



1-2017

THE ECONOMIC IMPACT OF MURRAY STATE UNIVERSITY ON KENTUCKY, WEST KENTUCKY AND CALLOWAY COUNTY

Gilbert L. Mathis Ph.D.
Murray State University

Follow this and additional works at: <https://digitalcommons.murraystate.edu/reports>

Recommended Citation

Mathis, Gilbert L. Ph.D., "THE ECONOMIC IMPACT OF MURRAY STATE UNIVERSITY ON KENTUCKY, WEST KENTUCKY AND CALLOWAY COUNTY" (2017). *Reports*. 1.
<https://digitalcommons.murraystate.edu/reports/1>

This Article is brought to you for free and open access by the University Publications at Murray State's Digital Commons. It has been accepted for inclusion in Reports by an authorized administrator of Murray State's Digital Commons. For more information, please contact msu.digitalcommons@murraystate.edu.

THE ECONOMIC IMPACT OF MURRAY STATE UNIVERSITY
ON
KENTUCKY, WEST KENTUCKY AND CALLOWAY COUNTY

By

Gilbert L. Mathis
Professor of Economics
Murray State University

January 2017

ACKNOWLEDGEMENTS

Many people contributed to this study. Included were members of the administration, faculty, staff and student body at Murray State University, leaders in business and government in Kentucky and Calloway County and resource persons throughout the county. Although too numerous to mention individually their contribution was invaluable and most appreciated.

Special thanks are extended to Dr. Robert Davies, President, Murray State University for his leadership in promoting the study in the University community and enlisting faculty, staff and student participation and to Dr. Tim Todd, Dean, Arthur J. Bauernfeind College of Business and Interim Provost and Academic Vice President for providing resources to conduct the study and for his council during the project. Special thanks are also extended to Jackie Dudley, Vice President and Chief Financial Officer for her help in obtaining financial data and in conducting the administration, faculty and staff surveys and to Dr. Don Robertson, Vice President of Student Affairs for his help in conducting the visitor surveys. Personal thanks are also extended to Dr. Renae Duncan, Acting Provost and Academic-Vice President and Dr. Adrienne King, Vice President for Marketing and Outreach for support given in their administrative areas.

The writer is also indebted to Sharon Melone, Executive Coordinator, Finance, Ellen Dale, Director of Accounting and Financial Services, Stephanie Jennings, Assistant Director, General Accounting, Jason Royalty, Assistant Director of Reporting, and Dr. Robert Jackson, President, Murray State Foundation for analyzing University financial records and estimating University expenditures at the state, regional and local levels and Jennifer Smith, Coordinator of Student Services,

Office of Enrollment Management, Joyce Gordon, Director, Human Resources, Tracy Roberts, Registrar and Misty Williams, Director, Alumni Affairs for analyzing and providing data with respect to student, faculty and alumni demographics.

Special thanks are extended to Dr. Andrew Batts, Professor Emeritus, Department of Computer Science and Information Systems and Savannah Allen, Graduate Student, Department of Economics and Finance for their contributions to the Study. Dr. Batts assisted in development of the employee and student questionnaires, generated the random sample for conducting the student surveys, performed the statistical analysis of the data and provided counsel in many of the judgmental calls involving the data. Savannah Allen assisted with many phases of the study including helping revise the questionnaires, researching statistical data, contacting some of the resource persons, entering data for statistical analysis and typing the manuscript. Special thanks are also extended to Miranda Bevins and Daniel Mathis for helping conduct the Student Surveys and to Kelli Hicks for researching and compiling some of the demographic data.

Finally, the writer extends his thanks to Murray State administrators, faculty, staff and students who completed the questionnaires and to the resource people cited throughout the study.

Gilbert L. Mathis, Ph.D.
Professor Emeritus, Economics,
Murray State University

OVERVIEW

Murray State University has a substantial impact on Kentucky, West Kentucky, and Calloway County. The impact is both economic and noneconomic. The economic impact includes both direct and indirect costs and benefits.

The cost of Murray State to the residents of Kentucky was estimated at \$132,206,175. This included direct costs of \$48,025,100 appropriated from the state and \$84,051,198 for state government services. The indirect cost included \$129,877 of revenue lost from tax-exempted, University-owned property.

The cost of Murray State to the residents of West Kentucky was estimated at \$10,678,782. This included direct cost of \$6,985,314 for local government services and \$3,575,458 for educating University-related students. The indirect cost included \$118,010 of revenue lost from tax-exempted, University-owned property.

The cost of Murray State to the residents of Calloway County was estimated at \$8,368,576. This included direct costs of \$5,972,916 for local government services and \$2,301,695 for educating University-related students. The indirect cost included \$93,965 of revenue lost from tax-exempted, University-owned property.

The direct benefit of Murray State to the economy of Kentucky was estimated at \$260,826,674. This included \$35,482,086 received from direct University expenditures, \$56,585,455 received from expenditures from faculty and staff, \$144,288,630 received through expenditures of University students, \$6,300,989 spent by visitors from outside the state to University functions and personnel and \$18,169,514 paid in taxes by Murray State and property and state income taxes paid by University-related personnel.

The total benefit of Murray State-related expenditures to Kentucky's economy was estimated at \$495,059,030. This included the \$260,826,674 which was directly injected into the Kentucky economy by University-related expenditures, plus the multiplier effect of those dollars as they were re-spent in the state.

The additional employment in Kentucky resulting from Murray State was estimated at 6,025 full-time jobs. Approximately 1,385 Kentucky residents (not including student workers) were employed full time directly by Murray State and approximately 4,640 full-time jobs resulted from indirect business activity in Kentucky.

The expansion in the credit base of Kentucky banks and financial institutions resulting from deposits of Murray State and related personnel was estimated at \$66,429,438 annually. This estimation was based on direct deposits of the University and related personnel of approximately \$83,036,797.

The direct benefit of Murray State to the economy of West Kentucky was estimated at \$203,864,850. This included \$30,441,217 received from direct University expenditures, \$46,263,769 received from expenditures of faculty and staff, \$113,726,748 received through expenditures of University students, \$7,744,096 spent by visitors from outside West Kentucky to University functions and personnel and \$5,689,020 paid in taxes to regional local governments by Murray State and University-related personnel.

The total benefit of Murray State-related expenditures to West Kentucky's economy was estimated at \$306,046,384. This included the \$203,864,850 which was directly injected into the West Kentucky economy by University-related expenditures plus the multiplier effect of those dollars as they were re-spent in the region.

The additional employment in West Kentucky resulting from Murray State was estimated at 3,812 full-time jobs. Approximately 1,385 West Kentucky residents (not including student workers) were employed full-time directly by Murray State and approximately 2,427 full-time jobs resulted from induced business activity in West Kentucky.

The expansion in the credit base of West Kentucky banks and financial institutions resulting from deposits of Murray State and related personnel was estimated at \$56,360,622 annually. This estimation was based on direct deposits of the University and related personnel of approximately \$70,450,828.

The direct benefit of Murray State to the economy of Calloway County was estimated at \$158,805,264. This included \$14,846,541 received from University expenditures, \$40,279,294 received from expenditures of faculty and staff, \$86,142,006 received through expenditures of University students, \$13,204,938 spent by visitors from outside the county to University functions and personnel, and \$4,332,485 paid in taxes by Murray State and University-related personnel to local governments.

The total benefit of Murray State-related expenditures to Calloway County's economy was estimated at \$209,809,021. This included the \$158,805,264 which was directly injected into the Calloway County's economy by University-related expenditures plus the multiplier effect of those dollars as they were re-spent in the county.

The additional employment in Calloway County resulting from Murray State was estimated at 2,890 full-time jobs. Approximately 1,111 Calloway County residents (not including student workers) were employed full-time directly by Murray

State and approximately 1,779 full-time jobs resulted from induced business activity in Calloway County.

The expansion in the credit base of Calloway County banks and financial institutions resulting from deposits of Murray State and related personnel was estimated at \$51,098,932 annually. This estimation was based on direct deposits of the University and related personnel of approximately \$63,873,665.

While it was beyond the scope of this study to estimate the long-run impact of Murray State University on the general economic and social infrastructure of Kentucky, West Kentucky, and Calloway County, data were generated which suggest a relationship between the availability of higher education, educational attainment, and the levels of employment and income.

The potential contribution to human capital, based on the number of Murray State graduates in Kentucky, and the differential between earnings of college graduates and high school graduates is estimated at \$921,323,085. The potential contribution to human capital in West Kentucky is estimated at \$657,919,984, and the potential contribution to human capital in Calloway County is estimated at \$138,746,998, annually.

Murray State contributes to the overall quality of life in the region by providing recreational facilities, entertainment activities including sports, theater, and concerts and enhances cultural development through lectures, exhibits, and events held at the Hancock Biological Station, Cherry Agricultural Exposition Center, Pullen Farm and the Community Financial Services Bank (CFSB) Center.

Table of Contents

Acknowledgements	ii
Overview	iv
List of Tables	xii

Chapter

I. Introduction	1
Purpose.....	2
General Economic Infrastructure	3
Methodology and Data	7
Limitations.....	9
II. Cost of Murray State University.....	12
Cost to Kentucky	12
Direct Appropriation to Murray State	13
Cost of Government Provided Services.....	13
Lost Property Tax Revenue	15
Revenue Loss from Land and Improvements.....	16
Revenue Loss from Land	18
Cost to West Kentucky	20
Cost of Government Provided Services.....	20
Cost to Regional School Systems for Educating University-Related Children.....	23
Lost Property Tax Revenue	24
Revenue Loss from Land and Improvements.....	24
Revenue Loss from Land	26

Table of Contents
(Continued—)

Cost to Murray and Calloway County	29
Cost of Government Provided Services	30
Cost to Local School Systems for Educating University-Related Children.....	33
Lost Property Tax Revenue	34
Revenue Loss from Land and Improvements	35
Revenue Loss from Land	37
Cost of University Competition with Local Businesses	37

Chapter

III.	Direct Benefits of Murray State University.....	39
	Benefits to Kentucky	39
	Murray State Purchases	41
	Budget Expenditures.....	41
	Foundation Expenditures	42
	University Alumni Association Expenditures	42
	Capital Construction	42
	Purchases by University Employees	46
	Purchases by University Students	
	Purchases by Visitors	52
	Taxes Paid by Murray State and Related Personnel	53
	Benefits to West Kentucky.....	60
	Murray State Purchases	61
	Budget Expenditures.....	62
	Foundation Expenditures	62
	University Alumni Association Expenditures	62
	Capital Construction	66
	Purchases by University Employees	67
	Purchases by University Students	69
	Purchases by Visitors	74
	Taxes Paid by Murray State and Related Personnel	77

Table of Contents
(Continued—)

Benefits to Murray and Calloway County.....	81
Murray State Purchases	82
Budget Expenditures.....	83
Foundation Expenditures	83
University Alumni Association Expenditures	87
Capital Construction	87
Purchases by University Employees	88
Purchases by University Students	91
Purchases by Visitors	95
Taxes Paid by Murray State and Related Personnel	99

Chapter

IV. Economic Impact of Murray State University.....	102
The Multiplier Concept.....	102
Impact of Murray State University on Kentucky	105
Jobs Attributable to Murray State	106
Impact on Kentucky's Credit Base.....	107
Impact of Murray State University on West Kentucky.....	109
Jobs Attributable to Murray State	110
Impact on West Kentucky's Credit Base	111
Impact of Murray State University on Calloway County.....	113
Jobs Attributable to Murray State	114
Impact on Calloway County's Credit Base	115

Table of Contents
(Continued—)

Chapter

V.	Impact of Murray State University on the State and Regional Economic and Social Infrastructure	118
	Impact on Human Capital	118
	Impact on Economic Development.....	122
	Impact on Technology.....	123
	Impact on Social Diversity	124
	Impact on Quality of Life	126
	Appendix A: Faculty and Staff Survey.....	129
	Appendix B: Student Survey.....	135
	Appendix C: Resource Persons	142
	Bibliography	146

List of Tables

1. ENROLLMENT AT MURRAY STATE UNIVERSITY DURING THE 2015-2016 ACADEMIC YEAR..... 4

2. COST OF MURRAY STATE UNIVERSITY TO KENTUCKY 13

3. COST TO STATE GOVERNMENT FOR SERVICES PROVIDED THE UNIVERISTY COMMUNITY..... 15

4. MURRAY STATE UNIVERSITY-OWNED TAX-EXEMPTED REAL PROPERTY IN KENTUCKY 17

5. KENTUCKY PROPERTY TAX FORGONE FROM LAND AND BUILDINGS OWNED BY MURRAY STATE UNIVERSITY..... 17

6. KENTUCKY PROPERTY TAX FORGONE FROM LAND OWNED BY MURRAY STATE UNIVERSITY 19

7. COST OF MURRAY STATE UNIVERSITY TO WEST KENTUCKY..... 21

8. COST TO LOCAL GOVERNMENT FOR SERVICES PROVIDED THE UNIVERSITY COMMUNITY 22

9. COST TO REGIONAL SCHOOL SYSTEMS FOR EDUCATING UNIVERSITY-RELATED CHILDREN 24

10. MURRAY STATE UNIVERSITY-OWNED, TAX-EXEMPTED REAL PROPERTY IN WEST KENTUCKY 26

11. REGIONAL PROPERTY TAX FORGONE FROM LAND AND BUILDINGS OWNED BY MURRAY STATE UNIVERSITY 27

12. REGIONAL PROPERTY TAX FORGONE FROM LAND OWNED BY MURRAY STATE UNIVERSITY 28

13. COST MURRAY STATE UNIVERSITY TO MURRAY AND CALLOWAY COUNTY 30

14. COST OF LOCAL GOVERNMENT SERVICES PROVIDED THE UNIVERSITY COMMUNITY 32

15. COST TO LOCAL SCHOOL SYSTEMS FOR EDUCATING UNIVERISTY-RELATED CHILDREN 35

16. LOCAL PROPERTY TAX FORGONE FROM LAND AND BUILDINGS OWNED BY MURRAY STATE UNIVERSITY..... 36

17. LOCAL PROPERTY TAX FORGONE FROM LAND OWNED BY MURRAY STATE UNIVERSITY 38

List of Tables
(continued—)

18. ESTIMATED EXPENDITURES IN KENTUCKY FOR FISCAL YEAR 2015-2016 BY THE UNIVERSITY COMMUNITY	40
19. ESTIMATED UNIVERSITY BUDGET EXPENDITURES FOR GOODS AND SERVICES PURCHASED DURING FISCAL YEAR 2014-2015	43
20. ESTIMATED UNIVERSITY FOUNDATION EXPENDITURES FOR GOODS AND SERVICES PURCHASED DURING FISCAL YEAR 2014-2015	44
21. ESTIMATED UNIVERSITY ALUMNI ASSOCIATION EXPENDITURES FOR GOODS AND SERVICES PURCHASED DURING FISCAL YEAR 2014-2015	45
22. EXPENDITURES FOR CAPITAL CONSTRUCTION PROJECTS	45
23. ESTIMATED EXPENDITURES OF UNIVERSITY ADMINISTRATORS IN KENTUCKY DURING FISCAL YEAR 2014-2015.....	48
24. ESTIMATED EXPENDITURES OF UNIVERSITY FACULTY IN KENTUCKY DURING FISCAL YEAR 2014-2015	49
25. ESTIMATED EXPENDITURES OF UNIVERSITY STAFF IN KENTUCKY DURING FISCAL YEAR 2014-2015	50
26. ESTIMATED EXPENDITURES OF UNIVERSITY STUDENTS IN KENTUCKY DURING FISCAL YEAR 2014-2015	51
27. ESTIMATED EXPENDITURES BY PERSONS OUTSIDE KENTUCKY VISITING UNIVERSITY FUNCTIONS	54
28. ESTIMATED EXPENDITURES BY PERSONS OUTSIDE KENTUCKY VISITING UNIVERSITY PERSONNEL	56
29. REVENUE PAID TO THE COMMONWEALTH OF KENTUCKY BY MURRAY STATE UNIVERSITY 2014-2015	57
30. ESTIMATED STATE INCOME TAX PAID BY UNIVERSITY-RELATED PERSONNEL	58
31. REVENUE PAID TO LOCAL GOVERNMENTS IN KENTUCKY BY UNIVERSITY-RELATED PERSONNEL.....	59
32. ESTIMATED EXPENDITURES IN WEST KENTUCKY FOR FISCAL YEAR 2015-2016 BY THE UNIVERSITY COMMUNITY	61

List of Tables
(continued—)

33. ESTIMATED UNIVERSITY BUDGET EXPENDITURES FOR GOODS AND SERVICES PURCHASED DURING FISCAL YEAR 2014-2015	64
34. ESTIMATED UNIVERSITY FOUNDATION EXPENDITURES FOR GOODS AND SERVICES PURCHASED DURING FISCAL YEAR 2014-2015	65
35. ESTIMATED UNIVERSITY ALUMNI ASSOCIATION EXPENDITURES FOR GOODS AND SERVICES PURCHASED DURING FISCAL YEAR 2014-2015	66
36. EXPENDITURES FOR CAPITAL CONSTRUCTION PROJECTS.....	67
37. ESTIMATED EXPENDITURES OF UNIVERSITY ADMINISTRATORS IN WEST KENTUCKY DURING FISCAL YEAR 2014-2015	70
38. ESTIMATED EXPENDITURES OF UNIVERSITY FACULTY IN WEST KENTUCKY DURING FISCAL YEAR 2014-2015.....	71
39. ESTIMATED EXPENDITURES OF UNIVERSITY STAFF IN WEST KENTUCKY DURING FISCAL YEAR 2014-2015.....	72
40. ESTIMATED EXPENDITURES OF UNIVERSITY STUDENTS IN WEST KENTUCKY DURING FISCAL YEAR 2014-2015.....	73
41. ESTIMATED EXPENDITURES BY PERSONS OUTSIDE WEST KENTUCKY VISITING UNIVERSITY FUNCTIONS	76
42. ESTIMATED EXPENDITURES BY PERSONS OUTSIDE WEST KENTUCKY VISITING UNIVERSITY PERSONNEL	77
43. REVENUE PAID TO LOCAL GOVERNMENTS IN WEST KENTUCKY BY MURRAY STATE UNIVERSITY 2014-2015.....	79
44. REVENUE PAID TO LOCAL GOVERNMENTS IN WEST KENTUCKY BY UNIVERSITY-RELATED PERSONNEL.....	80
45. ESTIMATED LOCAL EXPENDITURES FOR FISCAL YEAR 2015-2016 BY THE UNIVERSITY COMMUNITY	82
46. ESTIMATED UNIVERSITY BUDGET EXPENDITURES FOR GOODS 2014-2015	85
47. ESTIMATED UNIVERSITY FOUNDATION EXPENDITURES FOR GOODS AND SERVICES PURCHASED DURING FISCAL YEAR 2014-2015	86

List of Tables
(CONTINUED—)

48. ESTIMATED UNIVERSITY ALUMNI ASSOCIATION EXPENDITURES FOR GOODS AND SERVICES PURCHASED DURING FISCAL YEAR 2014-2015	87
49. EXPENDITURES FOR CAPITAL CONSTRUCTION PROJECTS.....	88
50. ESTIMATED EXPENDITURES OF UNIVERSITY ADMINISTRATORS IN CALLOWAY COUNTY DURING FISCAL YEAR 2014-2015	90
51. ESTIMATED EXPENDITURES OF UNIVERSITY FACULTY IN CALLOWAY COUNTY DURING FISCAL YEAR 2014-2015.....	92
52. ESTIMATED EXPENDITURES FO UNIVERSITY STAFF IN CALLOWAY COUNTY DURING FISCAL YEAR 2014-2015.....	93
53. ESTIMATED EXPENDITURES OF UNIVERSITY STUDENTS IN CALLOWAY COUNTY DURING FISCAL YEAR 2014-2015.....	94
54. ESTIMATED EXPENDITURES BY PERSONS OUTSIDE CALLOWAY COUNTY VISITING UNIVERSITY FUNCTIONS.....	97
55. ESTIMATED EXPENDITURES BY PERSONS OUTSIDE CALLOWAY COUNTY VISITING UNIVERSITY PERSONNEL.....	98
56. REVENUE PAID TO LOCAL GOVERNMENTS IN CALLOWAY COUNTY BY MURRAY STATE UNIVERSITY 2014-2015	100
57. REVENUE PAID TO LOCAL GOVERNMENTS IN CALLOWAY COUNTY BY UNIVERSITY-RELATED PERSONNEL	101
58. IMPACT OF SPENDING GENERATED BY MURRAY STATE UNIVERSITY ON KENTUCKY.....	106
59. ESTIMATED CHECKABLE AND SAVINGS DEPOSITS OF MURRAY STATE, ITS EMPLOYEES AND STUDENTS HELD IN KENTUCKY BANKS AND FINANCIAL INSTITUTIONS.....	108
60. IMPACT OF SPENDING GENERATED BY MURRAY STATE UNIVERSITY ON WEST KENTUCKY.....	110
61. ESTIMATED CHECKABLE AND SAVINGS DEPOSITS OF MURRAY STATE, ITS EMPLOYEES AND STUDENTS HELD IN WEST KENTUCKY BANKS AND FINANCIAL INSTITUTIONS	112
62. IMPACT OF SPENDING GENERATED BY MURRAY STATE UNIVERSITY ON CALLOWAY COUNTY	114

List of Tables
(CONTINUED—)

63. ESTIMATED CHECKABLE AND SAVINGS DEPOSITS OF MURRAY STATE, ITS EMPLOYEES AND STUDENTS HELD IN CALLOWAY COUNTY BANKS AND FINANCIAL INSTITUTIONS	116
64. PERCENT OF POPULATION 25 YEARS AND OLDER WITH BACHELOR’S DEGREE OR HIGHER DURING 2013	119
65. 2010 MEDIAN FAMILY INCOME	120
66. UNEMPLOYMENT RATE DURING 2015	123

CHAPTER I

INTRODUCTION

It has long been recognized that educational institutions such as Murray State University have a substantial impact on the state, region and community in which they are located. The impact is both economic and noneconomic. There are both costs and benefits that are both direct and indirect. The magnitude of the costs and benefits depend upon a number of factors including the size of the university, the population of the area and the general social and economic infrastructure of the region.

The major direct costs include additional outlays for local government services and the cost to state and local governments of educating the children of university employees and students in the public schools. The major indirect costs include the loss of state and local property tax revenue from university tax-exempted property and sales lost by the private sector to university-operated business activity.

The major direct benefits include expenditures by the university (excluding salaries) expenditures by university employees and student households, and expenditures by people from outside the area visiting university functions and university personnel. Taxes paid by the university and university-related personnel also directly benefit the state, regional and local economies. The major indirect benefits include the “multiplier effect” of dollars directly injected into the state, regional and local economies because of the university-related expenditures, creation of new jobs to provide goods and services to the university community, and expansion of the state, regional, and local credit bases resulting from deposits in financial institutions by the university and university personnel.

Purpose

The purpose of this study was to estimate the impact of Murray State University on the economies of Kentucky, West Kentucky, and Murray/Calloway County. Both costs and benefits of the University to the state regional and local economies were included.

Specifically, the study was designed to estimate the (1) cost of state, regional, and local government services provided to the University community; (2) cost of educating University-related children in the public schools; (3) lost property tax revenue to the state, regional, and local economies resulting from the tax exemption of University property, (4) benefits of state, regional, and local expenditures by the University, its employees, students, and visitors from outside the respective areas to the University and University-related personnel; (5) tax revenue paid by the University, its employees, and students; (6) jobs created to provide goods and services to the University community; and (7) the expansion in the state, regional, and local credit bases resulting from University- related deposits.

Although the focus of this study was the economic costs and benefits of Murray State University on Kentucky, West Kentucky, and Murray/Calloway County, attention was also given to major noneconomic impacts of the University.

Estimates of the cost and benefits of Murray State to the economy of Kentucky, West Kentucky, and Murray/Calloway County should prove useful to University officials, business leaders and public officials by providing insights into the structure of the state, regional and local economies and identifying linkages between the University and the area it services.

General Economic Infrastructure

Murray State University is a comprehensive, coeducational institution, which offers a variety of undergraduate and graduate programs through four colleges and the School of Agriculture and School of Nursing. During the 2014-2015 Fiscal Year, Murray State's operating budget was \$131,433,032 of which \$48,025,100 was contributed by the Commonwealth of Kentucky.¹ Furthermore, during the 2015-2016 Fiscal Year, Murray State had 1,459 employees classified as: 57 administrative and managerial; 363 professional, non-faculty; 488 faculty; and 551 as hourly staff. Staff personnel consisted of 284 office, clerical, and sales workers; 58 technical and paraprofessional workers; 57 skilled crafts workers; and 197 services/maintenance workers.² There were 10,998 students enrolled at Murray State during the 2015 Fall Semester and 9,754 students enrolled during the 2016 Spring Semester.³ Enrollment data for the 2015-2016 academic year is shown in Table 1.

