound* expenditures, includes expenditures only for students who would not have attended another Maryland university in the absence of the University of Maryland, Baltimore.

Visitor Expenditures represent expenditures by out-of-state visitors attracted into Maryland by the University of Maryland, Baltimore. The University of Maryland, Baltimore's national and international reputation draws visitors from around the world. There are an estimated total of 197,375 out-of-State visitor days associated with UMB for people to visit students or attend meetings, conferences, or other events at the University. These visitors to the State spent an estimated \$16.9 million on hotels, restaurants, retail purchases, and entertainment in Maryland and account for 2% of total *Upper Bound* University-related expenditures. The *Lower Bound* visitor expenditure estimate is \$14.4 million and accounts for 2% of total *Lower Bound* University-related expenditures.

Construction Expenditures consist of construction and major renovation expenditures made by the University of Maryland, Baltimore, including the construction of the new research park. The University spent \$101.5 million on construction in fiscal 2005. Construction expenditures account for 12% of total *Upper Bound* University-related expenditures. The *Lower Bound* construction expenditure estimate is \$82.5 million, accounting for 11% of total estimated *Lower Bound* University-related expenditures.

University of Maryland, Baltimore Foundation Expenditures consist of expenditures made by the University of Maryland, Baltimore Foundation, Inc. to support the teaching, research, scholarship, and community service activities of the University of Maryland, Baltimore. These expenditures are derived from income generated from gifts and endowments. These expenditures include only direct, in-state spending by the Foundation and exclude transfers to the University of Maryland, Baltimore, which would be included in University operating expenditures. University of Maryland, Baltimore Foundation expenditures represents 1% of both estimated *Upper Bound* and *Lower Bound* expenditures.

⁶ Some part-time students commute into Maryland from out-of-State, and in-state spending by these students could be included in this analysis. However, no estimates of this spending were available. Thus, the overall impact of student expenditures could be larger than is indicated in this report.

Medical Service Plan/University Physicians Incorporated (MSP/UPI) Expenditures consist of in-state spending related to the provision of health care services by School of Medicine faculty. These expenditures account for 10% of total estimated *Upper Bound* expenditures and for 4% of estimated *Lower Bound* expenditures.

Table 3
University of Maryland, Baltimore and Affiliated Institutions
Total In-State Expenditures, by Category
(Millions of Dollars)

Item	Upper Bound Estimate	% of Total	Lower Bound Estimate	% of Total
Total Maryland Expenditures	<u>879.4</u>	<u>100%</u>	<u>743.5</u>	<u>100%</u>
Total Operating Expenditures	553.8	63%	519.5	70%
Student Expenditures	106.5	12%	89.4	12%
Visitor Expenditures	16.9	2%	15.4	2%
Construction Expenditures	101.5	12%	82.5	11%
University of Maryland Foundation	12.9	1%	10.5	1%
MSP/UPI	87.8	10%	26.2	4%

Source: University of Maryland and The Jacob France Institute

Table 4
University of Maryland, Baltimore In-State Expenditures by School

Item	Upper Bound Estimate	% of Total	Lower Bound Estimate	% of Total
Total	<u>879.4</u>	<u>100%</u>	<u>743.5</u>	<u>100%</u>
School of Dentistry	54.2	6%	54.2	7%
School of Law	32.5	4%	28.7	4%
School of Medicine	394.3	45%	394.3	53%
School of Nursing	36.2	4%	20.5	3%
School of Pharmacy	29.7	3%	29.7	4%
School of Social Work	25.4	3%	11.7	2%
Central Administration (1)	206.5	23%	167.8	23%
University of Maryland Foundation	12.9	1%	10.5	1%
MSP/UPI	87.8	10%	26.2	4%

(1) Central Administration includes all expenditures that can not be allocated directly to a School.