Although Murray State is international in scope, its primary contiguous service area is West Kentucky, West Tennessee, Southeast Missouri, Southern Illinois, and Southwestern Indiana. The primary contiguous service area in Kentucky is the area west of a line from Henderson to Hopkinsville and includes the counties of Ballard, Carlisle, Hickman, Fulton, McCracken, Graves, Marshall, Calloway, Livingston, Crittenden, Lyon, Trigg, Henderson, Union, Webster, Hopkins, Caldwell,

¹ Ed Ross, Controller, Kentucky Finance Cabinet, Frankfort, Kentucky and Ellen Dale, Director of Accounting and Financial Services, Murray State University, Murray, Kentucky.

² Sharon A. Melone, Executive Coordinator, Finance and Administrative Services, Joyce Gordon, Director of Human Resources, and Haley Stedelin, Employment Supervisor, Murray State University, Murray Kentucky.

³ Jennifer W. Smith, Coordinator of Student Services, Office of Enrollment Management, Murray State University, Murray, Kentucky.

TABLE 1
 ENROLLMENT AT MURRAY STATE UNIVERSITY
 DURING THE 2015-2016 ACADEMIC YEAR

<u>Fall 2015</u>		
<u>Residence</u>		<u>Enrollment</u>
Calloway County	1,427	
West Kentucky		5,307
Kentucky		7,430
Out-of-State		2,793
International		775
TOTAL		10,998
<u>Spring 2016</u>		
<u>Residence</u>		<u>Enrollment</u>
Calloway County	1,358	
West Kentucky		4,770
Kentucky		6,519
Out-of-State		2,501
International		734
TOTAL		9,754

SOURCE: Jennifer W. Smith, Enrollment Management and Tracy L. Roberts, University Registrar, Murray State University, Murray Kentucky.

and Christian.⁴ A map showing the Kentucky portion of the primary service area of Murray State University is shown in Figure 1.

Kentucky had a total population of 4,425,092 during 2015.⁵ The primary sources of income and the respective percentages of the total contributed by each

⁴ During the 2015 Fall semester, 5,301, or about 48 percent, of the total resident enrollment were from 18 counties in West Kentucky and 2,447, or about 88 percent, of the total U.S. nonresident enrollment were from Tennessee, Illinois, Missouri, and Indiana.

⁵ U.S. Department of Commerce, Bureau of the Census, Population Division, Washington, D.C.

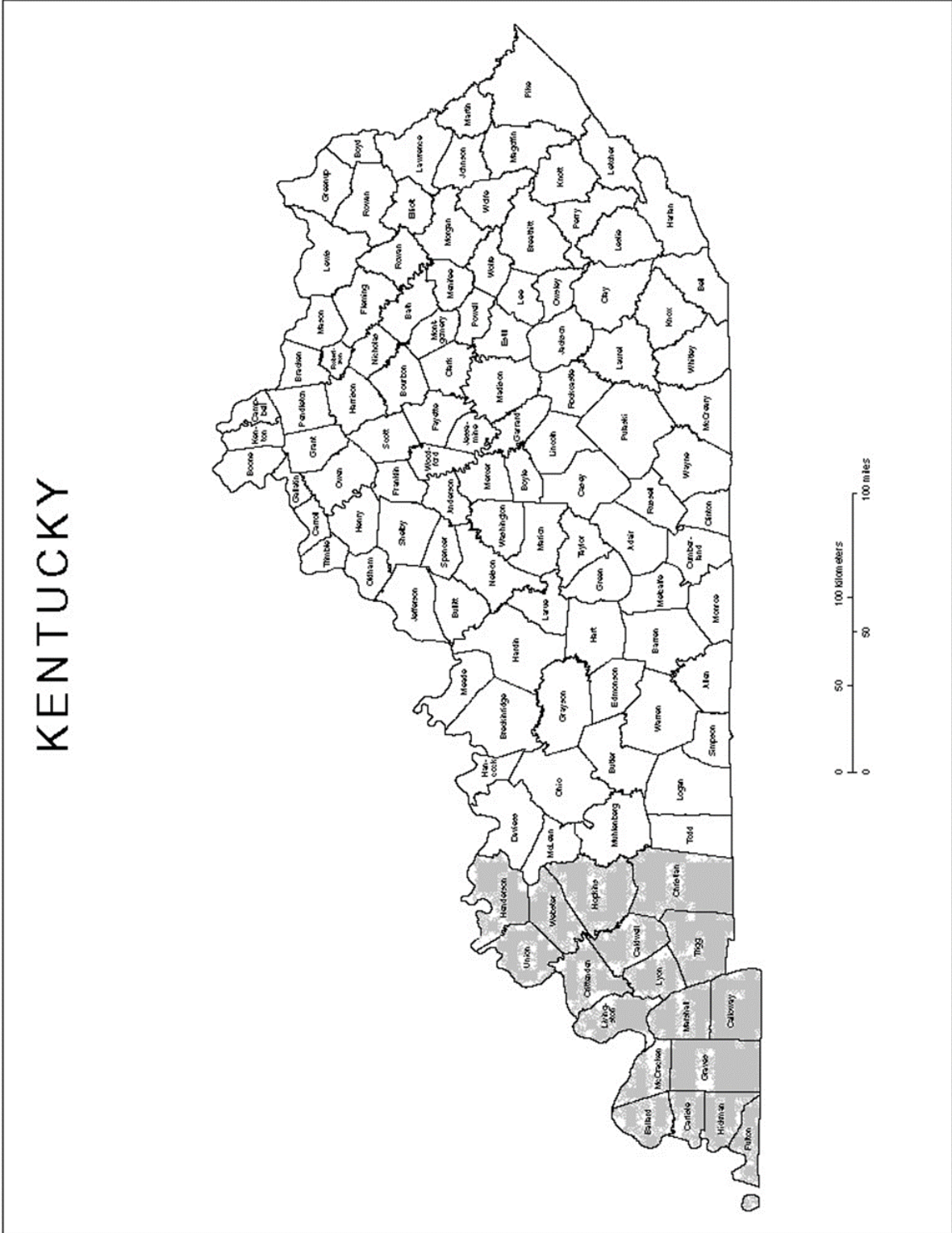


Figure 1 Primary Service Area of Murray State University

source were: farm, 1.4 percent; mining, .5 percent; construction, 5.0 percent; manufacturing, 17.6 percent; utilities, trade, and transportation, 19.3 percent; information, 1.7 percent; finance, insurance, and real estate, 7.1 percent; services, 33.2 percent; and government, 14.2 percent.⁶

The eighteen Kentucky counties which comprise Murray State University's primary contiguous service area had a total population of 443,696 during 2015.⁷ The primary sources of income in the eighteen county region and the respective percentages of the total contributed by each source were: farm, 1.0 percent; mining, 4.6 percent; construction, 6.1 percent; manufacturing, 20.5 percent; utilities, trade, and transportation, 19.9 percent; information, 1.4 percent; finance, insurance, and real estate, 3.7 percent; services 28.7 percent; and government, 14.1 percent.⁸

Murray, the county seat of Calloway County, had an estimated population of 18,954 during 2015. The population of Calloway County was estimated at 38,343 during 2015.⁹ The primary sources of income in Calloway County and the respective percentages of the total contributed by each source were: farm, .6 percent; construction, 4.0 percent; manufacturing, 21.1 percent; utilities, trade, and transportation, 21.5 percent; mining, 0.0 percent; information, 1.5 percent; finance, insurance, and real estate, 3.2 percent; services 15.5 percent; and government, 32.6 percent.¹⁰

Methodology and Data

⁶ Commonwealth of Kentucky, Workforce Development Cabinet, and Kentucky Career Center, Frankfort, Kentucky.

⁷ U.S. Department of Commerce, op cit.

⁸ Commonwealth of Kentucky, op cit.

⁹ U.S Department of Commerce, op cit.

¹⁰ Commonwealth of Kentucky, op cit.

The study was conducted as an economic impact study measuring both costs and benefits. The procedure followed was similar to that recommended by Caffrey and Isaacs of the American Council on Education, ¹¹ and the findings were consistent with those of an earlier study conducted at Murray State¹² and similar studies at other universities which are cited in the Bibliography.

Data used in the study were obtained from various sources. Estimates of the cost of Murray State University to the state, regional, and local economies were based on data from a number of public documents; information obtained through interviews with public officials at the state, regional, and local levels; and through questionnaires administered to University employees and students. These data along with the specific sources are cited in Chapter II.

Expenditures by Murray State University were estimated by analyzing the budget and purchasing records to identify the goods and services bought in Kentucky, West Kentucky and Murray/Calloway County. These estimates were made by the Director of Accounting and Financial Services, Assistant Director of General Accounting, Grants Accountant, President of University Foundation and Assistant Director for Reporting. University construction expenditures were estimated by the Director of Accounting and Financial Services through an analysis of annual reports over a six-year period. These data, along with the specific sources, are cited in Chapter III.

Estimates of state, regional, and local expenditures of Murray State administrators, faculty, and staff were obtained through a questionnaire

¹¹ John Caffrey and Herbert H. Isaacs, Estimating the Impact of a College or University on the Local Economy, American Council on Education, Washington, D.C., 1971.

¹² Gilbert L. Mathis, "The Economic Impact of Murray State University on Kentucky, West Kentucky, and Calloway County," Murray, Kentucky, October 2003.

administered to University employees. The questionnaire was designed to exclude payments by University employees to Murray State University or to recipients outside Kentucky. The study was completed by 53 administrators making up 13 percent of the total administrators, 50 faculty making up 10 percent of the total faculty, and 29 University staff making up 5 percent of the total University staff. A copy of the questionnaire used to obtain the data from University employees is shown in appendix A.

Estimates of the state, regional, and local expenditures of Murray State students were based on data obtained through a questionnaire administered to a random sample of 431 students in 30 classes, which constituted approximately 4.2 percent of the total enrollment. Confidence in the survey was enhanced by the fact that the percentages of resident and nonresident respondents closely reflected their respective percentage of the total enrollment. The student questionnaire was also designed to exclude payments to Murray State and expenditures outside Kentucky.¹³ A copy of the student questionnaire is shown in Appendix B.

Expenditures by visitors from outside Kentucky, West Kentucky and Calloway County who attend University functions and visited University-related persons were based on daily visitor expenditures estimated from travel surveys. The estimated number of day visits was obtained through employee and student questionnaires as well as an assessment by certain University personnel in charge of major functions. Taxes paid to local governments by Murray State University and Murray State-related

¹³ It should be noted that calculations relating to cost are based on the actual numbers of University employees and students involved, whereas the calculations related to benefits included the entire university population. This differentiation was necessary because the surveys estimating expenditures were administered to a cross section of all employees and students which included those residing outside Calloway County, West Kentucky, and Kentucky. The resulting reduction in average expenditures offset the inclusion of the total population.

persons were estimated from data obtained in the employee and student questionnaires and from public officials. The specific sources of these data are presented in Chapter III.

The total impact of Murray State University on the economy of Kentucky, West Kentucky and Calloway County was estimated with regional input-output (I-O) multipliers, known as RIMS (Regional Industrial Multiplier System) calculated by the Bureau of Economic Analysis. This calculation was created specifically for Kentucky, West Kentucky, and Calloway County. The impact on state, regional and local jobs attributed to Murray State University were estimated with RIMS formula, which incorporated appropriate employment and production coefficients for these regions. The expansion of the regional and local credit base was calculated with a RIMS model designed for West Kentucky and Calloway County using loan to deposit ratios. The methodology for these calculations and the data sources are cited in Chapter IV.

Methodology and data sources not previously mentioned are explained and documented as presented throughout the study. A summary of the documents used is presented in the Bibliography, and a list of resource persons is given in Appendix C.

Limitations

The focus of this study was on the impacts of direct expenditures by Murray State University and University-related persons on the economy of Kentucky, West Kentucky and Murray/Calloway County. Included in the analysis is an estimate of additional spending growth through the multiplier effect and the impact on the regional and local job markets and credit bases. While these impacts are substantial, they are not all inclusive. An institution such as Murray State increases the region's

investment in human capital, which is reflected in the increased productivity and income-generating capacity of former students. Murray State alumni benefit the state and region not only in terms of their higher incomes but also through the leadership they provide in community and business life. Special programs and community service activities also benefit the regional economy and quality of life. Finally, Murray State and Murray State personnel have contributed to regional development and increased economic activity. While it was beyond the scope of this study to estimate these impacts, they are nevertheless substantial and perhaps should be the focus of further research.

The presence of Murray State University may also bring noneconomic benefits to the region such as entertainment, cultural activities, a more pluralistic environment, higher quality secondary and elementary schools and improved public services and medical facilities. The presence of Murray State may impose noneconomic costs to the region. These may include increased traffic, crowding of schools, political agitation, or even increased crime. While recognizing the possible existence of these noneconomic costs and benefits, this study was limited to estimating the major short-run economic or monetary costs and benefits of expenditures generated by Murray State University.

Finally, the study was based on the assumption that, if Murray State did not exist, the costs and expenditures associated with Murray State, its employees, students, and visitors, would not occur in the areas defined. This may or may not be the case. In the absence of Murray State, some of its potential employees and students could still be living in the areas defined and engaged in other activities. However, it would be difficult to estimate population patterns, size and skill of the

labor force, and the configuration of the local, regional and state economy without Murray State. Therefore, the analysis was based upon the assumption that, in the absence of Murray State, the costs and benefits would not exist or would be outside the defined areas.

CHAPTER II

COST OF MURRAY STATE UNIVERSITY

The presence of Murray State University imposes additional cost to the residents of Kentucky and West Kentucky including Murray and Calloway County. These costs are both direct and indirect. The major direct costs include the state appropriation to Murray State and state and local government services provided to University-related personnel. The major indirect costs include the loss in real estate taxes foregone through the university's tax exempt status and the competition of University business activities with other economic enterprises in the area.

Cost to Kentucky

The total cost of the university to the residents of Kentucky may be estimated with the following model:

$$(TC_K)_{UR} = (DA_K)_U + (OC_{SG})_{UR} + RL_{UP} + BC_U$$

where:

- $(TC_K)_{UR}$ = total cost to Kentucky from University-related personnel and activities
- $(DA_K)_U$ = direct appropriation by Kentucky to University
- $(OC_{SG})_{UR}$ = operating cost of state government-provided services to University community
- RL_{UP} = revenue lost from University tax-exempted property
- BC_U = business competition by University with private enterprise

The cost of Murray State to the residents of Kentucky is estimated at:

$$\begin{aligned} (TC_K)_{UR} &= \$48,025,100 + \$84,051,198 + \$129,877 \\ &= \$132,206,175 \end{aligned}$$

A summary of the estimated costs of Murray State to the residents of Kentucky is shown in Table 2. A more detailed analysis of the major cost items and the derivation of these costs are presented in the following sections.

TABLE 2
COST OF MURRAY STATE UNIVERSITY TO KENTUCKY

Type of Cost	Dollar Amount
Direct Appropriation	\$ 48,025,100
State Government Services	84,051,198
Revenue Lost From University Property	129,877
TOTAL	\$132,206,175

Direct Appropriation to Murray State

Murray State University is a state-assisted institution. During the 2014-2015 Fiscal Year, the recommended General Fund — Regular appropriation to Murray State University was \$48,025,100.¹⁴

Cost of Government-Provided Services

The Commonwealth of Kentucky provides various services to all residents of the state, including the University Community. These services include, but are not limited to, a state governing body, police protection, judicial system, highways and other transportation facilities and assistance to public education and health care.

The cost of state government-provided services allocable to University-related personnel was calculated as follows:

$$(OC_{SG})_{UR} = POP_{UC} \times (OC_{SG})_C$$

where:

$$(OC_{SG})_{UR} = \text{operating cost of state government-provided services to}$$

¹⁴ 2014-2015 Executive Budget, Budget In Brief, Commonwealth of Kentucky, Ed Ross, Controller, Kentucky Economic Cabinet, Frankfort, Kentucky.

		University community
POP _{UC}	=	population of University
(OC _{SG}) _C	=	operating cost of state government per capita excluding the direct appropriation to Murray State

The population of the Kentucky University community was estimated at 15,246.¹⁵ This sum included the total faculty and staff and the members of their families who live in the state plus the total number of students and other family members of married students who live in the state. The Kentucky faculty and staff household population was estimated at 3,267, and the Kentucky students and student household population was estimated at 11,979.

The operating cost of state government per capita was estimated at \$5,513.¹⁶ The cost of providing state government services to University-related personnel and activities was estimated at:

$$\begin{aligned} (OC_{SG})_{UR} &= 15,246 \times \$5,513 \\ &= \$84,051,198 \end{aligned}$$

A more detailed analysis of the cost of governmental services for the University community is shown in Table 3.

TABLE 3

¹⁵ The Kentucky faculty and staff household population was computed by multiplying the number of faculty and staff, minus those married to other university employees, plus one half the number of those married to other university employees' times the average married household population. The total student household population was counted as the number of students living in Kentucky, minus married students, plus the number of married students living in the state times the average married student household population. Students married to students and university employees married to other university employees were counted as one household to avoid double counting.

¹⁶ Commonwealth of Kentucky, Statement of Revenues expenditures and changes in fund balances for year ended June 30, 2015. Per capita expenditures were calculated by dividing state expenditures during Fiscal Year 2015 of \$24,396,189,000 by population of 4,425,092. Per capita expenditures are averages. While it is recognized that the marginal cost would probably be more accurate measure, marginal cost data is not available and would be difficult to calculate.

COST TO STATE GOVERNMENT FOR SERVICES
PROVIDED THE UNIVERSITY COMMUNITY

University-Related Persons	Number	Expenditures Per Capita	Dollar Amount
University Employees	3,267	\$5,513	\$18,010,971
University Students	11,979	5,513	66,040,227
Total	15,246		\$84,051,198

SOURCE: Calculated from Murray State employee and student survey data; State Government Revenue and Expenditure data; and data from the Tax Foundation, Washington, D.C.

The model estimated the cost of government-provided services with respect to population because of the difficulty of separating people-oriented services and those that are property-oriented. It should be recognized that the population basis for allocating cost of services to a university area has the potential of overestimating such cost by implicitly underestimating the services rendered to business establishments. Businesses are usually capital-intensive whereas a university is usually labor-intensive. The share of government expenditures allocated by the model would be higher for a labor-intensive operation.

Lost Property Tax Revenue

The major indirect cost to Kentucky, because of the presence of Murray State University, is the loss of property taxes due to the university's tax-exempt status.

There are two approaches to calculating the magnitude of the revenue loss. One approach estimates the loss by multiplying the appropriate tax rates by the total value of the state-owned property, which includes land and buildings. The other approach estimates the loss by multiplying the appropriate tax rates by the total value of the land. The losses in each approach are calculated in the following sections.

Revenue Loss from Land and Improvements

The revenue loss to Kentucky on land and improvements owned by Murray State University was calculated with the following model:

$$RL_{UP} = PV_U \times T_K$$

where:

RL_{UP} = revenue lost from University tax-exempted property

PV_U = value of real estate owned by the University

T_K = Kentucky tax rate for real estate

The total value of property owned by Murray State University and located in Kentucky was estimated at \$296,783,956.¹⁷ Included in this sum is the value of all University property at the end of the 2015 Fiscal Year. The tax-exempt, real property owned by Murray State is shown in Table 4.

The state property tax revenue lost in Kentucky, due to University tax-exempted land and buildings, was estimated at:

$$\begin{aligned} RL_{UP} &= \$296,783,956 \times .013729116 \\ &= \$4,074,581 \end{aligned}$$

A more detailed analysis of tax revenue lost to University tax-exempt land and buildings is shown in Table 5.

TABLE 4

MURRAY STATE UNIVERSITY-OWNED TAX-EXEMPTED
REAL PROPERTY IN KENTUCKY

Land	Buildings	Total
------	-----------	-------

¹⁷ Facilities Management Annual Inventory Reports, "Tax-Exempted Real Property for the Year Ended June 30, 2015." The value quoted is 'Book Value' (cost less depreciation).

Type of Property	Acreage	Value	Base Square Ft.	Value	Value
Main Campus	264	\$7,072,309	3,484,980	\$256,092,758	\$263,165,067
Farms	406	374,772	298,478	9,865,504	10,240,276
Biological Station	64	3,002	40,248	1,401,013	1,404,015
Hopkinsville Campus	76	1,030,165	41,533	6,236,394	7,266,559
Breathitt Veterinary Center	15	62,349	50,148	4,460,190	4,522,539
Paducah Campus	23	1,035,000	42,861	9,000,000	10,035,000
Murphy's Pond	279	150,500	-	-	150,500
TOTALS	1,127	\$9,728,097	3,958,248	\$287,055,859	\$296,783,956

SOURCE: Facilities Management Annual Inventory Reports, Murray State University, "Tax Exempted Real Property for the Year Ended June 30, 2015"

TABLE 5
KENTUCKY PROPERTY TAX FORGONE FROM LAND AND
BUILDINGS OWNED BY MURRAY STATE UNIVERSITY

Property	Property Value	Tax Rate	Revenue Lost
Main Campus	\$263,165,067	1.412 per \$100	\$3,715,890
Farms	10,240,276	.845 per 100	86,530
Biological Station	1,404,015	.845 per 100	11,864
Hopkinsville Campus	7,266,559	.998 per 100	72,520
Breathitt Veterinary Center	4,522,539	.998 per 100	45,135
Paducah Campus	10,035,000	1.408 per 100	141,293
Murphy's Pond	150,500	.896 per 100	1,349
TOTALS	\$296,783,956		\$4,074,581

SOURCE: Facilities Management Annual Inventory Reports, Murray State University, and Property Valuation Administrators of Calloway, Christian, McCracken, and Hickman Counties.

Revenue Lost from Land

The revenue lost to Kentucky on land owned by Murray State University was

calculated with the same model that was used for both land and buildings with the exception that PV_U represents the property valuation of only University-owned land. This approach to estimating the true tax loss is preferred because, in the absence of the University, most of the high-valued buildings would not exist. It is recognized that, if the University was not located on the land, some of it would be the site of other improvements. However, any estimate of the value of potential improvements would be highly speculative. Also, more than offsetting those improvements is the increase in housing and business established because of the University.

The property tax foregone from land owned by Murray State and the true cost of the University's tax-exempted status to Kentucky was estimated at:

$$\begin{aligned} RL_{UP} &= \$9,728,097 \times .0133507 \\ &= \$129,877 \end{aligned}$$

A more detailed analysis of tax revenue lost to University tax-exempted land and buildings is shown in Table 6.

TABLE 6

KENTUCKY PROPERTY TAX FORGONE FROM LAND
OWNED BY MURRAY STATE UNIVERSITY

Property	Property Value	Tax Rate	Revenue Lost
Main Campus	\$7,072,309	1.412 per \$100	\$ 99,861
Farms	374,772	.845 per 100	3,167
Biological Station	3,002	.845 per 100	25
Hopkinsville Campus	1,030,165	.998 per 100	10,281
Breathitt Veterinary Center	62,349	.998 per 100	622
Paducah Campus	1,035,000	1.408 per 100	14,573
Murphy's Pond	150,500	.896 per 100	1,348
TOTALS	\$9,728,097		\$129,877

SOURCE: Facilities Management Annual Inventory Reports, Murray State University, and Property Valuation Administrators of Calloway, Christian, McCracken, and Hickman Counties.

Cost to West Kentucky

The total cost of the University to the residents of West Kentucky may be estimated with the following model:

$$(TC_{WK})_{UR} = (OC_{LG})_{UR} + (OC_{PS})_{UR} + RL_{UP} + BC_U$$

where:

- $(TC_{WK})_{UR}$ = total cost to West Kentucky from University-related personnel and activities
- $(OC_{LG})_{UR}$ = operating costs of local government-provided services to University community
- $(OC_{PS})_{UR}$ = operating cost of public schools allocable to University-related persons
- RL_{UP} = revenue lost from University tax-exempted property
- BC_U = business competition by University with private enterprise

The cost of Murray State to the residents of West Kentucky was estimated at:

$$\begin{aligned} (TC_{WK})_{UR} &= \$6,985,314 + \$3,575,458 + \$118,010 \\ &= \$10,678,782 \end{aligned}$$

A summary of the estimated costs of Murray State to the residents of West Kentucky is shown in Table 7.

Cost of Government-Provided Services

The city and county governments in West Kentucky provide various services to the University community. These services include police protection, fire protection, and the provision of a local governing body. Local governments share with the state and federal governments the provision of other services such as highway construction and maintenance, the judicial system, and some types of health care facilities.

TABLE 7

COST OF MURRAY STATE UNIVERSITY TO WEST KENTUCKY

Type of Cost	Dollar Amount
Local Government Services	\$ 6,985,314
Educating University-Related Students	3,575,458
Revenue Lost from University-Owned Property	118,010
TOTAL	\$10,678,782

The cost of local government-provided services allocable to University-related personnel and activities for West Kentucky was calculated as follows:

$$(OC_{LG})_{UR} = POP_{UC} \times (OC_{LG})_C$$

where:

$(OC_{LG})_{UR}$ = operating cost of local, government-provided services to University community

POP_{UC} = population of University community

$(OC_{LG})_C$ = operating cost of local government per capita, excluding public schools

The population of the regional University community was estimated at 15,076.¹⁸ This sum included the total number of faculty and staff and the members of their families who live in the region plus the total number of students and the other family members of married students who live in the region. The regional faculty and staff household population was estimated at 3,267, and the regional students and student household population was estimated at 11,809. The per capita cost of services, excluding public education, provided by local governments in West

¹⁸ The regional faculty and staff household population was computed by multiplying the number of faculty and staff by the average faculty and staff household population. The total student household population was computed as the number of students living in West Kentucky, minus married students, plus the number of married students living in the region, times the average married student household population.

Kentucky was estimated at \$463.34.¹⁹ The cost of providing local government services to University-related personnel and activities was estimated at:

$$\begin{aligned} (OC_{LG})_{UR} &= 15,076 \times \$463.34 \\ &= \$6,985,314 \end{aligned}$$

A more detailed analysis of the cost of government-provided services for the University community is shown in Table 8.

The model estimated the cost of government-provided services with respect to population because of the difficulty of separating people-oriented services with those that are property-oriented. It should be recognized that the population basis for allocating costs of services to a university area has the potential of overestimating such cost by implicitly underestimating the services rendered to business establishments. Businesses are usually capital-intensive, whereas a university is usually labor-intensive. The share of government expenditures allocated by the model would be higher for a labor-intensive operation.

TABLE 8
COST TO LOCAL GOVERNMENT FOR SERVICES
PROVIDED THE UNIVERSITY COMMUNITY

University-Related Persons	Number	Expenditures Per Capita	Total Expenditures
University Faculty and Staff	3,267	\$463.34	\$1,513,732
University Students	11,809	463.34	5,471,582
TOTAL	15,076		\$6,985,314

SOURCE: Calculated from employee and student survey data, Murray State University and Regional Local Government Revenue and Expenditure data.

Cost to Regional School Systems for Educating
University-Related Children

¹⁹ Regional County and Municipal Budgets and Survey Data.

Another major direct cost to the region is providing educational opportunities to University-related children, i.e., children of faculty, staff, and University students. This cost was calculated with the following model:

$$(OC_{PS})_{UR} = [(CH_{PS})_E + (CH_{PS})_S] (AE_{PS})_{WK}$$

where:

- $(OC_{PS})_{UR}$ = operating cost of public schools allocable to University-related persons
- $(CH_{PS})_E$ = number of University employees' children attending public schools in West Kentucky
- $(CH_{PS})_S$ = number of students' children attending public schools in West Kentucky
- $(AE_{PS})_{WK}$ = average expenditures per student attending public schools in West Kentucky

The number of faculty and staff children attending the public schools (Kindergarten through Grade 12) in West Kentucky was estimated at 584. The number of Murray State University married students' children attending the public schools (K-12) was estimated at 822. The average cost to local governments for students attending public schools in West Kentucky was estimated at \$2,543.²⁰ The total cost to the local school systems in West Kentucky for educating University-related children was estimated as:

$$\begin{aligned} (OC_{PS})_{UR} &= (584 + 822) (\$2,543) \\ &= \$ 3,575,458 \end{aligned}$$

A more detailed analysis of the cost of educating University-related students is shown in Table 9.

TABLE 9

²⁰ Kentucky Department of Education, Calloway County Schools and Murray Independent Schools.

COST TO REGIONAL SCHOOL SYSTEMS FOR
EDUCATING UNIVERSITY-RELATED CHILDREN

University-Related Students	Number	Expenditure Per Pupil	Total Expenditures
University Faculty and Staff	584	\$2,543	\$1,485,112
University Students	822	2,543	2,090,346
TOTAL	1,406		\$3,575,458

SOURCE: Calculated from survey data and data provided by the Calloway County School System, Murray Independent School System, and the Kentucky Department of Education.

Lost Property Tax Revenue

The major indirect cost to West Kentucky because of the presence of Murray State University is the loss of property taxes due to the University's tax-exempt status.

Again, two approaches are used to calculate the loss. One approach estimates the loss by multiplying the appropriate tax rates by the total value of the state-owned property, which includes land and buildings. The other approach estimates the loss by multiplying the appropriate rates by the total value of the land. The losses in each approach are calculated in the following sections.

Revenue Loss from Land and Improvements

The revenue loss to West Kentucky on land and improvements owned by Murray State University was calculated with the following model:

$$\begin{aligned}
 RL_{UP} &= (PV_U \times T_C) + (PV_U \times T_{C,M}) + (PV_U \times T_{C,H}) + (PV_U \times T_{M,P}) \\
 &\quad + (PV_U \times T_H)
 \end{aligned}$$

where:

- RL_{UP} = revenue lost from University tax-exempted property
- PV_U = value of real estate owned by the University

- T_C = tax rate for property subject to Calloway County taxes only
- T_{C,M} = tax rate for property subject to both Calloway County and City of Murray
- T_{C,H} = tax rate for property subject to both Christian County and City of Hopkinsville
- T_{M,P} = tax rate for property subject to both McCracken County and City of Paducah
- T_H = tax rate for property subject to Hickman County

The total value of property owned by Murray State University and located in West Kentucky was estimated at \$296,783,956. ²¹ Included in this sum is the value of all University property at the end of the 2015 Fiscal Year. The tax-exempt, real property owned by Murray State is shown in Table 10.

The local property tax revenue lost in West Kentucky due to University tax-exempted land and buildings was estimated at:

$$\begin{aligned}
 RL_{UP} &= (\$11,644,291 \times .00723) + (\$263,165,067 \times .0129) \\
 &+ (\$11,789,098 \times .00876) + (\$10,035,000 \times .01286) \\
 &+ (\$150,500 \times .00774) \\
 &= \$3,712,504
 \end{aligned}$$

A more detailed analysis of tax revenue lost to University tax-exempted land and buildings is shown in Table 11.

TABLE 10

²¹ Facilities Management Annual Inventory Reports, Murray State University, "Tax-Exempted Real Property For the Year Ended, June 30, 2015."

MURRAY STATE UNIVERSITY-OWNED, TAX-EXEMPTED
REAL PROPERTY IN WEST KENTUCKY

Type of Property	Land		Buildings		Total Value
	Acreage	Value	Base Sq. Ft.	Value	
Main Campus	264	\$7,072,309	3,484,980	\$256,092,758	\$263,165,067
Farms	406	374,772	298,478	9,865,504	10,240,276
Biological Station	64	3,002	40,248	1,401,013	1,404,015
Hopkinsville Campus	76	1,030,165	41,533	6,236,394	7,266,559
Breathitt Veterinary Center	15	62,349	50,148	4,460,190	4,522,539
Paducah Campus	23	1,035,000	42,861	9,000,000	10,035,000
Murphy's Pond	279	150,500	-	-	150,500
TOTALS	1,127	\$9,728,097	3,958,248	\$287,055,859	\$296,783,956

SOURCE: Facilities Management Annual Inventory Reports, Murray State University, "Tax Exempted Real Property for the Year Ended June 30, 2015."

Revenue Loss from Land

The revenue loss to West Kentucky on land owned by Murray State was calculated with the same model that was used for both land and buildings, with the exception that PV_U represents property valuation of only University-owned land. This approach to estimating the true tax loss is preferred because, in the absence of the University, most of the high-valued buildings would not exist. It is recognized that, if the University was not located on the land, some of it would be the site of other improvements. However, any estimate of the value of potential improvements would

TABLE 11

REGIONAL PROPERTY TAX FORGONE FROM LAND AND
BUILDINGS OWNED BY MURRAY STATE UNIVERSITY

Property	Property Value	Tax Rate*	Revenue Lost
Main Campus	\$263,165,067	1.29 per \$100	\$3,394,829
Farms	10,240,276	.723 per 100	74,037
Biological Station	1,404,015	.723 per 100	10,151
Hopkinsville Campus	7,266,559	.876 per 100	63,655
Breathitt Veterinary Center	4,522,539	.876 per 100	39,617
Paducah Campus	10,035,000	1.286 per 100	129,050
Murphy's Pond	150,500	.774 per 100	1,165
TOTALS	\$296,783,956		\$3,712,504

SOURCE: Facilities Management Annual Inventory Reports, Murray State University, and Property Valuation Administrators of Calloway, Christian, McCracken, and Hickman Counties.

*Tax Rate after deduction of \$.1220 per \$100 payable to the Commonwealth of Kentucky

be highly speculative. Also, more than offsetting those improvements is the increase in housing and business established because of the University.

The property tax foregone from land owned by Murray State University and the true cost of the University's tax-exempted status to West Kentucky was estimated at:

$$\begin{aligned}
 RL_{UP} &= (\$377,774 \times .00723) + (\$7,072,309 \times .0129) \\
 &+ (\$1,092,514 \times .00876) + (\$1,035,000 \times .01286) \\
 &+ (\$150,500 \times .00774) \\
 &= \$118,010
 \end{aligned}$$

A more detailed analysis of tax revenue lost due to University tax-exempted land is shown in Table 12.

TABLE 12

REGIONAL PROPERTY TAX FORGONE FROM LAND
OWNED BY MURRAY STATE UNIVERSITY

Property	Property Value	Tax Rate*	Revenue Lost
Main Campus	\$7,072,309	1.29 per \$100	\$ 91,233
Farms	374,772	.723 per 100	2,710
Biological Station	3,002	.723 per 100	22
Hopkinsville Campus	1,030,165	.876 per 100	9,024
Breathitt Veterinary Center	62,349	.876 per 100	546
Paducah Campus	1,035,000	1.286 per 100	13,310
Murphy's Pond	150,500	.774 per 100	1,165
TOTALS	\$9,728,097		\$118,010

SOURCE: Facilities Management Annual Inventory Reports, Murray State University, and Property Valuation Administrators of Calloway, Christian, McCracken, and Hickman Counties.

*Tax Rate after deduction of .1220 per \$100 payable to the Commonwealth of Kentucky

Cost to Murray and Calloway County

The presence of Murray State University imposes additional direct and indirect costs to the residents of Murray and Calloway County. The major direct costs include government-provided services allocable to University-related personnel and activities. The major indirect costs include the loss in real estate taxes foregone through the University's tax-exempt status and the competition by University business activities with other economic enterprises in the community.

The total cost of the University to the residents of Murray and Calloway County may be estimated with the following model:

$$(TC_{LC})_{UR} = (OC_G)_{UR} + (OC_{PS})_{UR} + RL_{UP} + BC_U$$

where:

$(TC_{LC})_{UR}$ = total cost to the local community from University-related personnel and activities

$(OC_G)_{UR}$ = operating cost of local government-provided services to University community

$(OC_{PS})_{UR}$ = operating cost of local public schools allocable to University-related persons

RL_{UP} = revenue lost from University tax-exempted property

BC_U = business competition by University with private enterprise

The cost of Murray State to the residents of Murray and Calloway County was estimated at:

$$\begin{aligned}(TC_{LC})_{UR} &= \$5,972,916 + \$2,301,695 + \$93,965 \\ &= 8,368,576\end{aligned}$$

A summary of the estimated costs of Murray State to the residents of Murray and Calloway County are shown in Table 13. A more detailed analysis of the major cost items and the derivation of those costs are presented in the following sections.

Cost of Government-Provided Services

The City of Murray and Calloway County governments provide various services to the University community. These services include police protection, fire protection,

TABLE 13
COST MURRAY STATE UNIVERSITY TO MURRAY
AND CALLOWAY COUNTY

Type of Cost	Dollar Amount
Local Government Services	\$5,972,916
Education University Related Students	2,301,695
Revenue Lost from University-Owned Property	93,965
TOTAL	\$8,368,576

and the provision of a local governing body. Local governments share with the state and federal governments the provision of other services such as highway construction maintenance, the judicial system, public secondary and elementary education, and some types of health care facilities.

The cost of local government-provided services allocable to University-related personnel and activities may be calculated as follows:

$$(OC_G)_{UR} = \frac{B_{LG}}{POP_{LR}} \times POP_{UC}$$

where:

- $(OC_G)_{UR}$ = operating cost of local government-provided services to University community
- POP_{UC} = population of University community
- POP_{LR} = total local resident population
- B_{LG} = budget for local governments, excluding public schools

The population of the local University community was estimated at 12,891²². This sum included the total number of faculty and staff and the members of their families who live in the local community, plus the total number of students and the other family members of students who live in the local community. The local faculty and staff household population was estimated at 2,698, and the local students and student household population was estimated at 10,193.

The population of the City of Murray and Calloway County was estimated at 18,954 and 38,343 respectively, in 2015.²³ Total budget expenditures for the City of Murray for Fiscal Year 2015 were \$8,766,776.²⁴ Total budget expenditures for Calloway County for Fiscal Year 2015 were \$7,481,612.²⁵ Total expenditures by the Offices of the Sheriff and the County Court Clerk were \$1,517,617.²⁶ The combined city and county expenditures for the 2015 Fiscal Year were \$17,766,005. The cost of providing local government services to University-related personnel and activities was estimated at:

$$\begin{aligned} (\text{OCG})_{\text{UR}} &= \frac{17,766,005}{38,343} \times 12,891 \\ &= \$5,972,916 \end{aligned}$$

²² The local faculty and staff household population was computed by multiplying the number of faculty and staff household population by the average faculty and staff household population. The total student household population was computed as the number of students living in Calloway County, minus married students, plus the number of married students living locally, times the average married student household population. Students married to students and University employees married to other University employees were counted as one household to avoid double counting.

²³ U.S. Department of Commerce, Bureau of the Census, Washington, D.C.

²⁴ Luke Crawford, Director of Finance, City of Murray, Audited Financial Statements, June 30, 2015.

²⁵ Anita P. Gallimore, Treasurer, Calloway County, Treasurer's Final Settlement, Fiscal Year Ending June 30, 2015.

²⁶ Dana Sheridan, Administrative Office Personnel Supervisor, Calloway County Sheriff's office and Antonia Faulkner, Calloway County Clerk.

A more detailed analysis of the cost of governmental services for the University community is shown in Table 14. The variation in sums is due to rounding.

The model estimated the cost of government-provided services with respect to population because of the difficulty of separating people-oriented services and those that are property-oriented. It should be recognized that the population basis for

TABLE 14
COST OF LOCAL GOVERNMENT SERVICES PROVIDED
THE UNIVERSITY COMMUNITY

Governmental Unit	Number University Related Persons	Expenditure Per Capita	Total Expenditures
City of Murray			
University Employees	2,698	\$228.64	\$ 616,870
University Students	10,193	228.64	2,330,528
Calloway County			
University Employees	2,698	195.123	526,434
University Students	10,193	195.123	1,988,858
Special Districts			
University Employees	2,698	39.58	106,787
University Students	10,193	39.58	403,439
TOTAL			\$5,972,916

SOURCE: Calculated from data provided by City of Murray and Calloway County Governments.

allocating costs of services to a university area has potential of overestimating such cost by implicitly underestimating the services rendered to business establishments. Businesses are usually capital-intensive whereas a university is usually labor-intensive. The share of government expenditures allocated by the model would be higher for a labor-intensive operation.

Cost to Local School Systems for Educating University-Related Children

Another major direct cost to the local community is providing educational opportunities to University-related children, i.e., children of faculty, staff, and University students. This cost was calculated with the following model:

$$(OC_{PS})_{UR} = [(CH_{CS})_E + (CH_{CS})_S] (C_{CS}) + [(CH_{IS})_E + (CH_{IS})_S] (C_{IS})$$

where:

$(OC_{PS})_{UR}$	=	operating cost of local public schools allocable to University Related persons
$(CH_{CS})_E$	=	number of University employees' children attending county schools
$(CH_{CS})_S$	=	number of University students' children attending county Schools
(C_{CS})	=	cost per student attending county schools
$(CH_{IS})_E$	=	number of University employees' children attending city schools
$(CH_{IS})_S$	=	number of University students' children attending city schools
(C_{IS})	=	cost per student attending city schools

The estimated number of University employees' children and the estimated students' children attending Calloway County Schools (K-12) was 287 and 308 respectively. The estimated number of University employees' children and the estimated University students' children attending Murray Independent Schools (K-12) were 207 and 103 respectively.

Total public funding per student for Calloway County Schools and Murray Independent Schools during the 2015 Fiscal Year was \$8,438 and \$11,972

respectively. ²⁷ Local public funds provided per student for Calloway County Schools was \$2,631 during the 2014-2015 Fiscal Year. ²⁸ Local public funding per student for Murray Independent Schools was \$2,375 during the 2014-2015 Fiscal Year. ²⁹

Although the majority of state and some federal funds received by the local school districts is generated at the local level, the receipt of those funds is largely determined by average daily attendance and thus student enrollment. Therefore, local public funding was taken to be a more appropriate measure of the cost to local residents of educating University-related students.

The total cost to the local school systems for educating University-related children was estimated as:

$$\begin{aligned}(\text{OC}_{\text{PS}})_{\text{UR}} &= (287 + 308) (\$2,631) + (207 + 103) (\$2,375) \\ &= \$1,565,445 + 736,250 \\ &= \$2,301,695\end{aligned}$$

A more detailed analysis of the cost of educating University-related students is shown in Table 15.

Lost Property Tax Revenue

The major indirect cost to Murray and Calloway County because of the presence of Murray State University is the loss of property taxes due to the University's tax-exempt status.

Two approaches were utilized to calculate the magnitude of the revenue loss. One approach estimated the loss by multiplying the appropriate tax rates by the total value of the state-owned property, which includes land and buildings. The other

²⁷ Amy Owens, Finance Officer, Calloway County Schools and Sara Kaegi, Finance Officer, Murray Independent Schools, Murray, Kentucky.

²⁸ Amy Owens, Finance Officer, Calloway County Schools, Murray, Kentucky.

²⁹ Sara Kaegi, Finance Officer, Murray Independent Schools, Murray, Kentucky.

TABLE 15

COST TO LOCAL SCHOOL SYSTEMS FOR EDUCATING
UNIVERSITY-RELATED CHILDREN

School System	Number University Related Persons	Expenditures Per Capita	Total Expenditures
Calloway County			
University Employees	287	\$2,631	\$ 755,097
University Students	308	2,631	810,348
Murray Independent			
University Employees	207	2,375	491,625
University Students	103	2,375	244,625
TOTAL			\$2,301,695

SOURCE: Calculated from survey data and data provided by Calloway County and Murray Independent School officials and the Kentucky Department of Education.

approach estimates the loss by multiplying the appropriate tax rates by the total value of the land. The losses in each approach are calculated in the following sections.

Revenue Loss from Land and Improvements

The revenue loss to Murray and Calloway County on land and improvements owned by Murray State University was calculated with the following model:

$$RL_{UP} = (PV_U \times T_C) + (PV_U \times T_{C,M})$$

where:

RL_{UP} = revenue lost from University, tax-exempted property

PV_U = value of real estate owned by the University

T_C = tax rate for property subject to county taxes only

$T_{C,M}$ = tax rate for property subject to both county and city taxes

The total value of property owned by Murray State University and located in Calloway County was estimated at \$274,809,358.³⁰ Included in this sum is the value of all University property at the end of the 2015 Fiscal Year.

The local property tax revenue lost due to University, tax-exempted land and buildings was estimated at:

$$\begin{aligned} \text{RL}_{\text{UP}} &= (\$11,644,291 \times .00723) + (\$263,165,067 \times .0129) \\ &= \$3,479,017 \end{aligned}$$

A more detailed analysis of tax revenue lost due to University, tax-exempted land and buildings is shown in Table 16.

TABLE 16
LOCAL PROPERTY TAX FORGONE FROM LAND AND BUILDINGS
OWNED BY MURRAY STATE UNIVERSITY

Property	Property Value	Tax Rate*	Revenue Lost
Main Campus	\$263,165,067	\$1.29 per \$100	\$3,394,829
Farms	10,240,276	.723 per 100	74,037
Biological Station	1,404,015	.723 per 100	10,151
TOTALS	\$274,809,358		\$3,479,017

SOURCE: Facilities Management Annual Inventory Reports, Murray State University, and Property Valuation Administrators of Calloway, County.

*Tax Rate after deduction of \$.1220 per \$100 payable to the Commonwealth of Kentucky

Revenue Loss from Land

³⁰ Facilities Management Annual Inventory Reports, Murray State University, "Tax Exempted Real Property for the Year Ended, June 30, 2015.

The revenue loss to Murray and Calloway County on land owned by Murray State University was calculated with the same model that was used for both land and buildings with the exception that PV_U represents the valuation of only University-owned land. This approach to estimating the true tax loss is preferred because, in the absence of the University, most of the high-valued buildings would not exist. It is recognized that, if the University were not located on the land, some of it would be the site of other improvements. Also, more than offsetting those improvements is the increase in housing and businesses located in the community because of the University.

The property tax foregone from land owned by Murray State and the true cost of the University's tax exempt status to Murray and Calloway County was estimated at:

$$\begin{aligned} RL_{UP} &= (\$377,774 \times .00723) + (\$7,072,309 \times .0129) \\ &= \$93,965 \end{aligned}$$

A more detailed analysis of tax revenue lost due to University tax-exempted land is shown in Table 17.

Cost of University Competition with Local Businesses

Another indirect cost of Murray State University to the local community is the University's competition with business. The University provides a variety of goods and services to the local community and, in some cases, receives revenues which would have gone to the private sector. For example, Murray State provides student housing, which competes with rental property; food services, which compete with local restaurants; book stores, which compete with merchants; films, which compete with local theaters; and other kinds of recreation, which compete with private enterprise.

TABLE 17
 LOCAL PROPERTY TAX FORGONE FROM LAND
 OWNED BY MURRAY STATE UNIVERSITY

Property	Property Value	Tax Rate*	Revenue Lost
Main Campus	\$7,072,309	1.29 per \$100	\$91,233
Farms	374,772	.723 per 100	2,710
Biological Station	3,002	.723 per 100	22
TOTALS	\$7,450,083		\$93,965

SOURCE: Facilities Management Annual Inventory Reports, Murray State University, and Property Valuation Administrators of Calloway, County.

*Tax Rate after deduction of \$.1220 per \$100 payable to the Commonwealth of Kentucky

Given the present situation, it is obvious that Murray State University receives revenue from a variety of goods and services which could be supplied by the private sector. However, it is realistic to believe that this loss is more than offset by the business created by the University for the private sector. For example, the number of rental properties, restaurants, stores, theaters, and other recreational facilities per capita are greater in Calloway County than in other West Kentucky counties which do not have institutions of higher education. Also, it would be extremely difficult, if not impossible, to accurately measure the indirect loss to the community from University business activities.

DIRECT BENEFITS OF MURRAY STATE UNIVERSITY

Expenditures related to Murray State University result in monetary injections which are beneficial to the economy of Kentucky, West Kentucky, and Murray and Calloway County. Murray State-related expenditures include those by the University, University Foundation, Alumni Association, University-related personnel, visitors, and taxes paid by the University and University-related personnel. Expenditures by Murray State include the purchase of goods and services, outlays for construction and maintenance activities, and local taxes paid on utilities. Expenditures by University-related personnel include purchases by University employees and students for goods and services and taxes paid on personal and real property, utilities, and insurance. Expenditures by visitors to the campus and to University employees and students include the purchase of goods and services. These direct injections foster secondary benefits with repetitive spending of the dollars throughout the state.

Benefits to Kentucky

The University-related expenditures which directly benefit the economy of Kentucky were estimated with the formula:

$$(E_K)_{UR} = (E_K)_U + (E_K)_E + (E_K)_S + (E_K)_V + (T_K)_{UES}$$

where:

$(E_K)_{UR}$	=	total benefits to Kentucky from University-related expenditures
$(E_K)_U$	=	expenditures in Kentucky by the University
$(E_K)_E$	=	expenditures in Kentucky by University employees
$(E_K)_S$	=	expenditures in Kentucky by University students
$(E_K)_V$	=	expenditures by out-of-state visitors to University

functions and personnel

$(T_K)_{UES} =$ taxes paid in Kentucky by the University, University employees, and students

The estimated University-related expenditures which directly benefit the economy of Kentucky were:

$$\begin{aligned} (E_K)_{UR} &= \$35,482,086 + \$56,585,455 + \$144,288,630 \\ &+ \$6,300,989 + \$18,169,514 \\ &= \$260,826,674 \end{aligned}$$

These expenditures are shown in Table 20. The components and derivation of these are shown in the following sections.

TABLE 18
ESTIMATED EXPENDITURES IN KENTUCKY FOR FY 2015-2016
BY THE UNIVERSITY COMMUNITY

Source of Expenditures	Dollar Amount
University	\$ 35,482,086
University Employees	56,585,455
University Students	144,288,630
Visitors	6,300,989
Taxes	18,169,514
Total	\$260,826,674

Murray State Purchases

Murray State University has a direct impact on the total amount of sales generated in the Kentucky economy through institutional purchases of goods and services and capital construction outlays. The purchases in Kentucky by the University were calculated by the formula:

$$(E_K)_{UR} = P_{UB} + P_{UF} + P_{UAS} + (C_{K/6})_U$$

where:

- $(E_K)_{UR}$ = total benefits to Kentucky from University-related expenditures
- P_{UB} = purchases in Kentucky through University budget
- P_{UF} = purchases in Kentucky through University Foundation
- P_{UAS} = purchases in Kentucky through University Alumni Association
- $(C_{K/6})_U$ = capital expenditures in Kentucky for the year using the past six years as a base

Using the above formula, the total purchases of goods and services and capital outlays in Kentucky were estimated at:

$$\begin{aligned} (E_K)_U &= \$23,137,317 + \$1,913,985 + \$17,024 + \$10,413,760 \\ &= \$35,482,086 \end{aligned}$$

A more detailed account of these purchases is shown in the following sections.