Source: University of Maryland and The Jacob France Institute

2.0 The Impact of the University of Maryland, Baltimore on Maryland Economic Output

Expenditures associated with the University of Maryland, Baltimore are circulated within the State’s economy and become income for residents and businesses. As described above, this creates “spin-off” or “multiplier” effects as this money is spent and then re-spent in the State economy. Thus, each dollar of new spending creates more than one dollar in economic impact, as that spending is earned and, in turn, spent by others in the State.

The estimated economic output impact of the University of Maryland, Baltimore by expenditure category is presented in Table 5 and by school in Table 6. Direct impacts are the changes in economic activity directly attributable to the University. Indirect impacts are the “spin-off” or “multiplier” effects caused by the introduction of a new spending stream into the local economy.

Using the *Upper Bound* estimate, total direct University and associated student and visitor expenditures of \$879.4 million are leveraged with an additional \$1.1 billion in indirect spending for a combined total impact of nearly \$2.0 billion. With the *Lower Bound* estimate, total direct University and associated student and visitor expenditures of \$743.5 million are leveraged with an additional \$906.9 million in indirect spending for a combined total impact of nearly \$1.7 billion.⁷

Table 5
Economic Output Impact of
The University of Maryland, Baltimore on the Maryland Economy
By Expenditure Category

Item	Upper Bound			Lower Bound		
	Direct	Indirect	Total Impact	Direct	Indirect	Total Impact
Total Maryland Expenditures	<u>879.4</u>	<u>1,067.8</u>	<u>1,947.3</u>	<u>743.5</u>	<u>906.9</u>	<u>1,650.4</u>
Total Operating Expenditures	553.8	716.8	1,270.6	519.5	672.5	1,192.0
Student Expenditures	106.5	91.8	198.2	89.4	77.1	166.5
Visitor Expenditures	16.9	16.9	33.9	15.4	15.4	30.9
Construction Expenditures	101.5	118.8	220.4	82.5	96.5	179.1
University of Maryland Foundation	12.9	16.7	29.5	10.5	13.5	24.0
MSP/UIP	87.8	106.9	194.7	26.2	31.8	58.0

Source: University of Maryland and The Jacob France Institute

By school, the School of Medicine and the School of Dentistry have the greatest impacts when analyzing both the *Upper Bound* and the *Lower Bound* estimates.

⁷ No multipliers for students or visitors exist in the RIMSII model. In order to estimate the economic impact of this spending, blended multipliers were derived for each category of spending based on average spending by major expenditure category by students (from the U.S. Department of Labor’s *Consumer Expenditure Survey*) and by visitors (from average tourist expenditures data from the Maryland Department of Business and Economic Development).

Table 6
Economic Output Impact of
The University of Maryland, Baltimore on the Maryland Economy
By School

Item	Upper Bound			Lower Bound		
	Direct	Indirect	Total Impact	Direct	Indirect	Total Impact
Total	<u>879.4</u>	<u>1,067.8</u>	<u>1,947.3</u>	<u>743.5</u>	<u>906.9</u>	<u>1,650.4</u>
School of Dentistry	54.2	62.0	116.2	54.2	62.0	116.2
School of Law	32.5	34.5	67.0	28.7	30.5	59.2
School of Medicine	394.3	495.5	889.8	394.3	495.5	889.8
School of Nursing	36.2	38.7	74.9	20.5	21.9	42.5
School of Pharmacy	29.7	32.4	62.1	29.7	32.4	62.1
School of Social Work	25.4	26.7	52.1	11.7	12.3	23.9
University Central Administration (1)	206.5	254.6	461.1	167.8	206.9	374.7
University of Maryland Foundation	12.9	16.7	29.5	10.5	13.5	24.0
MSP/UIP	87.8	106.9	194.7	26.2	31.8	58.0

(1) Central Administration includes all expenditures that can not be allocated directly to a School.