Budget Expenditures

The estimated purchases of goods and services in Kentucky through the University budget for fiscal year 2014-2015 are shown in Table 21. The categories of expenditures are shown in the first column, the total amount in the second column, and the total expenditures in Kentucky is shown in the third column. The total expenditures for each category was compiled from the University budget. The amount from each category purchased in Kentucky was estimated by University accountants through an analysis of expense vouchers.

Foundation Expenditures

The estimated purchases of goods and services in Kentucky through the University Foundation for Fiscal Year 2014-2015 are shown in Table 22. The items purchased are shown in the first column, the total purchases are shown in the second column, and the total purchases made in Kentucky are shown in the third column.

University Alumni Association Expenditures

The estimated purchases of goods and services in Kentucky through the University Alumni Association for Fiscal Year 2014-2015 are shown in Table 23. The categories of expenditures are shown in the first column, the total purchases are shown in the second column, and the total purchases made in Kentucky are shown in the third column.

Capital Construction

The estimate for capital construction expenditures for Fiscal Year 2014-2015 was based on the average expenditures for fiscal years 2010-2015. A summary of the expenditures for capital construction projects in Kentucky by Murray State University is shown in Table 24. The estimated annual expenditure in Kentucky, based on a six-year average was \$10,413,760.

TABLE 19

ESTIMATED UNIVERSITY BUDGET EXPENDITURES FOR
GOODS AND SERVICES PURCHASED DURING
FISCAL YEAR 2014-2015

Item	Total Purchases	Total Kentucky
Service Contracts	\$ 2,786,771	\$1,446,649
Electricity	4,415,803	4,414,793
Natural Gas	906,362	906,362
Water/Sewage	577,643	577,643
Other Utilities	171,558	96,794
Telephone/Computer Systems	170,825	1,585
Rentals	500,302	184,155
Operations Maintenance	2,398,881	1,587,551
Postage/Freight	477,341	144,593
Marketing/Publicity/Advertising	922,994	522,495
Insurance (Non-Health & Life)	1,200,021	1,128,361
Scholarships Paid to Students	13,248,132	-
Other Services	4,303,653	728,015
Operating Supplies	3,097,765	1,252,149
Inventory Purchases	8,297,848	982,126
Agricultural Supplies	67,699	60,512
Subscriptions/Dues/Awards	1,623,893	240,124
Travel	3,788,395	1,503,969
Capital Outlay	6,655,992	4,474,591
Other Purchases	6,950,880	2,884,850
Total Goods and Services	\$62,562,758	\$23,137,317
Debt Service	\$7,131,609	-
TOTAL	\$69,694,367	\$23,137,317

SOURCE: Ellen Dale, Director of Accounting and Financial Services; Stephanie Jennings, Assistant Director, General Accounting; Jason Royalty, Assistant Director, Reporting.

TABLE 20

ESTIMATED UNIVERSITY FOUNDATION EXPENDITURES FOR
GOODS AND SERVICES PURCHASED DURING
FISCAL YEAR 2014-2015

Item	Total Purchases	Total Kentucky
Service Contracts	\$75,930	\$18,689
Electricity	25,157	25,157
Natural Gas	1,229	1,229
Water/Sewage	4,257	4,257
Other Utilities	4,702	1,786
Telephone/Computer Systems	-	-
Rentals	64,386	5,041
Operations Maintenance	50,100	37,253
Postage/Freight	6,189	3,500
Marketing/Publicity/Advertising	25,269	10,956
Insurance (Non-Health & Life)	50,393	1,249
Scholarships Paid to Students	1,438,093	1,438,093
Other Services	100,697	25,332
Operating Supplies	40,073	18,319
Inventory Purchases	26,453	-
Agricultural Supplies	29,163	1,200
Subscriptions/Dues/Awards	220,297	134,516
Travel	69,389	38,337
Capital Outlay	53,805	-
Other Purchases	400,293	149,071
TOTAL	\$2,685,875	\$1,913,985

SOURCE: Ellen Dale, Director of Accounting and Financial Services, and Dr. Robert L. Jackson, President, Murray State Foundation, Inc.

TABLE 21

ESTIMATED UNIVERSITY ALUMNI ASSOCIATION EXPENDITURES FOR
GOODS AND SERVICES PURCHASED DURING
FISCAL YEAR 2014-2015

Item	Total Purchases	Total Kentucky
Service Contracts	\$ 7,362	\$ 1,528
Rentals	500	300
Marketing/Publicity/Advertising	7,893	7,893
Food Services	6,681	6,681
Other Supplies	1,188	622
TOTAL	\$23,624	\$17,024

SOURCE: Ellen Dale, Director of Accounting and Financial Services.

TABLE 22
EXPENDITURES FOR CAPITAL CONSTRUCTION PROJECTS

Fiscal Year	Total Expenditures	Expenditures Kentucky
2009-2010	\$12,209,775	\$10,330,296
2010-2011	6,123,566	4,539,324
2011-2012	11,911,030	10,150,595
2012-2013	9,965,618	8,202,201
2013-2014	15,921,505	15,232,136
2014-2015	16,549,877	14,028,009
Total	\$72,681,371	\$62,482,561
6 Year Average	\$12,113,562	\$10,413,760

SOURCE: Ellen Dale, Director of Accounting and Financial Services; Stephanie Jennings, Assistant Director, General Accounting; Jason Royalty, Assistant Director, Reporting.

Purchases by University Employees

Expenditures for goods and services by Murray State employees have a direct impact on the economy of Kentucky. The purchases by University employees in Kentucky were calculated with the formula:

$$(E_K)_E = (E_K)_A + (E_K)_F + (E_K)_S$$

where:

- $(E_K)_E$ = expenditures in Kentucky by University employees
- $(E_K)_A$ = expenditures in Kentucky by administrative personnel
- $(E_K)_F$ = expenditures in Kentucky by teaching faculty
- $(E_K)_S$ = expenditures in Kentucky by staff personnel

The estimated expenditures for goods and services in Kentucky by Murray State employees were:

$$\begin{aligned} (E_K)_E &= \$16,981,686 + \$19,749,184 + \$19,854,585 \\ &= \$56,585,455 \end{aligned}$$

The estimated expenditures by University administrators in Kentucky during the 2015-2016 Fiscal Year were \$16,981,686. University administrators were defined, for the purpose of this study, as executive, administrative, managerial, and professional non-faculty. There were 402 households representing the 420 employees in this category during the 2015-2016 Fiscal Year.³¹ The estimated purchases of University administrators are shown in Table 25.

³¹ Sharon A Melone, Executive Coordinator, Finance and Haley Stedelin, Manager of Employment and Compensation, Murray State University.

The estimated expenditures by University faculty in Kentucky during the 2015-2016 Fiscal Year were \$19,749,184. University faculty were defined as those whose primary duties include teaching and research. There were 448 households representing the 488 University employees in this category during the 2015 Fiscal Year.³² The estimated purchases by University faculty is shown in Table 26.

The estimated expenditures by University staff personnel in Kentucky during the 2015-2016 Fiscal Year were \$19,854,585. University staff personnel included office, clerical, and sales workers; technical and paraprofessional workers; skilled crafts workers; and service/maintenance workers. There were 549 households representing the 551 employees in this category during the 2015-2016 Fiscal Year.³³ The estimated purchases by University staff personnel is shown in Table 27.

TABLE 23

ESTIMATED EXPENDITURES OF UNIVERSITY ADMINISTRATORS IN
KENTUCKY DURING FISCAL YEAR 2014-2015

³² Ibid.

³³ Ibid.

Type of Expenditure	Total Average Expenditure	Total Dollar Amount for Administrators
Rent or House Payment	\$ 9,254	\$ 3,720,108
Homeowners or Renters' Insurance	1,277	513,354
Utilities and Phone	3,987	1,602,774
Maintenance and Other Housing Expenditures	1,294	520,188
Food and Non-Alcoholic Beverages	5,391	2,167,182
Alcoholic Beverages	591	237,582
Tobacco Products	117	47,034
Soap, Cosmetics, and Paper Products	668	268,536
Drugs and Medicine	757	304,314
Other Nondurables (Kitchen Aids, etc.)	406	163,212
Gasoline and Oil	2,154	865,908
Auto Repair and Maintenance	508	204,216
Auto Insurance	1,548	622,296
Non-University Parking	45	18,090
Other Transportation (Train/Plane)	657	264,114
Clothing and Accessories	1,174	471,948
Doctors, Dentists, and Hospitals	813	326,826
Health and Life Insurance (Non-University)	1,519	610,638
Instruction Lessons	358	143,916
Rentals	52	20,904
Laundry and Other Services	298	119,796
Appliances and Furniture	535	215,070
Sporting and Recreational Equipment	194	77,988
Automobiles and Trucks	2,826	1,136,052
Recreation	583	234,366
Hobbies	224	90,048
Entertainment	1,185	476,370
Charities	2,800	1,125,600
Gifts	1,028	413,256
Total	\$42,243	\$16,981,686

Source: Calculated from data attained through survey of University administrators, faculty and staff.

TABLE 24

ESTIMATED EXPENDITURES OF UNIVERSITY FACULTY IN
KENTUCKY DURING FISCAL YEAR 2014-2015

Type of Expenditure	Total Average Expenditure	Total Dollar Amount for Faculty
Rent or House Payment	\$ 9,536	\$ 4,272,128
Homeowners or Renters' Insurance	2,115	947,520
Utilities and Phone	3,932	1,761,536
Maintenance and Other Housing Expenditures	1,746	782,208
Food and Non-Alcoholic Beverages	5,721	2,563,008
Alcoholic Beverages	613	274,624
Tobacco Products	20	8,960
Soap, Cosmetics, and Paper Products	636	284,928
Drugs and Medicine	821	367,808
Other Nondurables (Kitchen Aids, etc.)	458	205,184
Gasoline and Oil	1,696	759,808
Auto Repair and Maintenance	653	292,544
Auto Insurance	1,324	593,152
Non-University Parking	13	5,824
Other Transportation (Train/Plane)	1,070	479,360
Clothing and Accessories	1,233	552,384
Doctors, Dentists, and Hospitals	1,168	523,264
Health and Life Insurance (Non-University)	983	440,384
Instruction Lessons	595	266,560
Rentals	332	148,736
Laundry and Other Services	216	96,768
Appliances and Furniture	612	274,176
Sporting and Recreational Equipment	108	48,384
Automobiles and Trucks	1,968	881,664
Recreation	536	240,128
Hobbies	158	70,784
Entertainment	1,224	548,352
Charities	3,840	1,720,320
Gifts	756	338,688
Total	\$44,083	\$19,749,184

Source: Calculated from data attained through survey of University administrators, faculty and staff.

TABLE 25

ESTIMATED EXPENDITURES OF UNIVERSITY STAFF IN
KENTUCKY DURING FISCAL YEAR 2014-2015

Type of Expenditure	Total Average Expenditure	Total Dollar Amount for Staff
Rent or House Payment	\$ 6,476	\$ 3,555,324
Homeowners or Renters' Insurance	1,749	960,201
Utilities and Phone	4,031	2,213,019
Maintenance and Other Housing Expenditures	1,394	765,306
Food and Non-Alcoholic Beverages	5,537	3,039,813
Alcoholic Beverages	339	186,111
Tobacco Products	240	131,760
Soap, Cosmetics, and Paper Products	698	383,202
Drugs and Medicine	615	337,635
Other Nondurables (Kitchen Aids, etc.)	476	261,324
Gasoline and Oil	2,202	1,208,898
Auto Repair and Maintenance	417	228,933
Auto Insurance	1,920	1,054,080
Non-University Parking	90	49,410
Other Transportation (Train/Plane)	172	94,428
Clothing and Accessories	1,113	611,037
Doctors, Dentists, and Hospitals	820	450,180
Health and Life Insurance (Non-University)	1,099	603,351
Instruction Lessons	289	158,661
Rentals	355	194,895
Laundry and Other Services	92	50,508
Appliances and Furniture	438	240,462
Sporting and Recreational Equipment	141	77,409
Automobiles and Trucks	2,663	1,461,987
Recreation	296	162,504
Hobbies	145	79,605
Entertainment	689	378,261
Charities	679	372,771
Gifts	990	543,510
Total	\$36,165	\$19,854,585

Source: Calculated from data attained through survey of University administrators, faculty and staff.

TABLE 26

ESTIMATED EXPENDITURES OF UNIVERSITY STUDENTS IN
KENTUCKY DURING FISCAL YEAR 2014-2015

Type of Expenditure	Total Average Expenditure	Total Dollar Amount for Students
Rent or House Payment	\$ 3,786	\$ 38,867,076
Homeowners or Renters' Insurance	342	3,510,972
Utilities and Phone	1,155	11,857,230
Maintenance and Other Housing	490	5,030,340
Food and Non-Alcoholic Beverages	1,349	13,848,834
Alcoholic Beverages	256	2,628,096
Tobacco Products	76	780,216
Dining Out	555	5,697,630
Fast Food	389	3,993,474
Soap, Cosmetics, and Paper Products	263	2,699,958
Drugs and Medicine	156	1,601,496
Other Nondurables	164	1,683,624
Gasoline and Oil	697	7,155,402
Auto Repair and Maintenance	172	1,765,752
Auto Insurance	758	7,781,628
Other Transportation Expenses	80	821,280
Clothing and Accessories	493	5,061,138
Doctors and Dentists	270	2,771,820
Health and Life Insurance	360	3,695,760
Instruction Lessons	101	1,036,866
Rentals	103	1,057,398
Laundry and Other Services	68	698,088
Appliance and Furniture	219	2,248,254
Sporting and Recreational Equipment	85	872,610
Automobiles and Trucks	520	5,338,320
Recreation	120	1,231,920
Hobbies	139	1,426,974
Entertainment	483	4,958,478
Charities	179	1,837,614
Gifts	227	2,330,382
Total	\$14,055	\$144,288,630

Source: Calculated from data attained through survey of University students.

Estimated average expenditures by Murray State students appear low based on a previous Murray State study. This could be attributed to a number of factors including the higher cost of fees and other payments made to the University which

are not included in Table 36, plus the general economy provides less employment opportunities for high-paying, part-time jobs than was available a decade ago.

Purchases by Visitors

Expenditures by non-Kentucky visitors to University functions and to University-related personnel have a direct impact on the state economy. University-related purchases by non-Kentucky residents were calculated with the formula:

$$(E_K)_V = (E_V)_{UF} + (E_V)_{UP}$$

where:

$(E_K)_V$ = expenditures by out-of-state visitors to University functions and personnel

$(E_V)_{UF}$ = visits by out-of-state residents to University functions

$(E_V)_{UP}$ = visits by out-of-state residents to University personnel

The estimated expenditures by non-residents of Kentucky visiting University functions and University personnel was:

$$\begin{aligned} (E_K)_V &= \$2,567,366 + \$3,733,623 \\ &= \$6,300,989 \end{aligned}$$

A detailed analysis of nonresident visits to University functions is shown in Table 29. The person-day visits were calculated by multiplying the number of persons attending University functions by the average length of time spent at the

event. The total expenditure by visitors was estimated by multiplying the total person-days for each event by the estimated expenditure per day per visitor.³⁴

The estimated expenditures by non-residents visiting University personnel is shown in Table 30. The person-day for each category of hosts was determined by multiplying the average for that category by the number of University personnel in that category. The total expenditures was calculated in the same manner as that for visitors to University functions.

Taxes Paid by Murray State and Related Personnel

Taxes paid by Murray State and related personnel have a direct impact on the state economy. Taxes paid to the Commonwealth of Kentucky as a result of Murray State University were calculated with the formula:

$$(T_k)_{UES} = (T_k)_U + (T_L)_{IUP} + (T_k)_{PUP}$$

where:

$(T_k)_{UES}$ = taxes paid by Murray State and related personnel

$(T_k)_U$ = taxes paid by the University

$(T_L)_{IUP}$ = state income tax paid by University personnel to local governments in Kentucky

$(T_k)_{PUP}$ = taxes paid by University-related personnel

³⁴ Laura NeGron, Research Director, Tourism, Arts and Heritage Cabinet, Frankfort, Kentucky. Estimated average expenditure per day for tourist in the Kentucky Lake Region during 2015 was \$121.28 and for those spending all day was \$73.35. Given that some of the visitors to University events and personnel travel together and that some of the expenditures by visitors attending University events would be received by the University and some of the cost by visitors to University personnel would be paid by the host, it was believed reasonable to reduce the estimated cost by one-third. This resulted in estimated expenditures for overnight visits at \$80.89, for all day visits at \$48.92, and half day visits at \$24.46.

TABLE 27

ESTIMATED EXPENDITURES BY PERSONS OUTSIDE
KENTUCKY VISITING UNIVERSITY FUNCTIONS

Event/Sponsor	Length of Visit			Estimated Expenditures
	Half Day	Day	Overnight	
Alumni Affairs	10	32	43	\$ 5,288
Athletics	-	4,210	330	232,644
Bauernfeind College of Business	3	7	1	497
Career Service	-	54	8	3,289
CFSB Special Events	3,530	200	9,650	876,655
Cherry Exposition Center	1,075	550	1,850	202,839
College of Education and Human Services	-	15	10	1,543
College of Humanities and Fine Arts	2,111	345	883	139,951
Huston School of Agriculture	410	-	15	11,246
Institute for International Studies	100	17	521	45,417
Jones College of Science, Engineering and Technology	25	45	-	2,813
Lovett Auditorium Special Events	770	485	2,485	243,555
Multicultural Affairs	-	-	410	33,161
MSU Foundation and Miller Golf Course	96	194	571	58,022
Provost Office	9	90	4,008	328,790
Regional Academic Outreach	-	-	1,783	144,209
School of Nursing and Health Professions	20	-	120	10,195
Student Affairs	25	-	1,738	141,181
Student Government Association	1,000	-	-	24,470
Summer Orientation	-	1,041	132	61,602
TOTAL	9,184	7,285	24,558	\$2,567,366

SOURCE: See following pages for list of sources.

Persons Providing Attendance Estimates at University Events

Becky Alexander	Joy Roach Humphreys	Allen Ward
Carol Allen	Jill Hunt	Christy Watkins
Brad Almquist	Carrie Jerrell	Mark Welch
Meghann Anderson	Tim Johns	Kelly Wezmer
Becky Ballard	Michael Kalinski	Velvet Wilson
David Balthrop	Choong -Nam Kang	Janeen Winters
Karen Balzer	Ray Karraker	Chris Wooldridge
Kimberly Bellah	Nita King	Pamela Weirgler
Scott Benson	Steve Lacewell	Tim Zeiss
Tim Black	Misty Brown Lanhem	Gaungrning Zou
Joseph Boldt	Malory Laplant	
Tony Brandon	Tracy Lesie	
Todd Broker	Laura Liljequist	
Robin Brown	Erin Mcgrave	
Carol Brunn	Jarrold Martin	
Chris Bryant	Nancy Mieure	
Richard Burchett	Jeanie Morgan	
Kathy Callahan	Melanie Morgan	
Dave Carr	Sue Ann Morris	
Anita Chitull	Jerry Muuka	
Danny Claiborne	Amanda Park	
Steve Cobb	Sue-Jean Park	
Kim Cothran	Georgia Paschall	
Mike Crook	Victor Raj	
Christian Cruce	Gail Raspberry	
Aaron Dail	Gail Rhodes	
Suzan R. Darnell	Tammie Riggins	
Fred Dietz	Don Robertson	
Stephanie Dodd	Winfield Rose	
Steve Dublin	Melanie McCallon Seib	
Rebecca Dunn	Janice Sims	
Reika Ebert	Zbyneck Smetana	
Warren Edminster	Martha Smith	
John Fammnin	Will Smodgrass	
Deborah Ferguson	Teresa Speed	
Leslie Furches	Melissa Spiceland	
Pam Futrell	Mary Sue Sroda	
Weihong Gas	Benhamin Stinnett	
Mary Ann Gardner	Ron Stinnett	
Nicole Hand-Bryant	Sandra Stone	
Lindsey Harlan	Staci Stone	
Sherry Harpole	Kevin Suicter	
Kelly Herrenbruck	Scott Swalls	
Marcia Hobbs	Jennifer Thorn	
Rhea Ann Holland	Shelly Todd	
Dan Hudson	Jennifer Upton	
John Hughes	Paula Waddill	
Wesley Hughes	Lauren Walker	

TABLE 28

ESTIMATED EXPENDITURES BY PERSONS OUTSIDE
KENTUCKY VISITING UNIVERSITY PERSONNEL

Host/Hostess	Average Visits/Year	Adjusted Hours	Total Visits	Estimated Expenditures
Administrators	16	5	2,010	\$ 98,329
Faculty	30	10	4,480	219,162
Staff	22	15	8,235	402,856
Student	14	6	61,596	3,013,276
Total				\$3,733,623

SOURCE: Calculated from survey data

* It was estimated from survey data that 68 percent of visitors to University Administrators, 67 percent of visitors to University Faculty, 33 percent of visitors to University staff, and 57 percent of visitors to University students were associated with a University function shown in Table 30. Therefore, adjustments were made to avoid double counting. Also the per diem expenditures of \$73.35 were reduced by one-third to \$48.92 to offset estimated goods and services provided by the host or hostess.

The estimated taxes paid by Murray State and related personnel to the state were:

$$\begin{aligned}
 (T_K)_{UES} &= \$4,288 + \$10,210,541 + \$7,954,685 \\
 &= \$18,169,514
 \end{aligned}$$

The estimated taxes paid by Murray State University to the State of Kentucky are shown in Table 31. As a state institution Murray State is exempted from taxes except in cases where the state government agrees for the tax to be paid.

The estimated state income tax paid by households of the administration, faculty, staff, and students is shown in Table 32, and revenue paid to local governments in Kentucky by University-related personnel is shown in Table 33.

Other taxes paid by University employees and students indirectly to the State include, but are not limited to, retail sales taxes, a portion of real estate and personal property tax, gasoline tax, and taxes on some utilities. Given the complexity of the tax code and the difficulty of determining the tax incidence of indirect taxes, it was beyond the scope of this study to break out the taxes separately. However, the total dollar amount would be substantial and is included in the total expenditures attributed to University-related personnel.

TABLE 29
REVENUE PAID TO THE COMMONWEALTH OF
KENTUCKY BY MURRAY STATE UNIVERSITY 2014-2015

Source of Revenue	Total Revenues Paid (in Dollars)	State Tax Paid to The Commonwealth of Kentucky (in Dollars)
Electricity	\$250,535	\$4,088
Natural Gas	65,117	37
Water & Sewer	244	120
Telephone	1,800	43
Total	\$317,696	\$4,288

SOURCE: Source: Ellen Dale, Director of Accounting and Financial Services; Stephanie Jennings, Assistant Director, General Accounting; Jason Royalty, Assistant Director, Reporting.

TABLE 30

ESTIMATED STATE INCOME TAX PAID BY
UNIVERSITY-RELATED PERSONNEL

Source of Revenue	Average Dollar Amount	Total Dollar Amount
Administrators	\$2,879	\$ 1,157,358
Faculty	4,145	1,856,960
Staff	1,963	1,077,687
Student	596	6,118,536
Total		\$10,210,541

SOURCE: Calculated from survey data

TABLE 31
 REVENUE PAID TO LOCAL GOVERNMENTS IN KENTUCKY
 BY UNIVERSITY-RELATED PERSONNEL

Source of Revenue	Administration		Faculty		Staff		Students		Totals
	Average	Total	Average	Total	Average	Total	Average	Total	
Dwelling Tax	\$1,364	\$548,328	\$1,565	\$701,120	\$670	\$367,830	\$381	\$3,911,346	\$5,528,624
Personal Property Tax	497	199,794	365	163,520	479	262,971	122	1,252,452	1,878,737
Miscellaneous Property Tax	183	73,566	253	113,344	376	206,424	15	153,990	547,324
Total		\$821,688		\$977,984		\$837,225		\$5,317,788	
Grand Total									\$7,954,685

SOURCE: Calculated from survey data

Benefits to West Kentucky

The University-related expenditures which directly benefit the economy of West Kentucky were estimated with the formula:

$$(E_{WK})_{UR} = (E_{WK})_U + (E_{WK})_E + (E_{WK})_S + (E_{WK})_V + (T_{WK})_{UES}$$

where:

$(E_{WK})_{UR}$	=	total benefits to West Kentucky from University-related expenditures
$(E_{WK})_U$	=	expenditures in West Kentucky by the University
$(E_{WK})_E$	=	expenditures in West Kentucky by University employees
$(E_{WK})_S$	=	expenditures in West Kentucky by University students
$(E_{WK})_V$	=	expenditures by non-regional visitors to University functions and personnel
$(T_{WK})_{UES}$	=	taxes paid in West Kentucky by the University, University employees and students

The estimated University-related expenditures which directly benefit the economy of West Kentucky were:

$$\begin{aligned}(E_{WK})_{UR} &= \$30,441,217 + \$46,263,769 + \$113,726,748 \\ &+ \$7,744,096 + 5,689,020 \\ &= \$203,864,850\end{aligned}$$

These expenditures are shown in Table 34. The components and derivation of these estimates are shown in the following sections.

TABLE 32

ESTIMATED EXPENDITURES IN WEST KENTUCKY FOR
FY 2015-2016 BY THE UNIVERSITY COMMUNITY

Source of Expenditure	Dollar Amount
University	\$ 30,441,217
University Employees	46,263,769
University Students	113,726,748
Visitors	7,744,096
Taxes	5,689,020
Total	\$203,864,850

Murray State Purchases

Murray State University has a direct impact on the total amount of sales generated in the West Kentucky economy through institutional purchases of goods and services and capital construction outlays. The purchases in West Kentucky by the University were calculated by the formula:

$$(E_{WK})_U = P_{UB} + P_{UF} + P_{UAS} + (C_{WK/6})_U$$

where:

- $(E_{WK})_U$ = expenditures in West Kentucky by the University
- P_{UB} = purchases in West Kentucky through University budget
- P_{UF} = purchases in West Kentucky through University Foundation
- P_{UAS} = purchases in West Kentucky through University Alumni Association
- $(C_{WK/6})_U$ = capital expenditures in West Kentucky for the year using the past six years as a base

Using the above formula, the total purchases of goods and services and capital outlays in Kentucky were estimated at:

$$\begin{aligned}(E_{WK})_U &= \$20,715,027 + \$1,875,202 + \$17,024 + \$7,833,964 \\ &= \$30,441,217\end{aligned}$$

A more detailed account of these purchases is shown in the following sections.

Budget Expenditures

The estimated purchases of goods and services in West Kentucky through the University budget for fiscal year 2014-2015 are shown in Table 35. The categories of expenditures are shown in the first column, the total amount in the second column and the total expenditures in West Kentucky is shown in the third column. The total expenditures for each category was compiled from the University budget. The amount from each category purchased in West Kentucky was estimated by University accountants through an analysis of expense vouchers.

Foundation Expenditures

The estimated purchases of goods and services in West Kentucky through the University Foundation for Fiscal Year 2014-2015 are shown in Table 36. The items purchased are shown in the first column, the total purchases are shown in the second column, and the total purchases made in West Kentucky are shown in the third column.

University Alumni Association Expenditures

The estimated purchases of goods and services in West Kentucky through the University Alumni Association for Fiscal Year 2014-2015 are shown in Table 37. The

categories of expenditures are shown in the first column, the total purchases are shown in the second column, and the total purchases made in West Kentucky are shown in the third column.

TABLE 33

ESTIMATED UNIVERSITY BUDGET EXPENDITURES FOR
GOODS AND SERVICES PURCHASED DURING
FISCAL YEAR 2014-2015

Item	Total Purchases	Total West Kentucky
Service Contracts	\$ 2,786,771	\$ 1,158,396
Electricity	4,415,803	4,397,506
Natural Gas	906,362	906,362
Water/Sewage	577,643	577,643
Other Utilities	171,558	96,794
Telephone/Computer Systems	170,825	1,585
Rentals	500,302	160,870
Operations Maintenance	2,398,881	1,271,110
Postage/Freight	477,341	123,344
Marketing/Publicity/Advertising	922,994	476,332
Insurance (Non-Health & Life)	1,200,021	997,947
Scholarships Paid to Students	13,248,132	-
Other Services	4,303,653	544,049
Operating Supplies	3,097,765	942,105
Inventory Purchases	8,297,848	944,548
Agricultural Supplies	67,699	60,512
Subscriptions/Dues/Awards	1,623,893	206,891
Travel	3,788,395	1,022,791
Capital Outlay	6,655,992	4,171,239
Other Purchases	6,950,880	2,655,003
Total Goods and Services	\$62,562,758	\$20,715,027
Debt Service	\$7,131,609	-
TOTAL	\$69,694,367	\$20,715,027

SOURCE: Ellen Dale, Director of Accounting and Financial Services; Stephanie Jennings, Assistant Director, General Accounting; Jason Royalty, Assistant Director, Reporting.

TABLE 34

ESTIMATED UNIVERSITY FOUNDATION EXPENDITURES FOR
GOODS AND SERVICES PURCHASED DURING
FISCAL YEAR 2014-2015

Item	Total Purchases	Total West Kentucky
Service Contracts	\$ 75,930	\$ 14,493
Electricity	25,157	25,157
Natural Gas	1,229	1,229
Water/Sewage	4,257	4,257
Other Utilities	4,702	58
Telephone/Computer Systems	-	-
Rentals	64,386	3,567
Operations Maintenance	50,100	37,150
Postage/Freight	6,189	3,500
Marketing/Publicity/Advertising	25,269	10,956
Insurance (Non-Health & Life)	50,393	1,249
Scholarships Paid to Students	1,438,093	1,438,093
Other Services	100,697	25,332
Operating Supplies	40,073	18,053
Inventory Purchases	26,453	-
Agricultural Supplies	29,163	1,200
Subscriptions/Dues/Awards	220,297	119,616
Travel	69,389	30,047
Capital Outlay	53,805	-
Other Purchases	400,293	141,245
TOTAL	\$2,685,875	\$1,875,202

SOURCE: Ellen Dale, Director of Accounting and Financial Services and Dr. Robert L. Jackson, President, Murray State Foundation, Inc.

TABLE 35

ESTIMATED UNIVERSITY ALUMNI ASSOCIATION EXPENDITURES FOR
GOODS AND SERVICES PURCHASED DURING
FISCAL YEAR 2014-2015

Item	Total Purchases	Total West Kentucky
Service Contracts	\$ 7,362	\$ 1,528
Rentals	500	300
Marketing/Publicity/Advertising	7,893	7,893
Food Services	6,681	6,681
Other Supplies	1,188	622
TOTAL	\$23,624	\$17,024

SOURCE: Ellen Dale, Director of Accounting and Financial Services.

Capital Construction Expenditures

The estimate for capital construction expenditures for Fiscal Year 2014-15 was based on the average expenditure per year for fiscal years 2009-2010 through 2014-2015. A record of capital construction payments was extracted from University ledgers and analyzed to determine where payments were made. This information was correlated with audited financial statements to verify payments by location. A summary of expenditures for capital construction projects in West Kentucky by Murray State University is shown in Table 38. The estimated annual expenditure in West Kentucky, based on a six-year average, was \$7,833,964.

TABLE 36

EXPENDITURES FOR CAPITAL CONSTRUCTION PROJECTS

Fiscal Year	Total Expenditures	Expenditures West Kentucky
2009-2010	\$12,209,775	\$ 8,961,957
2010-2011	6,123,566	3,933,604
2011-2012	11,911,030	3,296,195
2012-2013	9,965,618	6,681,889
2013-2014	15,921,505	12,318,407
2014-2015	16,549,877	11,811,730
Total	\$72,681,371	\$47,003,782
6 Year Average	\$12,113,562	\$ 7,833,964

SOURCE: Ellen Dale, Director of Accounting and Financial Services; Stephanie Jennings, Assistant Director, General Accounting; Jason Royalty, Assistant Director, Reporting.

Purchases by University Employees

Expenditures for goods and services by Murray State employees have a direct impact on the economy of West Kentucky. The purchases by University employees in West Kentucky were calculated with the formula:

$$(E_{WK})_E = (E_{WK})_A + (E_{WK})_F + (E_{WK})_S$$

where:

- $(E_{WK})_E$ = expenditures in West Kentucky by University employees
- $(E_{WK})_A$ = expenditures in West Kentucky by administrative personnel
- $(E_{WK})_F$ = expenditures in West Kentucky by teaching faculty
- $(E_{WK})_S$ = expenditures in West Kentucky by staff personnel

The estimated expenditures for goods and services in West Kentucky by Murray State employees were:

$$\begin{aligned}(E_{WK})_E &= \$14,691,090 + \$16,256,128 + \$15,316,551 \\ &= \$46,263,769\end{aligned}$$

The estimated expenditures by University administrators in West Kentucky during the 2015-2016 Fiscal Year were \$14,691,090. University administrators were defined, for purposes of this study, as executive, administrative, managerial, and professional non-faculty. There were 402 households representing the 420 employees in this category during the 2014-15 Fiscal Year.³⁵ The estimated purchases of University administrators are shown in Table 39.

The estimated expenditures by University faculty in West Kentucky during the 2015-2016 Fiscal Year were \$16,256,128. University faculty were defined as those persons whose primary duties include teaching and research. There were 448 households representing the 488 University employees in this category during the 2015-2016 Fiscal Year.³⁶ The estimated purchases by University faculty are shown in Table 40.

The estimated expenditures by University staff personnel in West Kentucky during the 2015-16 Fiscal Year were \$15,316,551. University staff personnel included office, clerical, and sales workers; technical and paraprofessional workers. There were 549 households representing the 551 employees in this category during the 2015-

³⁵ Sharon A. Melone, Executive Coordinator, Finance and Haley Stedlin, Manager of Employment and Compensation, Murray State University.

³⁶ Ibid.

2016 Fiscal Year.³⁷ The estimated purchases by University staff personnel are shown in Table 41.

Purchases by University Students

Expenditures for goods and services by University students have a direct impact on the state economy. The estimated expenditures for goods and services in West Kentucky by Murray State students during the 2015-2016 Fiscal Year were \$113,726,748. The estimate was based on a random survey of students enrolled during the academic year. There were 10,998 students enrolled during the 2015 fall semester and 9,754 during the 2016 spring semester, for an average of 10,376 during the academic year.³⁸ The estimates were based on 10,266 student households, after adjusting to account for students married to other students. An itemized list of purchases in West Kentucky by Murray State students is shown in Table 42.

³⁷ Ibid.

³⁸ Jennifer W. Smith, Coordinator of Student Services, Office of Enrollment Management, Murray State University

TABLE 37

ESTIMATED EXPENDITURES OF UNIVERSITY ADMINISTRATORS IN
WEST KENTUCKY DURING FISCAL YEAR 2014-2015

Type of Expenditure	Total Average Expenditure	Total Dollar Amount for Administrators
Rent or House Payment	\$ 8,918	\$ 3,585,036
Homeowners or Renters' Insurance	1,095	440,190
Utilities and Phone	3,727	1,498,254
Maintenance and Other Housing Expenditures	1,140	458,280
Food and Non-Alcoholic Beverages	4,531	1,821,462
Alcoholic Beverages	457	183,714
Tobacco Products	74	29,748
Soap, Cosmetics, and Paper Products	553	222,306
Drugs and Medicine	680	273,360
Other Nondurables (Kitchen Aids, etc.)	361	145,122
Gasoline and Oil	1,700	683,400
Auto Repair and Maintenance	466	187,332
Auto Insurance	1,282	515,364
Non-University Parking	36	14,472
Other Transportation (Train/Plane)	110	44,220
Clothing and Accessories	866	348,132
Doctors, Dentists, and Hospitals	792	318,384
Health and Life Insurance (Non-University)	857	344,514
Instruction Lessons	185	74,370
Rentals	52	20,904
Laundry and Other Services	273	109,746
Appliances and Furniture	516	207,432
Sporting and Recreational Equipment	161	64,722
Automobiles and Trucks	2,698	1,084,596
Recreation	470	188,940
Hobbies	211	84,822
Entertainment	770	309,540
Charities	2,800	1,125,600
Gifts	764	307,128
Total	\$36,545	\$14,691,090

Source: Calculated from data attained through survey of University faculty and staff.

TABLE 38

ESTIMATED EXPENDITURES OF UNIVERSITY FACULTY IN
WEST KENTUCKY DURING FISCAL YEAR 2014-2015

Type of Expenditure	Total Average Expenditure	Total Dollar Amount for Faculty
Rent or House Payment	\$ 7,929	\$ 3,552,192
Homeowners or Renters' Insurance	2,115	947,520
Utilities and Phone	3,646	1,633,408
Maintenance and Other Housing Expenditures	1,566	701,568
Food and Non-Alcoholic Beverages	4,963	2,223,424
Alcoholic Beverages	476	213,248
Tobacco Products	14	6,272
Soap, Cosmetics, and Paper Products	597	267,456
Drugs and Medicine	573	256,704
Other Nondurables (Kitchen Aids, etc.)	433	193,984
Gasoline and Oil	1,696	759,808
Auto Repair and Maintenance	616	275,968
Auto Insurance	1,000	448,000
Non-University Parking	13	5,824
Other Transportation (Train/Plane)	129	57,792
Clothing and Accessories	929	416,192
Doctors, Dentists, and Hospitals	986	441,728
Health and Life Insurance (Non-University)	556	249,088
Instruction Lessons	465	208,320
Rentals	88	39,424
Laundry and Other Services	164	73,472
Appliance and Furnitures	528	236,544
Sporting and Recreational Equipment	51	22,848
Automobiles and Trucks	1,348	603,904
Recreation	419	187,712
Hobbies	104	46,592
Entertainment	755	338,240
Charities	3,597	1,611,456
Gifts	530	237,440
Total	\$36,286	\$16,256,128

Source: Calculated from data attained through survey of University faculty and staff.

TABLE 39

ESTIMATED EXPENDITURES OF UNIVERSITY STAFF IN
WEST KENTUCKY DURING FISCAL YEAR 2014-2015

Type of Expenditure	Total Average Expenditure	Total Dollar Amount for Staff
Rent or House Payment	\$ 4,778	\$ 2,623,122
Homeowners or Renters' Insurance	1,283	704,367
Utilities and Phone	3,049	1,673,901
Maintenance and Other Housing Expenditures	1,067	585,783
Food and Non-Alcoholic Beverages	4,350	2,388,150
Alcoholic Beverages	332	182,268
Tobacco Products	218	119,682
Soap, Cosmetics, and Paper Products	602	330,498
Drugs and Medicine	497	272,853
Other Nondurables (Kitchen Aids, etc.)	436	239,364
Gasoline and Oil	1,806	991,494
Auto Repair and Maintenance	367	201,483
Auto Insurance	1,315	721,935
Non-University Parking	12	6,588
Other Transportation (Train/Plane)	-	-
Clothing and Accessories	677	371,673
Doctors, Dentists, and Hospitals	522	286,578
Health and Life Insurance (Non-University)	641	351,909
Instruction Lessons	118	64,782
Rentals	339	186,111
Laundry and Other Services	86	47,214
Appliance and Furnitures	303	166,347
Sporting and Recreational Equipment	107	58,743
Automobiles and Trucks	2,663	1,461,987
Recreation	201	110,349
Hobbies	71	38,979
Entertainment	489	268,461
Charities	675	370,575
Gifts	895	491,355
Total	\$27,899	\$15,316,551

Source: Calculated from data attained through survey of University faculty and staff.

TABLE 40

ESTIMATED EXPENDITURES OF UNIVERSITY STUDENTS IN
WEST KENTUCKY DURING FISCAL YEAR 2014-2015

Type of Expenditure	Total Average Expenditure	Total Dollar Amount for Students
Rent or House Payment	\$ 3,433	\$ 35,243,178
Homeowners or Renters' Insurance	239	2,453,574
Utilities and Phone	927	9,516,582
Maintenance and Other Housing	336	3,449,376
Food and Non-Alcoholic Beverages	1,218	12,503,988
Alcoholic Beverages	216	2,217,456
Tobacco Products	53	544,098
Dining Out	454	4,660,764
Fast Food	326	3,346,716
Soap, Cosmetics, and Paper Products	210	2,155,860
Drugs and Medicine	120	1,231,920
Other Nondurables	131	1,344,846
Gasoline and Oil	561	5,759,226
Auto Repair and Maintenance	107	1,098,462
Auto Insurance	525	5,389,650
Other Transportation Expenses	45	461,970
Clothing and Accessories	300	3,079,800
Doctors and Dentists	125	1,283,250
Health and Life Insurance	193	1,981,338
Instruction Lessons	69	708,354
Rentals	32	328,512
Laundry and Other Services	44	451,704
Appliance and Furniture	136	1,396,176
Sporting and Recreational Equipment	56	574,896
Automobiles and Trucks	360	3,695,760
Recreation	80	821,280
Hobbies	104	1,067,664
Entertainment	338	3,469,908
Charities	158	1,622,028
Gifts	182	1,868,412
Total	\$11,078	\$113,726,748

Source: Calculated from data attained through survey of University students.

Purchases by Visitors

Expenditures by non-West Kentucky visitors to University functions and to University-related personnel have a direct impact on the West Kentucky economy. University-related purchases by non-West Kentucky residents were calculated with the formula:

$$(E_{WK})_V = (E_V)_{UF} + (E_V)_{UP}$$

where:

$(E_{WK})_V$ = expenditures by non-regional residents visiting University functions and personnel

$(E_V)_{UF}$ = expenditures by non-regional residents attending University functions.

$(E_V)_{UP}$ = expenditures by non-regional residents visiting University personnel.

The estimated expenditures by non-West Kentucky residents attending University functions and visiting University-related personnel were:

$$\begin{aligned}(E_{WK})_V &= \$3,391,048 + \$4,353,048 \\ &= \$7,744,096\end{aligned}$$

A detailed analysis of nonresident visits to University functions is shown in Table 43. The person-day visits were calculated by multiplying the number of persons attending University functions by the average length of time spent at the event. The total expenditure by visitors was estimated by multiplying the total person-days for each event by estimated expenditure per day per visitor. ³⁹

³⁹ Laura NeGron, Research Director, Tourism, Arts and Heritage Cabinet, Frankfort, Kentucky. Estimated average expenditure per day for tourist in the Kentucky Lake Region during 2015

The estimated expenditure by non-regional persons visiting University personnel is shown in Table 44. The person-day visits were calculated by multiplying the average number of visitors by the average length of visits for each category of hosts. The total person-day visits for each category of hosts was determined by multiplying the average for that category by the number of University households in that category. The total expenditures was calculated in the same manner as that for visitors to University functions.

was \$121.28, and for those spending all day was \$73.35. Given that some of the visitors to University events and personnel travel together and that some of the expenditures by visitors attending University events would be received by the University and some of the cost by visitors to University personnel would be paid by the host, it was believed reasonable to reduce the estimated cost by one-third. This resulted in estimated expenditures for overnight visits at \$80.89, for all day visits at \$48.92, and half-day visits at \$24.46.

TABLE 41

ESTIMATED EXPENDITURES BY PERSONS OUTSIDE WEST
KENTUCKY VISITING UNIVERSITY FUNCTIONS

Event/Sponsor	Length of Visit			Estimated Expenditures
	Half Day	Day	Overnight	
Alumni Affairs	10	34	53	\$ 6,195
Athletics	3,825	5,040	335	367,249
Bauernfeind College of Business	11	12	18	2,312
Career Service	-	202	12	10,852
CFSB Special Events	3,640	755	10,975	1,013,663
Cherry Exposition Center	3,775	925	2,275	321,627
College of Education and Human Services	8	15	30	3,356
College of Humanities and Fine Arts	4,598	1,315	877	247,775
Huston School of Agriculture	540	106	95	26,083
Institute for International Studies	104	57	545	49,413
Jones College of Science, Engineering and Technology	25	45	-	2,813
Lovett Auditorium Special Events	1,000	1,345	2,745	312,283
Multicultural Affairs	-	-	515	41,653
MSU Foundation and Miller Golf Course	116	292	821	83,526
Provost Office	14	66	4,008	357,090
Regional Academic Outreach	8	2	1,933	156,635
School of Nursing and Health Professions	130	-	120	12,887
Student Affairs	25	-	2,767	224,407
Student Government Association	2,100	-	-	51,387
Summer Orientation	-	1,659	231	99,842
TOTAL	19,929	11,870	28,355	\$3,391,047

SOURCE: See page 59.

TABLE 42

ESTIMATED EXPENDITURES BY PERSONS OUTSIDE
WEST KENTUCKY VISITING UNIVERSITY PERSONNEL

Host/Hostess	Average Visits/Year	Adjusted Hours	Total Visits	Estimated Expenditures
Administrators	20	6	2,412	\$ 117,995
Faculty	35	12	5,376	262,994
Staff	25	17	9,333	456,570
Student	17	7	71,862	3,515,489
				\$4,353,048

SOURCE: Calculated from survey data

* It was estimated from survey data that 68 percent of visitors to University Administrators, 67 percent of visitors to University Staff, and 57 percent of visitors to University students were associated with a University function shown in Table 43 and were adjusted to avoid double counting. Also the per diem of \$73.35 was reduced by one-third to \$43.92 to offset estimated goods and services provided by the host or hostess.

Taxes Paid by Murray State and Related Personnel

Taxes paid by Murray State University and related personnel to city and county governments have a direct impact on the regional economy. Taxes paid to local governments as a result of Murray State being located in West Kentucky were calculated with the formula:

$$(T_{WK})_{UES} = (T_{WK})_U + (T_{WK})_{UP}$$

where:

$(T_{WK})_{UES}$ = taxes paid in West Kentucky by the University, University employees and students

$(T_{WK})_U$ = local taxes paid by the University

$(T_{WK})_{UP}$ = local taxes paid by University-related personnel

The estimated taxes paid by Murray State and related personnel to city and county governments in West Kentucky were:

$$\begin{aligned}(T_{WK})_{UES} &= \$161,922 + \$5,527,098 \\ &= \$5,689,020\end{aligned}$$

The estimated local taxes paid by Murray State in West Kentucky are shown in Table 45. As a state institution, Murray State is exempted from local taxes except in cases where the state government agrees for the tax to be paid. The estimated taxes paid by members of the administration, faculty, staff, and student body of Murray State to city and county governments in West Kentucky are shown in Table 46. These taxes include local property taxes on dwellings, autos and other property. Other local taxes paid by University employees and students in some areas include payroll taxes, city auto tags, and indirect taxes on insurance policies and utilities. These are not shown separately but are included in local government budgets and indirect taxes on insurance and utilities are counted in the expenditures for those items.

TABLE 43

REVENUE PAID TO LOCAL GOVERNMENTS IN WEST
KENTUCKY BY MURRAY STATE UNIVERSITY 2014-2015

Source of Revenue	Total Revenues Paid (in Dollars)	School Tax Paid to Local Governments in West Kentucky (in Dollars)
Electricity	\$250,535	\$127,541
Natural Gas	65,117	33,369
Water & Sewer	244	124
Telephone	1,800	888
Total	\$317,696	\$161,922

SOURCE: Ellen Dale, Director of Accounting and Financial Services; Stephanie Jennings, Assistant Director, General Accounting; Jason Royalty, Assistant Director, Reporting.

TABLE 44
REVENUE PAID TO LOCAL GOVERNMENTS IN WEST KENTUCKY
BY UNIVERSITY-RELATED PERSONNEL

Source of Revenue	<u>Administration</u>		<u>Faculty</u>		<u>Staff</u>		<u>Students</u>		<u>Totals</u>
	Average	Total	Average	Total	Average	Total	Average	Total	
Dwelling Tax	\$1,269	\$510,138	\$1,468	\$657,664	\$670	\$367,830	\$238	\$2,443,308	\$3,978,940
Personal Property Tax	445	178,890	356	159,488	466	255,834	60	615,960	1,210,172
Miscellaneous Property Tax	127	51,054	234	104,832	126	69,174	11	112,926	337,986
<u>Total</u>		<u>\$740,082</u>		<u>\$921,984</u>		<u>\$692,838</u>		<u>\$3,172,194</u>	
<u>Grand Total</u>									<u>\$5,527,098</u>

SOURCE: Calculated from survey data

Benefits to Murray and Calloway County

Local expenditures related to Murray State University result in monetary injections which are beneficial to the economy of Murray and Calloway County. Murray State-related local expenditures include those by the University, University-related personnel, visitors, and local taxes paid by the University and University-related personnel. These direct injections also foster secondary benefits as the dollars are re-spent throughout the local area.

The University-related local expenditures which directly benefit the local economy were estimated with the formula:

$$(E_L)_{UR} = (E_L)_U + (E_L)_E + (E_L)_S + (E_L)_V + (T_L)_{UES}$$

where:

$(E_L)_{UR}$	=	University-related local expenditures
$(E_L)_U$	=	local expenditures by the University
$(E_L)_E$	=	local expenditures by University employees
$(E_L)_S$	=	local expenditures by University students
$(E_L)_V$	=	local expenditures by visitors to the University and University personnel
$(T_L)_{UES}$	=	local taxes paid by the University, University employees and students

The University-related local expenditures which directly benefit the local economy were:

$$\begin{aligned}
(E_L)_{UR} &= \$14,846,541 + \$40,279,294 + \$86,142,006 \\
&+ \$13,204,938 + \$4,332,485 \\
&= \$158,805,264
\end{aligned}$$

These expenditures are shown in Table 47. The components and derivation of these estimates are shown in the following sections.