Source: University of Maryland and The Jacob France Institute

3.0 The Impact of the University of Maryland, Baltimore on Maryland Employment and Employee Earnings

The University of Maryland, Baltimore is one of the major employers in both Baltimore City and the State. The University and its affiliated institutions directly employ or support 6,031 workers. However, the employment impact of the University, including the jobs supported by the multiplier effects, is much greater than this employment figure. The employment impacts of the University of Maryland, Baltimore are presented by major expenditure area in Table 7, by school in Table 8 and the wage and salary impacts of the University of Maryland, Baltimore are presented by major expenditure area in Table 9 and by school in Table 10.

Using the *Upper Bound* estimate, the expenditures made by the University, its students, and visitors support an additional 13,396 jobs in Maryland, for a total University employment impact of 19,427. As seen in Table 9, there is a total of just under \$900 million in salaries and wages associated with the jobs at, or supported by, the University of Maryland, Baltimore. Using the *Lower Bound* estimate, the expenditures made by the University, its students, and visitors support an additional 11,782 jobs in Maryland, for a total University employment impact of 16,767 with an associated \$776.5 million in salaries and wages for the jobs at, or supported by, the University of Maryland, Baltimore.

Table 7
Employment Impact of
The University of Maryland, Baltimore on the Maryland Economy
By Expenditure Category
(Number of Jobs)

Item	Upper Bound			Lower Bound		
	Direct	Indirect	Total Impact	Direct	Indirect	Total Impact
Total Maryland Employment	<u>6,031</u>	<u>13,396</u>	<u>19,427</u>	<u>4,985</u>	<u>11,782</u>	<u>16,767</u>
Total Operating Expenditures	5,117	8,264	13,381	4,712	7,841	12,553
Student Expenditures	--	1,929	1,929	--	1,620	1,620
Visitor Expenditures	--	436	436	--	397	397
Construction Expenditures	--	1,650	1,650	--	1,341	1,341
University of Maryland Foundation	--	311	311	--	253	253
MSP/UIP	914	805	1,719	272	331	603

Source: University of Maryland and The Jacob France Institute

Table 8
Employment Impact of
The University of Maryland, Baltimore on the Maryland Economy
By School
(Number of Jobs)

Item	Upper Bound			Lower Bound		
	Direct	Indirect	Total Impact	Direct	Indirect	Total Impact
Total	<u>6,031</u>	<u>13,396</u>	<u>19,427</u>	<u>4,985</u>	<u>11,782</u>	<u>16,767</u>
School of Dentistry	323	879	1,202	323	879	1,202
School of Law	169	518	687	149	458	608
School of Medicine	2,949	6,431	9,380	2,949	6,431	9,380
School of Nursing	282	487	769	160	276	436
School of Pharmacy	261	378	639	261	378	639
School of Social Work	144	390	534	66	179	245
University Central Administration (1)	989	3,196	4,185	804	2,598	3,401
University of Maryland Foundation		311	311		253	253
MSP/UIP	914	805	1719	272	331	603

(1) Central Administration includes all expenditures that can not be allocated directly to a School.

Source: University of Maryland and The Jacob France Center

Table 9
Earnings Impact of
The University of Maryland, Baltimore on the Maryland Economy
By Expenditure Category
(Millions of Dollars)

Item	Upper Bound			Lower Bound		
	Direct	Indirect	Total Impact	Direct	Indirect	Total Impact
Total Maryland Earnings	<u>447.5</u>	<u>452.4</u>	<u>899.8</u>	<u>398.5</u>	<u>378.0</u>	<u>776.5</u>
Total Operating Expenditures	408.4	283.9	692.3	386.8	268.5	655.3
Student Expenditures	--	51.3	51.3	--	29.8	29.8
Visitor Expenditures	--	10.1	10.1	--	9.2	9.2
Construction Expenditures	--	66.6	66.6	--	54.1	54.1
University of Maryland Foundation	--	10.0	10.0	--	8.2	8.2
MSP/UIP	39.1	30.4	69.5	11.7	8.2	19.9