TABLE 45
ESTIMATED LOCAL EXPENDITURES FOR FY 2015-2016
BY THE UNIVERSITY COMMUNITY

Source of Expenditures	Dollar Amount
University	\$ 14,846,541
University Employees	40,279,294
University Students	86,142,006
Visitors	13,204,938
Taxes	4,332,485
Total	\$158,805,264

Murray State Purchases

Murray State University has a direct impact on the total amount of sales generated in the local economy through institutional purchases of goods and services and capital construction outlays. The local purchases by the University were calculated by the formula:

$$(E_L)_{UR} = P_{UB} + P_{UF} + P_{UAS} + (C_{L/6})_U$$

where:

$$(E_L)_{UR} = \text{University-related local expenditures}$$

P_{UB}	=	local purchases through University budget
P_{UF}	=	local purchases through University Foundation
P_{UAS}	=	local purchases through University Alumni Association
$(C_{L/6})_U$	=	local capital expenditures for the year using past six years as base

Using the above formula, the total local purchases of goods and services and capital outlays are estimated at:

$$\begin{aligned} (E_L)_U &= \$11,703,303 + \$1,760,232 + \$16,158 + \$1,366,847 \\ &= \$14,846,540 \end{aligned}$$

A more detailed account of these purchases is shown in the following sections.

Budget Expenditures

The estimated local purchases of goods and services through the University budget for Fiscal Year 2014-2015 are shown in Table 48. The categories of expenditures are shown in the first column, the total amount in the second column and the total expenditures are shown in the third column. The total expenditures for each category were compiled from the University budget. The amount from each category purchased locally was estimated by University accountants through an analysis of expense vouchers.

Foundation Expenditures

The estimated local purchases of goods and services by the University Foundation for Fiscal Year 2014-2015 are shown in Table 49. The items purchased are shown in the first column, the total purchases are shown in the second column,

and the total local purchases are shown in the third column. The amount purchased locally was estimated by University accountants through an analysis of expense vouchers.

TABLE 46

ESTIMATED UNIVERSITY BUDGET EXPENDITURES FOR
GOODS AND SERVICES PURCHASED DURING
FISCAL YEAR 2014-2015

Item	Total Purchases	Total Calloway County
Service Contracts	\$ 2,786,771	\$ 852,693
Electricity	4,415,803	4,024,683
Natural Gas	906,362	906,362
Water/Sewage	577,643	566,612
Other Utilities	171,558	57,708
Telephone/Computer Systems	170,825	1,085
Rentals	500,302	104,688
Operations Maintenance	2,398,881	532,004
Postage/Freight	477,341	110,032
Marketing/Publicity/Advertising	922,994	309,813
Insurance (Non-Health/Life)	1,200,021	-
Scholarships Paid to Students	13,248,132	-
Other Services	4,303,653	357,973
Operating Supplies	3,097,765	763,299
Inventory Purchases	8,297,848	207,683
Agricultural Supplies	67,699	48,486
Subscriptions/Dues/Awards	1,623,893	133,978
Travel	3,788,395	873,400
Capital Outlay	6,655,992	256,476
Other Purchases	6,950,880	1,596,328
Total Goods and Services	62,562,758	11,703,303
Debt Service	7,131,609	-
TOTAL	\$69,694,367	\$11,703,303

SOURCE: Ellen Dale, Director of Accounting and Financial Services; Stephanie Jennings, Assistant Director, General Accounting; Jason Royalty, Assistant Director, Reporting.

TABLE 47

ESTIMATED UNIVERSITY FOUNDATION EXPENDITURES FOR
GOODS AND SERVICES PURCHASED DURING
FISCAL YEAR 2014-2015

Item	Total Purchases	Total Calloway County
Service Contracts	\$ 75,930	\$ 8,020
Electricity	25,157	7,413
Natural Gas	1,229	-
Water/Sewage	4,257	4,257
Other Utilities	4,702	-
Telephone/Computer Systems	-	-
Rentals	64,386	1,568
Operations Maintenance	50,100	33,809
Postage/Freight	6,189	258
Marketing/Publicity/Advertising	25,269	8,994
Insurance (Non-Health/Life)	50,393	669
Scholarships Paid to Students	1,438,093	1,438,093
Other Services	100,697	1,199
Operating Supplies	40,073	12,175
Inventory Purchases	26,453	-
Agricultural Supplies	29,163	1,200
Subscriptions/Dues/Awards	220,297	116,193
Travel	69,389	29,312
Capital Outlay	53,805	-
Other Purchases	400,293	97,073
Total Goods and Services	\$2,685,875	\$1,760,233
TOTAL	\$2,685,875	\$1,760,233

SOURCE: Ellen Dale, Director of Accounting and Financial Services and Dr. Robert L. Jackson, President, Murray State Foundation, Inc.

University Alumni Association Expenditures

The estimated local purchases of goods and services through the University Alumni Association for Fiscal Year 2014-2015 are shown in Table 50. The categories of expenditures are shown in the first column, the total purchases are shown in the second column, and the total local purchases are shown in the third column.

TABLE 48

ESTIMATED UNIVERSITY ALUMNI ASSOCIATION EXPENDITURES FOR
GOODS AND SERVICES PURCHASED DURING
FISCAL YEAR 2014-2015

Item	Total Purchases	Total Calloway County
Service Contracts	\$ 7,362	\$ 1,528
Rentals	500	-
Marketing/Publicity/Advertising	7,893	7,327
Food Services	6,681	6,681
Other Supplies	1,188	622
TOTAL	\$23,624	\$16,158

SOURCE: Ellen Dale, Director of Accounting and Financial Services; Stephanie Jennings, Assistant Director, General Accounting; Jason Royalty, Assistant Director, Reporting

Capital Construction Expenditures

The estimate for capital construction expenditures for Fiscal Year 2014-2015 was based on the average expenditure per year for fiscal years 2010-2015. A record of capital construction payments was extracted from University ledgers and analyzed to determine where payments were made. This information was correlated with audited financial statements to verify payments by location. A summary of the local expenditures for capital construction projects by Murray State is shown in Table 51. The estimated annual expenditure, based on a six-year average, was \$1,366,847.

TABLE 49

EXPENDITURES FOR CAPITAL CONSTRUCTION PROJECTS

Fiscal Year	Total Expenditures	Expenditures Calloway County
2009-2010	\$12,209,775	\$1,676,430
2010-2011	6,123,566	2,270,947
2011-2012	11,911,030	931,337
2012-2013	9,965,618	417,629
2013-2014	15,921,505	1,454,865
2014-2015	16,549,877	1,449,873
Total	\$72,681,371	\$8,201,081
Six Year Average	\$12,113,562	\$1,366,847

SOURCE: Ellen Dale, Director of Accounting and Financial Services; Stephanie Jennings, Assistant Director, General Accounting; Jason Royalty, Assistant Director, Reporting.

Purchases by University Employees

Expenditures for goods and services by Murray State employees have a direct impact on the local economy. The local purchases by University employees were calculated with the formula:

$$(E_L)_E = (E_L)_A + (E_L)_{TF} + (E_L)_S$$

where:

$(E_L)_E$ = local expenditures by University employees

$(E_L)_A$ = local expenditures by administrative personnel

$(E_L)_{TF}$ = local expenditures by teaching faculty

$(E_L)_S$ = local expenditures by staff

The estimated local expenditures for goods and services by Murray State employees were:

$$\begin{aligned} (E_L)_E &= \$11,865,432 + \$14,580,160 + \$13,833,702 \\ &= \$40,279,294 \end{aligned}$$

The estimated local expenditures by University administrators for Fiscal Year 2015-2016 are shown in Table 52. University administrators were defined, for purposes of this study, as executive, administrative, managerial, and professional non-faculty. There were 402 households representing 420 employees in this category during the 2015-2016 Fiscal Year.⁴⁰ The total local expenditures for University administrators was an estimated \$11,865,432.

⁴⁰ Sharon A. Melone, Executive Coordinator, Finance, and Haley Stedelan, Manager of Employment and Compensation, Murray State University.

TABLE 50

ESTIMATED EXPENDITURES OF UNIVERSITY ADMINISTRATORS IN
CALLOWAY COUNTY DURING FISCAL YEAR 2014-2015

Type of Expenditure	Total Average Expenditure	Total Dollar Amount for Administrators
Rent or House Payment	\$ 7,798	\$ 3,134,796
Homeowners or Renters' Insurance	923	371,046
Utilities and Phone	3,073	1,235,346
Maintenance and Other Housing Expenditures	1,039	417,678
Food and Non-Alcoholic Beverages	4,095	1,646,190
Alcoholic Beverages	448	180,096
Tobacco Products	74	29,748
Soap, Cosmetics, and Paper Products	553	222,306
Drugs and Medicine	487	195,774
Other Nondurables (Kitchen Aids, etc.)	319	128,238
Gasoline and Oil	1,378	553,956
Auto Repair and Maintenance	324	130,248
Auto Insurance	996	400,392
Non-University Parking	36	14,472
Other Transportation (Train/Plane)	-	-
Clothing and Accessories	634	254,868
Doctors, Dentists, and Hospitals	584	234,768
Health and Life Insurance (Non-University)	625	251,250
Instruction Lessons	166	66,732
Rentals	52	20,904
Laundry and Other Services	273	109,746
Appliance and Furnitures	345	138,690
Sporting and Recreational Equipment	94	37,788
Automobiles and Trucks	1,603	644,406
Recreation	225	90,450
Hobbies	180	72,360
Entertainment	770	309,540
Charities	1,894	761,388
Gifts	528	212,256
Total	\$29,516	\$11,865,432

Source: Calculated from data attained through survey of University faculty and staff.

The estimated local expenditures by University faculty during the 2015-2016 Fiscal Year were \$14,580,160. University faculty was defined as those persons whose primary duties include teaching and research. There were 448 households representing the 488 University employees in this category during the 2015-2016 Fiscal Year.⁴¹ The estimated purchases by University faculty is shown in Table 53.

The estimated local expenditures by University staff personnel during the 2015-2016 Fiscal Year were \$13,833,702. University staff personnel included office, clerical and sales workers; technical and paraprofessional workers; skilled crafts workers; and service/maintenance workers. There were 449 households representing the 551 employees in this category during the 2015-2016 Fiscal Year.⁴² The estimated purchases by University staff is shown in Table 54.

Purchases by University Students

Expenditures for goods and services by University students have a direct impact on the local economy. The estimated expenditures for goods and services in Murray/Calloway County by Murray State students during the 2015-2016 Fiscal Year was \$86,142,006. The estimate was based on a random survey of students enrolled during the academic year. There were 10,998 students enrolled during the 2015 fall semester and 9,754 during the 2016 spring semester for an average of 10,376 during the academic year.⁴³ The estimates were based on 10,266 student households, after adjusting to account for students married to other students. An itemized list of local purchases by Murray State students is shown in Table 55.

⁴¹ Ibid.

⁴² Ibid.

⁴³ Jennifer W. Smith, Coordinator of Student Services, Office of Enrollment Management. Murray State University.

TABLE 51

ESTIMATED EXPENDITURES OF UNIVERSITY FACULTY IN
CALLOWAY COUNTY DURING FISCAL YEAR 2014-2015

Type of Expenditure	Total Average Expenditure	Total Dollar Amount for Faculty
Rent or House Payment	\$ 7,626	\$ 3,416,448
Homeowners or Renters' Insurance	1,657	742,336
Utilities and Phone	3,065	1,373,120
Maintenance and Other Housing Expenditures	1,371	614,208
Food and Non-Alcoholic Beverages	4,592	2,057,216
Alcoholic Beverages	468	209,664
Tobacco Products	14	6,272
Soap, Cosmetics, and Paper Products	465	208,320
Drugs and Medicine	547	245,056
Other Nondurables (Kitchen Aids, etc.)	360	161,280
Gasoline and Oil	1,317	590,016
Auto Repair and Maintenance	582	260,736
Auto Insurance	934	418,432
Non-University Parking	7	3,136
Other Transportation (Train/Plane)	116	51,968
Clothing and Accessories	786	352,128
Doctors, Dentists, and Hospitals	986	441,728
Health and Life Insurance (Non-University)	556	249,088
Instruction Lessons	465	208,320
Rentals	88	39,424
Laundry and Other Services	156	69,888
Appliance and Furnitures	418	187,264
Sporting and Recreational Equipment	38	17,024
Automobiles and Trucks	1,160	519,680
Recreation	384	172,032
Hobbies	89	39,872
Entertainment	579	259,392
Charities	3,306	1,481,088
Gifts	413	185,024
Total	\$32,545	\$14,580,160

Source: Calculated from data attained through survey of University faculty and staff.

TABLE 52

ESTIMATED EXPENDITURES OF UNIVERSITY STAFF IN
CALLOWAY COUNTY DURING FISCAL YEAR 2014-2015

Type of Expenditure	Total Average Expenditure	Total Dollar Amount for Staff
Rent or House Payment	\$ 4,630	\$ 2,541,870
Homeowners or Renters' Insurance	1,199	658,251
Utilities and Phone	2,625	1,441,125
Maintenance and Other Housing	1,010	554,490
Food and Non-Alcoholic Beverages	4,005	2,198,745
Alcoholic Beverages	275	150,975
Tobacco Products	218	119,682
Soap, Cosmetics, and Paper Products	513	281,637
Drugs and Medicine	497	272,853
Other Nondurables (Kitchen Aids, etc.)	375	205,875
Gasoline and Oil	1,640	900,360
Auto Repair and Maintenance	312	171,288
Auto Insurance	1,172	643,428
Non-University Parking	9	4,941
Other Transportation (Train/Plane)	-	-
Clothing and Accessories	603	331,047
Doctors, Dentists, and Hospitals	519	284,931
Health and Life Insurance (Non-University)	449	246,501
Instruction Lessons	46	25,254
Rentals	327	179,523
Laundry and Other Services	86	47,214
Appliances and Furniture	276	151,524
Sporting and Recreational Equipment	73	40,077
Automobiles and Trucks	2,535	1,391,715
Recreation	146	80,154
Hobbies	54	29,646
Entertainment	466	255,834
Charities	481	264,069
Gifts	657	360,693
Total	\$25,198	\$13,833,702

Source: Calculated from data attained through survey of University faculty and staff.

TABLE 53

ESTIMATED EXPENDITURES OF UNIVERSITY STUDENTS IN
CALLOWAY COUNTY DURING FISCAL YEAR 2014-2015

Type of Expenditure	Total Average Expenditure	Total Dollar Amount for Students
Rent or House Payment	\$2,967	\$30,459,222
Homeowners or Renters' Insurance	152	1,560,432
Utilities and Phone	628	6,447,048
Maintenance and Other Housing	244	2,504,904
Food and Non-Alcoholic Beverages	964	9,896,424
Alcoholic Beverages	193	1,981,338
Tobacco Products	42	431,172
Dining Out	355	3,644,430
Fast Food	278	2,853,948
Soap, Cosmetics, and Paper Products	174	1,786,284
Drugs and Medicine	100	1,026,600
Other Nondurables	106	1,088,196
Gasoline and Oil	429	4,404,114
Auto Repair and Maintenance	67	687,822
Auto Insurance	316	3,244,056
Other Transportation Expenses	45	461,970
Clothing and Accessories	205	2,104,530
Doctors and Dentists	59	605,694
Health and Life Insurance	92	944,472
Instruction Lessons	45	461,970
Rentals	31	318,246
Laundry and Other Services	40	410,640
Appliance and Furniture	98	1,006,068
Sporting and Recreational Equipment	39	400,374
Automobiles and Trucks	178	1,827,348
Recreation	55	564,630
Hobbies	72	739,152
Entertainment	259	2,658,894
Charities	75	769,950
Gifts	83	852,078
Total	\$8,391	\$86,142,006

Source: Calculated from data attained through survey of University students.

Purchases By Visitors

Expenditures by non-Calloway County residents visiting University functions and University-related personnel have a direct impact on the local economy. The local University-related purchases by non-Calloway County residents were calculated with the formula:

$$(E_L)_V = (E_V)_{UF} + (E_V)_{UP}$$

where:

$(E_L)_V$ = local expenditures by visitors to the University and University personnel

$(E_V)_{UF}$ = visits by non-local residents to University functions

$(E_V)_{UP}$ = visits by non-local residents to University personnel

The estimated local expenditures by non-residents visiting University functions and University personnel were:

$$\begin{aligned}(E_L)_V &= \$5,830,395 + \$7,374,543 \\ &= \$13,204,938\end{aligned}$$

A detailed analysis of nonlocal resident visits to University functions is shown in Table 56. The average person-day visits were calculated by multiplying the number of persons attending University functions by the average length of time spent in

Calloway County. The total expenditure by visitors was estimated by multiplying the total person-days for each event by the estimated expenditure per day per visitor.⁴⁴

⁴⁴ Laura NeGron, Research Director, Tourism, Arts and Heritage Cabinet, Frankfort, Kentucky. Estimated average expenditure per day for tourists in the Kentucky Lake Region during 2015 was \$121.28 and for those spending all day was \$73.35. Given that some of the visitors to University events and personnel travel together and that some of the expenditures by visitors attending University events would be received by the University and some of the cost by visitors to University personnel would be paid by the host it was believed reasonable to reduce the estimated cost by one-third. This resulted in estimated expenditures for overnight visits at \$80.89, for all-day visits at \$48.92, and half-day visits at \$24.46.

TABLE 54

ESTIMATED EXPENDITURES BY PERSONS OUTSIDE CALLOWAY
COUNTY VISITING UNIVERSITY FUNCTION

Event/Sponsor	Length of Visit			Estimated Expenditures
	Half Day	Day	Overnight	
Alumni Affairs	17	53	59	\$ 7,781
Athletics	16,526	6,937	335	770,844
Bauernfeind College of Business	51	1,040	18	53,581
Career Service	-	274	12	14,375
CFSB Special Events	14,273	1,450	16,625	1,764,824
Cherry Exposition Center	16,575	1,475	2,725	698,145
College of Education and Human Services	153	133	890	82,233
College of Humanities and Fine Arts	9,722	2,142	877	413,616
Huston School of Agriculture	1,830	1,117	95	107,107
Institute for International Studies	765	74	555	67,228
Jones College of Science, Engineering and Technology	50	45	-	3,425
Lovett Auditorium Special Events	1,375	3,900	2,745	446,450
Multicultural Affairs	-	-	800	64,704
MSU Foundation and Miller Golf Course	239	392	871	95,471
Provost Office	2,035	4,192	4,008	579,036
Regional Academic Outreach	26	13	2,287	186,245
School of Nursing and Health Professions	140	-	120	13,131
Student Affairs	25	26	3,117	253,987
Student Government Association	2,600	-	-	63,622
Summer Orientation	-	2,539	252	144,590
TOTAL	66,402	25,802	36,391	\$5,830,395

SOURCE: See page 59.

The estimated expenditures by nonlocal persons visiting University personnel is shown in Table 57. The average person-day visits were calculated by multiplying the average number of visitors by the average length of visits for each category of hosts. The total person-day visits for each category of hosts was determined by multiplying the average for the category by the number of local University-related personnel in that category. The total expenditure was calculated in the same manner as that for the visitors to University functions.

TABLE 55

ESTIMATED EXPENDITURES BY PERSONS OUTSIDE
CALLOWAY COUNTY VISITING UNIVERSITY PERSONNEL

Host/Hostess	Average Visits/Year	Adjusted Average	Total Visits	Estimated Expenditures
Administrators	34	11	4,422	\$ 216,324
Faculty	64	21	9,408	460,239
Staff	38	25	13,725	671,427
Student	28	12	123,192	6,026,553
Total				\$7,374,543

SOURCE: Calculated from survey data

* It was estimated from survey data that 68 percent of visitors to University Administrators, 67 percent of visitors to University Staff, and 57 percent of visitors to University students were associated with a University function shown in Table 30 and were adjusted to avoid double counting. Also per diem expenditures of \$73.35 were reduced by one-third to offset estimated goods and services provided by the host or hostess.

Taxes Paid by Murray State and Related Personnel

Local taxes paid by Murray State and related personnel have a direct impact on the local economy. Local taxes paid as a result of Murray State being located in Calloway County were calculated with the formula:

$$(T_L)_{UES} = (T_L)_U + (T_L)_{UP}$$

where:

$(T_L)_{UES}$ = local taxes paid by the University, University employees and students

$(T_L)_U$ = local taxes paid by the University

$(T_L)_{UP}$ = local taxes paid by University-related personnel

The estimated local taxes paid by Murray State and related personnel were:

$$\begin{aligned}(T_L)_{UES} &= \$151,486 + \$4,180,999 \\ &= \$4,332,485\end{aligned}$$

The estimated local taxes paid by Murray State are shown in Table 58. As a state institution Murray State is exempted from local taxes except in cases where the state government agrees for the tax to be paid. The estimated local taxes paid by members of the administration, faculty, staff, and student body of Murray State are shown in Table 59. These taxes included local property taxes on dwellings, autos, and other property. Other local taxes paid by University employees and students include indirect taxes on insurance and utilities. These are not shown separately but are included in expenditures on those items.

TABLE 56

REVENUE PAID TO LOCAL GOVERNMENTS IN CALLOWAY COUNTY
BY MURRAY STATE UNIVERSITY 2014-2015

Source of Revenue	Total Revenues Paid (in Dollars)	School Tax Paid to Local Governments in Calloway County (in Dollars)
Electricity	\$250,535	\$118,906
Natural Gas	65,117	31,711
Water & Sewer	244	-
Telephone	1,800	869
Total	\$317,696	\$151,486

SOURCE: Ellen Dale, Director of Accounting and Financial Services; Stephanie Jennings, Assistant Director, General Accounting; Jason Royalty, Assistant Director, Reporting.

TABLE 57
 REVENUE PAID TO LOCAL GOVERNMENTS IN CALLOWAY COUNTY
 BY UNIVERSITY-RELATED PERSONNEL

Source of Revenue	<u>Administration</u>		<u>Faculty</u>		<u>Staff</u>		<u>Students</u>		<u>Totals</u>
	Average	Total	Average	Total	Average	Total	Average	Total	
Dwelling Tax	\$1,110	\$446,220	\$1,417	\$634,816	\$477	\$261,873	\$181	\$1,858,146	\$3,201,055
Personal Property Tax	266	106,932	310	138,880	337	185,013	29	297,714	728,539
Miscellaneous Property Tax	112	45,024	170	76,160	125	68,625	6	61,596	251,504
Total		\$598,176		\$849,856		\$515,511		\$2,217,456	
Grand Total									\$4,180,999

SOURCE: Calculated from survey data

CHAPTER IV

ECONOMIC IMPACT OF MURRAY STATE UNIVERSITY

The total impact of Murray State University on the economy of Kentucky, West Kentucky and Calloway County includes, in addition to the direct benefits presented in Chapter III, the indirect and induced benefits accruing from dollars injected through University-related expenditures. The indirect effects represent the economic activity generated among Kentucky firms to meet the University's need for local goods and services. The induced effects are the result of demand for personal goods and services by University employees, students, and visitors. The indirect and induced benefits arise as the dollars are re-spent through the area.

The Multiplier Concept

Dollars flowing into the state, regional, and local economy through University-related expenditures are received as income by individuals, business firms, and governmental units who provide goods and services to the University community. These income recipients save a fraction of the dollars but re-spend most of them on capital goods or personal goods and services which become income to others. These rounds of spending continue until the "leakages" from saving and flows outside the area equal the initial income injections. The result of the rounds of spending is to increase aggregate income by some "multiple" of the initial dollars injected through University-related expenditures. The multiplier is a ratio for calculating the estimated total economic impact of an economic engine, like Murray State, by quantifying the indirect and induced effects of expenditures and including them with the direct expenditures.

The magnitude of the multiplier for a given area depends upon a number of factors including its income and employment levels, its industrial base, and the consumption-savings patterns of its residents, all of which influence the rate of leakages of money outside the income stream or area. Generally, the multiplier for a large industrial area that is relatively self-sufficient tends to be large, and for a small area that imports a large proportion of its industrial products, building materials, processed foods, and consumer durables, the multiplier would be relatively small.

The multipliers employed to estimate the impact of spending by Murray State, Murray State employees, Murray State students, and visitors to University events and personnel, on the economies of Kentucky, West Kentucky, and Calloway County were RIMS II, Type II Multipliers (Regional Input-Output Modeling Systems) which were calculated for Kentucky, the eighteen-county West Kentucky-service region, and Calloway County by the Bureau of Economic Analysis of the U.S. Department of Commerce. RIMS II, Type II multipliers are based on BEA's material Input-Output (I-O) table, which shows the input and output structure of nearly 500 U.S. industries. BEA's regional economic accounts are used to adjust the national I-O Table to reflect a region's industrial structure and trading patterns. RIMS II is widely used in both the public and private sector. In the public sector, RIMS II may be used to estimate the regional impacts of closing military bases, the construction or expansion of airports, and the impact of colleges and universities. In the private sector, RIMS II may be used to estimate the impact of theme parks, shopping malls, or professional athletic franchises.⁴⁵

⁴⁵ Regional Multiplier, [A User Handbook for the Regional Input-Output Modeling System \(RIMS II\)](#) U.S. Department of Commerce, Bureau of Economic Analysis, Washington, D.C.

The RIMS II, Type II, multipliers calculated for Kentucky, West Kentucky, and Calloway County are used to estimate the impact of Murray State University on the income, employment, credit bases, and tax bases of Kentucky, West Kentucky and Calloway County. The specific multipliers employed to calculate the impact of University-related spending on the economy of Kentucky were: University budgetary expenditures, 1.95; University construction expenditures, 2.12; University employee expenditures, 1.95; University student expenditures, 1.83; University visitor expenditures, 1.92; and University-related tax expenditures, 2.07. The specific multipliers employed to calculate the impact of University-related spending on the economy of West Kentucky were: University budgetary expenditures, 1.54; University construction expenditures, 1.64; University employee expenditures, 1.54; University student expenditures, 1.46; University visitor expenditures, 1.49; and University-related tax expenditures, 1.68. The specific multipliers employed to calculate the impact of University-related spending on the economy of Calloway County were: University budgetary expenditures, 1.36; University construction expenditures, 1.31; University employee expenditures, 1.36; University student expenditures, 1.29; University visitor expenditures, 1.33; and University-related tax expenditures, 1.52. A multiplier of 2.0 implies that each dollar of direct University-related spending results in \$1.00 of additional spending in the respective region.

It is emphasized that the multipliers used in this analysis are appropriate for new money injected into the region. An implicit assumption is that, if Murray State University did not exist, the money spent by Murray State, its employees, students, and visitors would not be spent in the areas defined. This may or may not be the case. However, it would be difficult to determine the population patterns, size and skill of the labor force, and configuration of the local, regional, and state economy without

Murray State. Therefore, the analysis was based on the assumption that, in the absence of Murray State, the University-related expenditures would not exist or would be spent outside the defined areas.

Impact of Murray State University on Kentucky

The total benefits to the economy of Kentucky resulting from Murray State-related expenditures may be estimated with the following formula:

$$(B_K)_{UR} = [(U_B \times M_B) + (U_C \times M_C) + (U_E \times M_E) + (U_S \times M_S) + (U_V \times M_V) + (U_T \times M_T)]$$

where:

- $(B_K)_{UR}$ = benefits to Kentucky from University-related expenditures
- $(U_B \times M_B)$ = University budget(s) expenditures times budget expenditure multiplier
- $(U_C \times M_C)$ = University construction expenditures times construction multiplier
- $(U_E \times M_E)$ = University employee expenditures times employee expenditure multiplier
- $(U_S \times M_S)$ = University student expenditures times student expenditure multiplier
- $(U_V \times M_V)$ = University visitor expenditure times visitor expenditure multiplier
- $(U_T \times M_T)$ = University-related tax expenditures times tax multiplier

The total benefit of Murray State University on the economy of Kentucky was estimated at:

$$(B_K)_{UR} = [(\$25,068,326 \times 1.95) + (\$10,413,760 \times 2.12) + (\$56,585,455 \times 1.95) + (\$144,288,630 \times 1.83)]$$

$$\begin{aligned}
& + (\$6,300,989 \times 1.92) + (\$18,169,514 \times 2.07)] \\
& = \$48,883,236 + \$22,077,171 + \$110,341,637 + \$264,048,193 \\
& + \$12,097,899 + \$37,610,894 \\
& = \$495,059,030
\end{aligned}$$

A summary of the total impact of Murray State University on the economy of Kentucky is shown in Table 60.

TABLE 58

IMPACT OF SPENDING GENERATED BY MURRAY STATE UNIVERSITY ON KENTUCKY

Source of Spending	Total Spending in Kentucky	Total Economic Impact
Murray State Budget(s)	\$ 25,068,326	\$ 48,883,236
Murray State Construction	10,413,760	22,077,171
Murray State Employees	56,585,455	110,341,637
Murray State Students	144,288,630	264,048,193
MSU-Related Visitors	6,300,989	12,097,899
Taxes to Kentucky	18,169,514	37,610,894
Total	\$260,826,674	\$495,059,030

SOURCE: Murray State University Budgets. Survey of employees and students and the multipliers.

Jobs Attributed to Murray State

The presence of Murray State increases the level of employment in Kentucky.

The increase in state jobs attributable to Murray State was estimated with the formula:

$$J_K = (E_K)_{UR} \times j$$

where:

J_K = total number of jobs in Kentucky attributed to Murray State

$(E_K)_{UR}$ = total University-related expenditures in Kentucky

j = full-time jobs per dollar of direct expenditures in Kentucky⁴⁶

The number of jobs in Kentucky attributable to Murray State University was estimated at:

$$\begin{aligned} J_K &= \$260,826,674 \times .0000231 \\ &= 6,025 \end{aligned}$$

This includes 1,385 full-time persons in Kentucky employed directly by the University and an estimated 4,640 jobs created indirectly through University-related expenditures.⁴⁷

Impact on Kentucky's Credit Base

Murray State University, its employees, and students have a significant impact on the credit base of Kentucky's banks and financial institutions through deposits held in those institutions. The estimated impact of the University on the state's credit base was calculated as follows:

$$\Delta CB_{FI} = (D_U + D_{UE} + D_{US}) L/D$$

where:

ΔCB_{FI} = change in credit base of banks and financial institutions located in Kentucky

D_U = average annual deposits of University in banks and financial institutions in Kentucky

D_{UE} = average annual deposits of University employee households in banks and financial institutions in Kentucky

D_{US} = average annual deposits of University student households in banks and financial institutions in Kentucky

⁴⁶ U.S. Department of Commerce, Bureau of Economic Analysis, RIMS II, Type II, July 2016. This is an expenditure-employment coefficient linking the relationship of spending to jobs at a ratio of 23.1 jobs for each \$1 million expenditure.

⁴⁷ Murray State employees included 420 administrators, 488 faculty, and 551 hourly staff.

L/D = average loan-to-deposit ratio of banks and financial institutions in Kentucky⁴⁸

The estimated average annual deposits held in Kentucky banks and financial institutions by the University, its employees, and students is shown in Table 61.

Based on the data in Table 61, the impact of Murray State on Kentucky's credit base is:

$$\begin{aligned} \Delta CB_{FI} &= (\$18,299,082 + \$35,962,117 + \$28,775,598) \cdot .80 \\ &= \$66,429,438 \end{aligned}$$

TABLE 59

ESTIMATED CHECKABLE AND SAVING DEPOSITS OF MURRAY STATE,
ITS EMPLOYEES AND STUDENTS HELD IN KENTUCKY
BANKS AND FINANCIAL INSTITUTIONS

Source	Average Deposits by Source	Average Annual Deposits
University	\$18,299,082	\$ 18,299,082
Employees		
Administrators	56,482	22,705,764
Faculty	20,398	9,138,304
Staff	7,501	4,118,049
Students	2,803	28,775,598
TOTAL		\$83,036,797

Impact of Murray State University on West Kentucky

The total benefits to the economy of Kentucky resulting from Murray State-related expenditures may be estimated with the following formula:

⁴⁸ Ellen Dale, CPA, Director, Accounting and Financial Services, Murray State University, and Bob Hargrove, President and CEO, The Murray Bank, Murray, Kentucky. The estimated average loans-to-deposits ratio for banks and other lending institutions is .80.

$$(B_{WK})_{UR} = [(U_B \times M_B) + (U_C \times M_C) + (U_E \times M_E) + (U_S \times M_S) + (U_V \times M_V) + (U_T \times M_T)]$$

where:

$(B_{WK})_{UR}$	=	benefits to West Kentucky from University-related expenditures
$(U_B \times M_B)$	=	University budget(s) expenditures times budget expenditure multiplier
$(U_C \times M_C)$	=	University construction expenditures times construction multiplier
$(U_E \times M_E)$	=	University employee expenditures times employee expenditure multiplier
$(U_S \times M_S)$	=	University student expenditures times student expenditure multiplier
$(U_V \times M_V)$	=	University visitor expenditure times visitor expenditure multiplier
$(U_T \times M_T)$	=	University-related tax expenditures times tax multiplier

The total benefit of Murray State University on the economy of West Kentucky was estimated at:

$$\begin{aligned} (B_{WK})_{UR} &= [(\$22,607,253 \times 1.54) + (\$7,833,964 \times 1.64) \\ &+ (\$46,263,769 \times 1.54) + (\$113,726,748 \times 1.46) \\ &+ (\$7,744,096 \times 1.49) + (\$5,689,020 \times 1.68) \\ &= \$34,815,170 + \$12,847,701 + \$71,246,204 \\ &+ \$166,041,052 + \$11,538,703 + \$9,557,554 \\ &= \$306,046,384 \end{aligned}$$

A summary of the total impact of Murray State University on the economy of West Kentucky is shown in Table 62.

TABLE 60

IMPACT OF SPENDING GENERATED BY MURRAY STATE
UNIVERSITY ON WEST KENTUCKY

Source of Spending	Total Spending in West Kentucky	Total Economic Impact
Murray State Budget(s)	\$ 22,607,253	\$ 34,815,170
Murray State Construction	7,833,964	12,847,701
Murray State Employees	46,263,769	71,246,204
Murray State Students	113,726,748	166,041,052
MSU-Related Visitors	7,744,096	11,538,703
Taxes to Kentucky	5,689,020	9,557,554
Total	\$203,864,850	\$306,046,384

SOURCE: Murray State University Budgets. Survey of employees and students and the multipliers.

Jobs Attributable to Murray State

The presence of Murray State increases the level of employment in West Kentucky. The increase in West Kentucky jobs attributable to Murray State was estimated with the formula:

$$J_{WK} = (E_{WK})_{UR} \times j$$

where:

- J_{WK} = total number of jobs in West Kentucky attributed to Murray State
- $(E_{WK})_{UR}$ = total University-related expenditures in West Kentucky
- j = full time jobs per dollar of direct expenditures in West Kentucky⁴⁹

The number of jobs in West Kentucky attributable to Murray State was estimated at:

⁴⁹ U.S. Department of Commerce, Bureau of Economic Analysis, RIMS II, Type II, July 2016. This is an expenditure-employment coefficient linking the relationship of spending to jobs at a ratio of 18.7 jobs for each \$1 million expenditure.

$$\begin{aligned}
 J_{WK} &= \$203,864,850 \times .0000187 \\
 &= 3,812
 \end{aligned}$$

This includes 1,385 full time-persons in West Kentucky employed directly by the University and an estimated 2,427 jobs created indirectly through University-related expenditures.⁵⁰

Impact on West Kentucky Credit Base

Murray State University, its employees, and students have a significant impact on the credit base of West Kentucky banks and financial institutions through deposits held in those institutions. The estimated impact of the University on the regional credit base was calculated as follows:

$$\Delta CB_{FI} = (D_U + D_{UE} + D_{US}) L/D$$

where:

- ΔCB_{FI} = change in credit base of banks and financial institutions located in West Kentucky
- D_U = average annual deposits of University in banks and financial institutions in West Kentucky
- D_{UE} = average annual deposits of University employee households in banks and financial institutions in West Kentucky
- D_{US} = average annual deposits of University student households in banks and financial institutions in West Kentucky
- L/D = average loan-to-deposit ratio of banks and financial institutions in West Kentucky⁵¹

The estimated average annual deposits held in West Kentucky banks and financial institutions by the University, its employees, and students are shown in

⁵⁰ Murray State employees residing in West Kentucky included 404 administrators, 449 faculty members, and 532 staff personnel.

⁵¹ Bob Hargrove, President and CEO, The Murray Bank, Murray, Kentucky. The estimated average loans-to-deposit ratio for banks and other lending institutions is .80.

Table 63. Based on the data in Table 63, the impact of Murray State University on the regional credit base is:

$$\begin{aligned} \Delta CB_{FI} &= (\$14,296,990 + \$34,615,770 + \$21,538,068) .80 \\ &= \$56,360,662 \end{aligned}$$

TABLE 61

ESTIMATED CHECKABLE AND SAVING DEPOSITS OF MURRAY STATE,
ITS EMPLOYEES, AND STUDENTS HELD IN WEST KENTUCKY
BANKS AND FINANCIAL INSTITUTIONS

Source	Average Deposits by Source	Average Annual Deposits
University	\$14,296,990	\$14,296,990
Employees		
Administrators	54,346	21,847,092
Faculty	20,367	9,124,416
Staff	6,638	3,644,262
Students	2,098	21,538,068
TOTAL		\$70,450,828

The total benefits to the economy of Calloway County resulting from Murray State-related expenditures may be estimated with the following formula:

$$(B_L)_{UR} = [(U_B \times M_B) + (U_C \times M_C) + (U_E \times M_E) + (U_S \times M_S) + (U_V \times M_V) + (U_T \times M_T)]$$

where:

- $(B_L)_{UR}$ = benefits to Calloway County from University-related expenditures
- $(U_B \times M_B)$ = University budget(s) expenditures times budget expenditure multiplier
- $(U_C \times M_C)$ = University construction expenditures times construction multiplier
- $(U_E \times M_E)$ = University employee expenditures times employee expenditure multiplier
- $(U_S \times M_S)$ = University student expenditures times student expenditure multiplier
- $(U_V \times M_V)$ = University visitor expenditure times visitor expenditure multiplier
- $(U_T \times M_T)$ = University-related tax expenditures times tax multiplier

The total benefit of Murray State University on the economy of Calloway County was estimated at:

$$\begin{aligned} (B_L)_{UR} &= [(\$13,479,694 \times 1.36) + (\$1,366,847 \times 1.36) \\ &+ (\$40,279,294 \times 1.36) + (\$86,142,006 \times 1.29) \\ &+ (\$13,204,938 \times 1.33) + (\$4,332,485 \times 1.42) \\ &= \$18,332,384 + \$1,858,912 + \$54,779,840 \\ &+ \$111,123,188 + \$17,562,568 + \$6152,129 \\ &= \$209,809,021 \end{aligned}$$

A summary of the total impact of Murray State University on the economy of Calloway County is shown on Table 64.

TABLE 62

IMPACT OF SPENDING GENERATED BY MURRAY STATE UNIVERSITY ON CALLOWAY COUNTY

Source of Spending	Total Spending in Calloway County	Total Economic Impact
Murray State Budget(s)	\$ 13,479,694	\$ 18,332,384
Murray State Construction	1,366,847	1,858,912
Murray State Employees	40,279,294	54,779,840
Murray State Students	86,142,006	111,123,188
MSU-Related Visitors	13,204,938	17,562,568
Taxes to Kentucky	4,332,485	6,152,129
Total	\$158,805,264	\$209,809,021

SOURCE: Murray State University Budgets. Survey of employees and students and the multipliers.

Jobs Attributable to Murray State University

The presence of Murray State increases the level of employment in Calloway County. The increase in local jobs attributable to Murray State was estimated with the formula:

$$J_L = (E_L)_{UR} \times j$$

where:

J_L = total number of jobs in Calloway County attributed to Murray State

$(E_L)_{UR}$ = total University-related expenditures in Calloway County

j = full-time jobs per dollar of direct expenditures in Calloway County ⁵²

The number of jobs in Calloway County attributable to Murray State was estimated at:

$$J_L = \$158,805,264 \times .0000182$$

$$= 2,890$$

This includes 1,111 full time persons in Calloway County employed directly by the University and estimated 1,779 jobs created indirectly through University-related expenditures.⁵³

Impact on Calloway County Credit Base

Murray State University, Its employees and students have a significant impact on the credit base of Calloway County banks and the financial institutions through deposits held in those institutions. The estimated impact of the University on the local credit base was calculated as follows:

$$\Delta CB_{FI} = (D_U + D_{UE} + D_{US}) L/D$$

where:

ΔCB_{FI} = change in credit base of banks and financial institutions located in Calloway County

D_U = average annual deposits of University in banks and financial institutions in Calloway County

D_{UE} = average annual deposits of University employee households in banks and financial institutions in Calloway County

D_{US} = average annual deposits of University student households in banks and financial institutions in Calloway County

⁵² U.S. Department of Commerce, Bureau of Economic Analysis, RIMS II, Type II, July 2016. This is an expenditure-employment coefficient linking the relationship of spending to jobs at a ratio of 18.7 jobs for each \$1 million expenditure.

⁵³ Murray State employees residing in Calloway County included 341 administrative, 390 teaching faculty, and 380 staff personnel.

L/D = average loan-to-deposit ratio of banks and financial institutions in Calloway County⁵⁴

The estimated average annual deposits held in Calloway County banks and financial institutions by the University, its employees, and students is shown in Table 65. Based on the data in Table 65, the impact of Murray State on the regional credit base is:

$$\begin{aligned} \Delta CB_{FI} &= (\$14,296,990 + \$31,662,505 + \$17,914,170) .80 \\ &= \$51,098,932 \end{aligned}$$

TABLE 63

ESTIMATED CHECKABLE AND SAVING DEPOSITS OF MURRAY STATE,
ITS EMPLOYEES AND STUDENTS HELD IN CALLOWAY COUNTY
BANKS AND FINANCIAL INSTITUTIONS

Source	Average Deposits by Source	Average Annual Deposits
University	\$14,296,990	\$14,296,990
Employees		
Administrators	49,796	20,017,992
Faculty	19,702	8,826,496
Staff	5,133	2,818,017
Students	1,745	17,914,170
TOTAL		\$63,873,665

The estimated impact of Murray State University on the economy of Calloway County is consistent with the estimated impact of Campbellsville University on the economy of Taylor County and the estimated impact of Western Kentucky University on the economy of Warren County when the relative sizes of the universities are taken

⁵⁴ Bob Hargrove, President and CEO, The Murray Bank, Murray, Kentucky. The estimated average loans-to-deposit ratio for banks and other lending institutions is .80.

into consideration. The estimated impact of Campbellsville University on the economy of Taylor County was \$104.9 million,⁵⁵ and the impact of Western Kentucky University on the economy of Warren County was estimated at \$341.3 million⁵⁶ during the 2014-2015 fiscal year.

CHAPTER V

⁵⁵ Campbellsville University Economic Impact 2014/2015, Younger Associates, Jackson, Tennessee.

⁵⁶ Catherine Carey, Interim Director, WKY Center for Applied Economics. Western Kentucky University, Bowling Green, Kentucky.

IMPACT OF MURRAY STATE UNIVERSITY ON THE STATE AND REGIONAL ECONOMIC AND SOCIAL INFRASTRUCTURE

The short-run direct and indirect impacts of a college or university on the economy of a state, region, or county, including monetary injections, tax revenue generated, jobs created and the impact on the credit base is quite apparent and relatively easy to estimate. The long-run impacts that an institution of higher education has on the general economic and social infrastructure of a region, in terms of human capital, economic development, the level of technology, social diversity, and the general quality of life, is less obvious and more difficult to quantify.

While it was beyond the scope of this study to estimate the long-run impact of Murray State University on the economic and social infrastructure of Kentucky or West Kentucky, including Calloway County, attention was focused on data which shows the relationship of educational opportunities to selected indicators reflecting the economic and social well-being of the state and region.

Impact on Human Capital

The contribution of higher education to investment in human capital is partially reflected by the level of educational achievement attained by the citizens of the Commonwealth of Kentucky. The top fifteen counties in Kentucky, with respect of the population, age 25 and older, completing four years of college is shown in Table 66. As shown in Table 66, nine of the top fifteen counties in Kentucky, with respect to the percent of the population 25 years and older who have completed four years of college, have one or more four-year institutions of higher education. The remaining six counties are adjacent to counties with one or more four-year colleges or universities.

TABLE 64

PERCENT OF POPULATION 25 YEARS AND OLDER
WITH BACHELOR'S DEGREE OR HIGHER
DURING 2013

County	Percent with Bachelor's Degree or Higher
Fayette	40.1
Oldham	40.1
Woodford	31.6
Boone	30.4
Jefferson	30.4
Kenton	29.1
Campbell	28.5
Warren	28.4
Madison	28.0
Scott	27.9
Calloway	27.7
Jessamine	27.4
Franklin	26.8
Rowan	23.8
Shelby	23.8
Kentucky	21.5

SOURCE: U. S. Department of Commerce, Bureau of the Census, County and City Data.

The data from which Table 66 was secured also showed that the fifteen counties with the lowest percentage of persons, age 25 years and older, completing four years of college did not have an institution of higher education.

The contribution of higher education to human capital is also partially reflected by the level of family income. The fifteen counties with the highest median family income in Kentucky during 2015 is shown in Table 67. As shown in Table 67, six of the fifteen counties with the highest median family income, had one or more four-year institutions of higher education. The remaining nine counties are adjacent to counties

with one or more four-year colleges.. The data from which Table 67 was secured also showed that only five of the fifteen counties with the lowest median family income had a four-year college and none of them had a four-year public college or university.

TABLE 65
2010 MEDIAN FAMILY INCOME

County	Median Household Income
Oldham	\$89,911
Boon	77,474
Shelby	68,647
Campbell	68,431
Scott	68,219
Woodford	67,094
Fayette	66,690
Kenton	66,170
Spenser	64,350
Anderson	63,815
Franklin	61,086
Bullitt	59,435
Jefferson	59,182
Warren	57,523
Owen	56,794
Kentucky	\$52,046

SOURCE: U. S. Department of Commerce, Bureau of the Census, Kentucky, 2011.

A comparison of the data in Table 66 and Table 67 shows that eleven of the top fifteen counties, with respect to the percent of persons 25 years of age or older with a college degree, are also in the top fifteen counties with respect to median family income. The exceptions, Calloway, Roan, Madison, and Jessamine are all located outside of the “Golden Triangle” of economic prosperity.

It is recognized that many factors influence the level of income of a region and that the data presented do not offer any statistical measure of the impact of higher education. However, the data do suggest a linkage between the availability of higher education and the level of educational attainment of the population and to the level of income of a county or region.

The contribution of Murray State University to human capital is partially reflected by the number of Murray State graduates residing in Kentucky and the average income differential between high school and college graduates. During 2013, average earnings of male, full-time, year-round workers with a Bachelor’s Degree, were \$31,654 higher than that of high school graduates. Average earnings of female, full-time, year-round workers with Bachelor’s Degrees were \$23,391 higher than that of female high school graduates.⁵⁷ The earnings were adjusted to Kentucky wages at 82 percent of the U.S. averages.⁵⁸

Currently, 34,442 Murray State graduates (20,441 female and 14,001 male) reside in Kentucky. ⁵⁹ Based on the differential between earnings of college graduates and high school graduates, the potential additional earning capacity of Murray State graduates in Kentucky is \$921,323,085. Currently, 24,692 Murray State graduates

⁵⁷ U.S. Department of Commerce, Bureau of the Census, Current Population Survey, 2014 Annual Social and Economic Supplement,” PINC-04, Total money earnings, educational attainment.

⁵⁸ U.S. Department of Commerce, Bureau of Economic Analysis, Survey of Current Business, “Per Capita Personal Income by State, 2012.”

⁵⁹ Misty Williams, Assistant Direct of Alumni Affairs, Murray State University

(14,968 female and 9,724 male) reside in West Kentucky. Based on the differential between earnings of college graduates and high school graduates, the potential additional earning capacity of Murray State graduates in West Kentucky is \$657,919,984. There are 5,146 Murray State graduates (2,922 female and 2,224 male) residing in Calloway County. This represents an estimated potential additional earning capacity of \$138,746,998. It should be noted that the differentials in potential earning capacities shown do not include the additional earning capacities associated with graduate degrees. It should also be noted that the above estimates are potential additional earnings and not estimated additional earnings. Not all Murray State graduates residing in Kentucky, West Kentucky, and Calloway County are employed, and some of those are underemployed, i.e., working at jobs not fully utilizing their skills or productive capacities.

Impact on Economic Development

The contribution of higher education to the level of economic development is partially reflected in variations in employment of citizens of the Commonwealth. The fifteen Kentucky counties with the lowest unemployment rates during 2015 are shown in Table 68. Thirteen of the fifteen counties with the lowest unemployment rates during 2015 were counties with or adjacent to counties with a four-year college. One of the remaining two counties was located adjacent to the Golden Triangle. By contrast, only two of the fifteen counties with the highest unemployment rates had a four-year college or university. This is not surprising, given that industry location is influenced, inter alia, by the availability and quality of higher education in the area.

TABLE 66

UNEMPLOYMENT RATE DURING 2015

County	Percent Unemployed
Woodford	3.6
Fayette	3.9
Oldham	4.0
Owen	4.1
Scott	4.1
Shelby	4.1
Anderson	4.2
Boone	4.2
Campbell	4.2
Jessamine	4.3
Franklin	4.4
Madison	4.4
Monroe	4.4
Spenser	4.4
Washington	4.4
Kentucky	5.4

SOURCE: Corey Jennings, Local Area Unemployment Statistics, Workforce Intelligence Branch, Frankfort, Kentucky.

Impact on Technology

Although it is beyond the scope of the study to assess the impact of Murray State University on the level of technology in the state or region, the input provided by the University and its employees is reflected by workshops and seminars, consulting activities and research conducted which provide knowledge applicable to production.