Source: University of Maryland and The Jacob France Institute

Table 10
Earnings Impact of
The University of Maryland, Baltimore on the Maryland Economy
By School
(Millions of Dollars)

Item	Upper Bound			Lower Bound		
	Direct	Indirect	Total Impact	Direct	Indirect	Total Impact
Total	<u>447.5</u>	<u>452.4</u>	<u>899.8</u>	<u>398.5</u>	<u>378.0</u>	<u>776.5</u>
School of Dentistry	23.2	25.3	48.5	23.2	25.3	48.5
School of Law	12.1	17.2	29.3	10.6	15.1	25.7
School of Medicine	289.9	218.7	508.6	289.9	205.6	495.5
School of Nursing	14.7	19.7	34.4	8.3	11.1	19.4
School of Pharmacy	13.0	15.9	28.9	13.0	15.9	28.9
School of Social Work	8.9	13.4	22.3	3.9	6.0	9.9
University Central Administration (1)	46.6	101.9	148.5	37.8	82.8	120.6
University of Maryland Foundation	--	10.0	10.0	--	8.2	8.2
MSP/UIP	39.1	30.4	69.5	11.7	8.2	19.9

(1) Central Administration includes all expenditures that can not be allocated directly to a School.

Source: University of Maryland and The Jacob France Institute

4.0 The Fiscal Impact of the University of Maryland, Baltimore

The University of Maryland, Baltimore also has an impact on fiscal conditions in the State of Maryland. The salaries earned by University employees and the jobs created and sustained through University spending are subject to State and local income taxes. Many of the purchases made by University employees or the persons directly or indirectly supported by the University are also subject to sales tax. The *Upper Bound* estimate of the income and sales tax impact of the University and its related economic impacts on the State is \$32.0 million, with \$18.6 million in income taxes and \$13.5 million in sales taxes. The *Upper Bound* estimate of local income tax revenues for the University is \$11.5 million. The *Lower Bound* estimate of the State income and sales tax impact of the University and its related economic impacts is \$27.6 million, with \$16.0 million in income taxes and \$11.6 million in sales taxes. The *Lower Bound* estimate of local income tax revenues for the University is nearly \$10.0 million.

Table 11
Fiscal Impact of
The University of Maryland, Baltimore on the State of Maryland
(Millions of Dollars)

Item	Upper Bound			Lower Bound		
	Direct	Indirect	Total Impact	Direct	Indirect	Total Impact
Total State Government Revenues	<u>15.9</u>	<u>16.1</u>	<u>32.0</u>	<u>14.2</u>	<u>13.5</u>	<u>27.6</u>
State Income Tax (1)	9.2	9.3	18.6	8.2	7.8	16.0
Retail Sales Tax (2)	6.7	6.8	13.5	6.0	5.7	11.6
Estimated Local Income Tax Revenues (1)	5.7	5.8	11.5	5.1	4.8	9.9

(1) Calculated as the incremental increase in earnings multiplied by the effective state or local income tax rate.

(2) An average of 29.9% of income is spent on goods subject to sales taxes calculated using Maryland's 5% sales tax rate.

Source: University of Maryland and The Jacob France Institute

The fiscal impact of the University of Maryland, Baltimore can also be analyzed in terms of the level of economic output leveraged by the State appropriation. Universities, unlike other State government activities, attract a substantial portion of their revenues from other sources. In fiscal 2005, State appropriations of \$133.5 million only accounted for 20% of University funding, down from 23% in FY2004. This leveraging of State appropriations, combined with the economic impacts discussed above, leads to a high return on State expenditures. Dividing the total economic output impacts of the University by the State appropriation provides an estimate of the economic returns on the State's investment in the University of Maryland, Baltimore. For the *Upper Bound* impact estimate, the University of Maryland, Baltimore generates \$14.59 in economic output for each \$1 appropriated. Using the *Lower Bound* impact estimate, the University of Maryland, Baltimore generates \$12.36 in economic output for each \$1 appropriated.

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