During the 2015-2016 Fiscal Year numerous workshops and seminars were held and services were provided through the Breathitt Veterinary Center, Hancock Biological Station, Center for Economic Education, Center for Banking and Finance, and West Kentucky Small Business Development Center. As an example, the West

Kentucky Small Business Development Center conducted 29 training events with over 478 attendees during the past year.⁶⁰ Educational events open to the public included the Harry M. Sparks Lecture through the College of Education, the Harry Lee Waterfield Lecture through the Department of Political Science and Sociology, and programs for regional farmers and agricultural businesses such as the Soybean Promotion Day scheduled through the Hudson School of Agriculture. In addition to teaching and providing educational events to the public, University faculty members were involved in 115 externally-funded and 26 internally-funded research projects during the 2015-2016 Fiscal Year.⁶¹ Murray State University faculty members were sponsors or mentors to over 1,200 graduate and undergraduate students involved in research, scholarly, or creative activities.⁶²

During the 2015-2016 Fiscal Year, Murray State faculty members spent an estimated 9,345 days consulting in Calloway County; 6,212 days consulting in West Kentucky outside Calloway County; and 7,218 days consulting in Kentucky outside West Kentucky. University administrators spent an estimated 4,439 days consulting in Calloway County; 231 days consulting in West Kentucky outside Calloway County; and 210 days in Kentucky outside West Kentucky.

Impact on Social Diversity

While no attempt is made in this study to measure the impact of Murray State University on the social diversity of the region, some of the ways that the University contributes to the heterogeneity of the area are mentioned.

⁶⁰ Christ Wooldridge, District Director, West Kentucky Small Business Development Center, Murray State University.

⁶¹ Dr. Robert Pervine, Associate Provost for Graduate Education and Research, Murray State University.

⁶² Heather Macha, Grants and Contract Manager, Murray State University.

Murray State faculty, most of whom live in West Kentucky, hold degrees from over 290 colleges or universities located in 42 states, the District of Columbia and 76 colleges or universities in 26 foreign countries.⁶³

Murray State's 2015-2016 student body included 1,422 members of Greek organizations of whom 864 belonged to sororities and 558 belonged to fraternities.⁶⁴ A brief analysis of non-university expenditures indicated that students who were members of sororities and fraternities spent an average of \$8,607 per year in the local economy compared to an average of \$8,359 for non-Greeks. While this does not represent a large difference, it is noted that most Greeks are single while most student households with families are independents.

Murray State's 2015-16 student body also included 3,235 non-resident students of whom 734 were international students. A brief analysis of non-university expenditures indicated that international students spent an average of \$13,719 per year in the local economy compared to an average of \$8,424 for students from the United States. The categories of expenditures in which international students outspent domestic students were housing, utilities, insurance, food, clothing, communication, and transportation. These differences are partially explained in that international students are more likely to stay in the local area during weekends and short breaks than are students from surrounding areas. Also, international students travel greater distances back home or to other U.S. destinations during longer breaks. International students also have higher clothing cost in part due to climate and customs changes. Also many international students receive home country financial support and/or have higher family incomes and more discretionary income.

⁶³ Murray State University 2016-17 Academic Bulletin.

⁶⁴ Jennifer W. Smith, Coordinator of Student Services Office of Enrollment Management, Murray State University.

Impact on Quality of Life

The impact of Murray State University on the quality of life in Kentucky, West Kentucky, and Calloway County is reflected through the involvement of University employees and students in civic and community affairs and in the number of University activities related to continuing education, recreation, entertainment, and cultural events.

One indicator of community involvement by University employees and students is the amount of time contributed to volunteer work. According to survey data, seventy-eight percent of University employees spent one to three hours per month on volunteer activities during the 2015-2016 Fiscal Year. An estimated twenty-one percent of University employees spent ten or more hours per month in volunteer activities. Also, according to survey data, sixty-four percent of Murray State University students volunteered one to three hours per month and about ten percent spent ten or more hours per month in volunteer service.

An indicator of civic involvement is voter participation rates. Murray State administrators, faculty and staff indicated a respective participation rate of 81, 86 and 89 percent during the last four state and national elections. This compares with national voter turnouts of 53.6 percent during the 2012 Presidential election and of 37.8 percent during the 2010 Congressional elections.⁶⁵

Murray State, in addition to credit course offerings, provides regional residents with a variety of continuing education opportunities. During the 2015-2016 Fiscal Year, over 100 workshops, seminars, or other educational programs were scheduled. The University also hosted numerous contests, camps, and enrichment programs for high school students throughout the state. Murray State's Waterfield Library holds

⁶⁵ U.S. Department of Commerce, Statistical Abstract of the United States: 2014.

392,800 books by volume, 153,685 eBooks, 2,055 state government and 228,757 Federal government documents. The library's modern electronic data bases and search capabilities also enhance the opportunity for individualized study.⁶⁶ Pogue Special Collections and archives has periodicals, journals, and books about various American wars and other history including cemetery records, census records, and vital statistics. Pogue also holds the Jesse Stuart and Rare Book collections.⁶⁷

Murray State provides year-round entertainment for sports fans as both spectators and participants. Spectators have the opportunity to support nationally-competitive teams in basketball, football, baseball, tennis, track, golf, volleyball, soccer, marksmanship, rodeo, and rowing. Active participants in sports have access to Murray State facilities for basketball, tennis, racquetball, golf, weightlifting, and soccer, free of charge or for a nominal fee.

Murray State, through the College of Fine Arts, hosts dozens of concerts, art exhibits, and theatrical performances, which provide intellectual stimulation and cultural enlightenment to the region. The University also sponsors art, music, journalism, and broadcasting workshops. Also contributing to the cultural development of the region is the Wrather West Kentucky Museum, Murphy's Pond, the Hancock Biological Station, and events held at the Cherry Agricultural Exposition Center, Pullen Farm, and the Community Financial Services Bank (CFSB) Center.

⁶⁶ Chris Ferguson, Director of Technical Services, Waterfield Library, Murray State University.

⁶⁷ La Donna Hamontree, Library Assistant III, Pogue Special Collection and Archives, Murray State University.

APPENDIX A

FACULTY AND STAFF SURVEY

QUESTIONNAIRE

Murray State University Faculty and Staff Survey Questionnaire



Instructions to Respondent

This questionnaire pertains to your family's spending and income patterns as they relate to the economy of Kentucky, West Kentucky, and Calloway County. Your identification is not known or requested, therefore, all responses are strictly anonymous. The questionnaire is part of a study authorized by Dr. Robert O. Davies and conducted under the direction of Dr. Gilbert L. Mathis, to help evaluate the impact of Murray State University on the economy of Kentucky, on the economy of West Kentucky, and on the economy of Murray and Calloway County. We would like to thank you in advance for your time and consideration in answering the questionnaire.

For each item please give the total dollar amounts spent in Kentucky; the percentage of that amount spent in West Kentucky (including the counties of Ballard, Carlisle, Hickman, Fulton, McCracken, Graves, Marshall, Calloway, Livingston, Lyon, Trigg, Crittenden, Union, Henderson, Webster, Hopkins, Caldwell, and Christian which are located in the shaded area of the map of Kentucky above), and the percentage of that amount spent in Calloway County. Please do not include any expenditures made on the campus of Murray State University (or extended campus locations) or outside Kentucky.

	<u>Expenditures in Kentucky</u>	<u>Percentage of Kentucky Expenditures in West Kentucky</u>	<u>Percentage of Kentucky Expenditures in Calloway County</u>

1. What are your family's average monthly expenditures for housing?			
a. Rent or house payments	\$ _____ month	_____ %	_____ %
b. Insurance (homeowners or renters)	\$ _____ month	_____ %	_____ %
c. Utilities and phone	\$ _____ month	_____ %	_____ %
d. Other (maintenance repair repair, decorating, etc.)	\$ _____ month	_____ %	_____ %
2. What are your family's average monthly expenditures for food, personal care, and household items? (i.e., at grocery stores restaurants and drug stores)			
a. Food and non-alcoholic beverages	\$ _____ month	_____ %	_____ %
b. Alcoholic beverages	\$ _____ month	_____ %	_____ %
c. Tobacco products	\$ _____ month	_____ %	_____ %
d. Soap, paper products cosmetics, etc.	\$ _____ month	_____ %	_____ %
e. Drugs and medicine	\$ _____ month	_____ %	_____ %
f. Other nondurables (detergents, kitchen aids, etc.)	\$ _____ month	_____ %	_____ %

	<u>Expenditures in Kentucky</u>	<u>Percentage of Kentucky Expenditures in West Kentucky</u>	<u>Percentage of Kentucky Expenditures in Calloway County</u>
3. What are your family's average monthly expenditures for transportation?			
a. Personal auto			
i. Gasoline and oil	\$ _____ month	_____ %	_____ %
ii. Repairs/maintenance	\$ _____ month	_____ %	_____ %
iii. Insurance	\$ _____ month	_____ %	_____ %
iv. Non-university parking	\$ _____ month	_____ %	_____ %
b. Other (train/plane)	\$ _____ month	_____ %	_____ %
4. What are your family's average monthly expenditures for clothing, shoes and other accessories in Kentucky?	\$ _____ month	_____ %	_____ %
5. What are your family's average monthly expenditures for services in Kentucky?			
a. Doctors, dentists, and hospitals	\$ _____ month	_____ %	_____ %
b. Health and life insurance (non-university)	\$ _____ month	_____ %	_____ %
c. Sports, recreation or other instructional seminars not provided by the university (golf, piano, estate planning etc.)	\$ _____ month	_____ %	_____ %
d. Rentals	\$ _____ month	_____ %	_____ %
e. Laundry	\$ _____ month	_____ %	_____ %
f. Other	\$ _____ month	_____ %	_____ %
6. What are your family's average yearly expenditures for durable goods purchased in Kentucky?			
a. Household items, appliances, furniture, rugs, TVs, radios etc.	\$ _____ year	_____ %	_____ %
b. Sporting and recreation equipment (guns, golf clubs, etc.)	\$ _____ year	_____ %	_____ %
c. Automobiles, trucks etc.	\$ _____ year	_____ %	_____ %
7. What are your family's average yearly expenditures for recreation and hobbies in Kentucky?			
a. Recreation (games, skiing, hunting, golfing etc.) (Do not include the cost of equipment in 6b above)	\$ _____ year	_____ %	_____ %
b. Hobbies (photography, painting, etc.)	\$ _____ year	_____ %	_____ %

	<u>Expenditures in Kentucky</u>	<u>Percentage of Kentucky Expenditures in West Kentucky</u>	<u>Percentage of Kentucky Expenditures in Calloway County</u>
8. How much does your family spend per month on entertainment in Kentucky?			
a. Items such as books, newspapers, Magazines, CDs, etc. (do not include items bought at the University Bookstore)	\$_____ month	_____ %	_____ %
b. Entertainment such as movies, off campus parties, dances, etc.	\$_____ month	_____ %	_____ %
9. What are your family's annual contributions to charities and religions organizations in Kentucky?	\$_____ year	_____ %	_____ %
10. How much does your family spend on gifts in Kentucky each year?	\$_____ year	_____ %	_____ %
11. What are your yearly expenditures on property taxes?			
a. Residential housing	\$_____ year	_____ %	_____ %
b. Other real estate (farm, business etc.)	\$_____ year	_____ %	_____ %
c. Cars, trucks, boats etc.	\$_____ year	_____ %	_____ %
12. How much Kentucky Income Tax did your family pay last year?	\$_____ year		
13. Where do you reside?	_____		
a. In Calloway County			
b. West Kentucky outside Calloway County			
c. In Kentucky outside of West Kentucky			
d. Outside Kentucky			
14. Are you married? (If no, skip to Question 16.)	_____ Yes	_____ No	
15. Is your spouse employed?	_____ Yes	_____ No	
If Yes,			
a. At Murray State University	_____ Yes		
b. Other than Murray State University	_____ Yes		

16. How many dependent children do you have?
(if none, go to question 18) _____ Children
17. How many dependent children attend
- a. Murray City Schools, K-12 _____ Children
 - b. Calloway County Schools, K-12 _____ Children
 - c. Other public schools in West Kentucky, K-12 _____ Children
 - d. Private schools, K-12 _____ Children
18. How many visitors from outside Calloway County do you have during the average month? _____ Visitors
19. What is the average length of each visit from persons outside the county? _____ Days
20. How many of the visitors attend a major university event? (Ball-game, concert, horse show, etc.) _____ Visitors
21. How many visitors from outside West Kentucky, including those reported in question 18, do you have during an average month? _____ Visitors
22. What is the average length of each visit from persons outside West Kentucky _____ Days
23. How many visitors from outside Kentucky, including those reported in questions 18 and 21, do you have during the average month? _____ Visitors
24. What is the average length of each visit from persons outside Kentucky? _____ Days
25. How many days per year do you do consulting work for pay?
- a. In Calloway County _____ Days
 - b. In West Kentucky outside of Calloway County _____ Days
 - c. Outside West Kentucky _____ Days

26. How many hours per month do you spend on volunteer work? (School, hospital, church, civic, little league)
- _____ None
 _____ 1-3
 _____ 4-6
 _____ 7-9
 _____ 10 or more
27. Of the last four elections (state or national)
- a. How many times were you eligible to vote _____
- b. How many times did you vote _____
28. What is the average monthly balance of your family's savings and checking account?
- \$ _____ Kentucky
 \$ _____ West Kentucky
 \$ _____ Calloway County
29. Please check your status:
- _____ Hourly staff
 _____ Administrative staff
 _____ Teaching faculty

APPENDIX B

STUDENT SURVEY

QUESTIONNAIRE

Murray State University
Student Survey
Questionnaire

Instructions to Respondent



This questionnaire pertains to your spending and income patterns as they relate to the economy of Kentucky, West Kentucky, and Calloway County. Your identification is not known or requested, therefore, all responses are strictly anonymous. The questionnaire is part of a study authorized by Dr. Robert O. Davies and conducted under the direction of Dr. Gilbert L. Mathis, to help evaluate the impact of Murray State University on the economy of Kentucky, on the economy of West Kentucky, and on the economy of Murray and Calloway County. We would like to thank you in advance for your time and consideration in answering the questionnaire.

For each item please give the total dollar amounts spent in Kentucky; the percentage of that amount spent in West Kentucky (including the counties of Ballard, Carlisle, Hickman, Fulton, McCracken, Graves, Marshall, Calloway, Livingston, Lyon, Trigg, Crittenden, Union, Henderson, Webster, Hopkins, Caldwell, and Christian which are located in the shaded area of the map of Kentucky above), and the percentage of that amount spent in Calloway County. Please do not include any expenditures made on the campus of Murray State University (or extended campus locations) or outside Kentucky.

	<u>Expenditures in Kentucky</u>	<u>Percentage of Kentucky Expenditures in West Kentucky</u>	<u>Percentage of Kentucky Expenditures in Calloway County</u>
30. What are your average monthly expenditures for housing?			
e. Rent or house payments	\$ _____ month	_____ %	_____ %
f. Insurance (homeowners or renters)	\$ _____ month	_____ %	_____ %
g. Utilities and phone	\$ _____ month	_____ %	_____ %
h. Other (maintenance repair, repair, decorating, etc.)	\$ _____ month	_____ %	_____ %
31. What are your average monthly expenditures for food, personal care, and household items? (i.e., at grocery stores and drug stores)			
a. Groceries and non-alcoholic beverages	\$ _____ month	_____ %	_____ %
b. Alcoholic beverages	\$ _____ month	_____ %	_____ %
c. Tobacco products	\$ _____ month	_____ %	_____ %
i. Dining out (i.e. sit down)	\$ _____ month	_____ %	_____ %
j. Fast food	\$ _____ month	_____ %	_____ %
e. Soap, paper products cosmetics, etc.	\$ _____ month	_____ %	_____ %
e. Drugs and medicine	\$ _____ month	_____ %	_____ %
f. Other nondurables (detergents, kitchen aids, etc.)	\$ _____ month	_____ %	_____ %

	<u>Expenditures in Kentucky</u>	<u>Percentage of Kentucky Expenditures in West Kentucky</u>	<u>Percentage of Kentucky Expenditures in Calloway County</u>
32. What are your average monthly expenditures for transportation?			
j. Personal auto			
i. Gasoline and oil	\$ _____ month	_____ %	_____ %
ii. Repairs/maintenance	\$ _____ month	_____ %	_____ %
iii. Insurance	\$ _____ month	_____ %	_____ %
iv. Non-university parking	\$ _____ month	_____ %	_____ %
b. Other (train/plane)	\$ _____ month	_____ %	_____ %
33. What are your average monthly expenditures for clothing, shoes and other accessories in Kentucky?	\$ _____ month	_____ %	_____ %
34. What are your average monthly expenditures for services in Kentucky?			
g. Doctors, dentists, and hospitals	\$ _____ month	_____ %	_____ %
h. Health and life insurance (non-university)	\$ _____ month	_____ %	_____ %
i. Sports, recreation or other instructional seminars not provided by the university (golf, piano, estate planning etc.)	\$ _____ month	_____ %	_____ %
j. Rentals	\$ _____ month	_____ %	_____ %
k. Laundry	\$ _____ month	_____ %	_____ %
l. Other	\$ _____ month	_____ %	_____ %
35. What are your average yearly expenditures for durable goods purchased in Kentucky?			
d. Household items, appliances, furniture, rugs, TVs, radios etc.	\$ _____ year	_____ %	_____ %
e. Sporting and recreation equipment (guns, golf clubs, etc.)	\$ _____ year	_____ %	_____ %
f. Automobiles, trucks etc.	\$ _____ year	_____ %	_____ %
36. What are your average yearly expenditures for recreation and hobbies in Kentucky?			
c. Recreation (games, skiing, hunting, golfing etc.) (Do not include the cost of equipment in 6b above)	\$ _____ year	_____ %	_____ %
d. Hobbies (photography, painting, etc.)	\$ _____ year	_____ %	_____ %

	<u>Expenditures in Kentucky</u>	<u>Percentage of Kentucky Expenditures in West Kentucky</u>	<u>Percentage of Kentucky Expenditures in Calloway County</u>
37. How much do you spend per month on entertainment in Kentucky?			
c. Items such as books, newspapers, Magazines, CDs, etc. (do not include items bought at the University Bookstore)	\$ _____ month	_____ %	_____ %
d. Entertainment such as movies, off campus parties, dances, etc.	\$ _____ month	_____ %	_____ %
38. What are your annual contributions to charities and religious organizations in Kentucky?	\$ _____ year	_____ %	_____ %
39. How much do you spend on gifts in Kentucky each year?	\$ _____ year	_____ %	_____ %
40. What are your yearly expenditures on property taxes?			
a. Residential housing	\$ _____ year	_____ %	_____ %
b. Other real estate (farm, business etc.)	\$ _____ year	_____ %	_____ %
c. Cars, trucks, boats etc.	\$ _____ year	_____ %	_____ %
41. How much Kentucky Income Tax did you pay last year?	\$ _____ year		
42. Where do you reside?	_____		
a. University housing			
b. Off campus in Calloway County			
c. West Kentucky outside of Calloway County			
d. Kentucky outside West Kentucky			
e. Outside Kentucky			
43. Do you have an off campus job?	_____ Yes	_____ No	
44. Are you married? (If no, skip to Question 47)	_____ Yes	_____ No	
45. Is your spouse a student at Murray State?	_____ Yes	_____ No	

46. Is your spouse employed? _____ Yes _____ No
a. If yes, _____
b. At Murray State
c. Other than Murray State
47. How many dependent children do you have? _____ Children
(if none, go to question 49)
48. How many dependent children attend
a. Murray City Schools, K-12 _____ Children
b. Calloway County Schools, K-12 _____ Children
c. Other public schools in West Kentucky, K-12 _____ Children
d. Private schools, K-12 _____ Children
49. How many visitors from outside Calloway County do you have during the average month? _____ Visitors
50. What is the average length of each visit from persons outside the county? _____ Days
51. How many of the visitors attend a major university event? (Ball-game, concert, horse show, etc.) _____ Visitors
52. How many visitors from outside West Kentucky, including those reported in question 49, do you have during an average month? _____ Visitors
53. What is the average length of each visit from persons outside West Kentucky _____ Days
54. How many visitors from outside Kentucky, including those reported in questions 49 and 52, do you have during the average month? _____ Visitors
55. What is the average length of each visit from persons outside Kentucky? _____ Days
56. How many school sanctioned events do you attend per month? _____ Events

57. How many hours per month do you spend on volunteer work? (School, hospital, church, civic, little league)
- _____ None
 _____ 1-3
 _____ 4-6
 _____ 7-9
 _____ 10 or more
58. Of the last four elections (state or national)
- a. How many times were you eligible to vote _____
- b. How many times did you vote _____
59. What is your home county, state and country?
- _____ County _____ State _____ Country
60. Are you involved in a greek organization?
 If so, what type?
- _____ Yes _____ No
- a. Social _____
 b. Business _____
 c. Academic _____
 d. other _____
61. What kind of tuition do you pay?
- _____ Kentucky resident
 _____ Tennessee waiver
 _____ Illinois regional
 _____ Indiana regional
 _____ Missouri
 _____ Non-resident
62. Other than financial aid for school, are you receiving government assistance (e.g., food stamps, unemployment).
- _____ Yes _____ No
63. Are you receiving a scholarship or grant?
 If yes, how much per year?
 Scholarship? \$ _____ Per year
 Grant? \$ _____ Per year
64. What is your total income from all sources? (including that of your spouse if you are married)
- _____ under \$10,000
 _____ \$10,000 - \$19,999
 _____ \$20,000 - \$29,999
 _____ \$30,000 - \$39,999
 _____ \$40,000 - \$49,999
 _____ over \$50,000
65. What percentage of your college expenses (including tuition and living expenses) are met by the following sources?
- _____ % Self/Spouse
 _____ % Parents
 _____ % Loans
 _____ % Other

66. What is the average monthly balance of your family's (if married) savings and checking account?

\$ _____ Kentucky
\$ _____ West Kentucky
\$ _____ Calloway County

APPENDIX C
RESOURCE PERSONS

RESOURCE PERSONS

Kim Arington, Senior Associate for Academic Program Management, Kentucky Council on Postsecondary Education, Frankfort Kentucky.

Steve Austin, Mayor, Henderson, Kentucky.

Sue Baker, Administrative Associate/Fiscal Court Clerk, Henderson County, Henderson Kentucky.

Becky Ballard, Director, William Cherry Expo Center, Murray State University.

Dr. R. Andrew Batts, Professor Emeritus, Department of Computer Science and Information Systems.

Dr. Tony Brandon, Dean, Hutson School of Agriculture, Murray State University.

Donald Carroll, Hopkins County Judge Executive, Madisonville, Kentucky.

Dr. Michael V. Carter, President, Campbellsville University, Campbellsville, Kentucky.

Dr. Daniel Claiborne, Chair, Industrial Engineering, Murray State University.

Dr. Stephen Cobb, Dean, Jessie D. Jones College of Science, Engineering, and Technology, Murray State University.

Luke Crawford, Director of Finance, City of Murray, Kentucky.

Dr. Ron Crouch, Director, Research and Statistics, Kentucky Career Center, Office of Employment and Training, Kentucky Office of Education and Workforce Development Cabinet, Frankfort, Kentucky.

Walter G. Cummings, Treasurer, Christian County, Hopkinsville, Kentucky.

Nikki McMillen-Crouch, Calloway County Property Valuation Administration, Murray, Kentucky.

Codie Courtney, Graves County Treasurer, Mayfield, Kentucky.

Sidney Castherald

Ellen Dale, Director Accounting and Financial Services, Murray State University, Murray, Kentucky.

Dr. Robert Davies, President, Murray State University, Murray, Kentucky.

Jackie Dudley, Vice President and Chief Financial Officer, Murray State University.

Dr. David Eaton, Chair, Department of Economics and Finance, Murray State University, Murray, Kentucky.

Larry Elkins, Calloway County Judge Executive, Murray, Kentucky.

Antonia Faulkner, Calloway County Clerk, Murray, Kentucky.

Chris Ferguson, Director of Technical Services, Waterfield Library, Murray State University, Murray, Kentucky.

Phil Flynn, Economist, Kentucky Cabinet or Economic Development, Frankfort, Kentucky.

Anita P. Gallimore, Calloway County Treasurer, Murray, Kentucky.

Joyce Gordon, Director Human Resources, Murray State University, Murray, Kentucky.

LaDonna Hamontree, Library Assistant III, Pogue Special Collections and Archives, Murray State University, Murray, Kentucky.

Bob Hargrove, President and Chief Executive Officer, The Murray Bank, Murray, Kentucky.

Dr. Marcia Hobbs, Dean, School of Nursing and Health Professions, Murray State University, Murray, Kentucky.

Ashley Ireland, Dean University Libraries, Murray State University, Murray, Kentucky.

Dr. Robert Jackson, president, Murray State University Foundation, Murray, Kentucky.

Cary Jennings, Workforce Intelligence Branch, Frankfort Kentucky.

Stephanie Jennings, Assistant Director, General Accounting.

Ashely Jones, Acting Branch Manager, Kentucky Career Center, Frankfort Kentucky.

Sara Kaegi, Finance Officer, Murray Independent Schools, Murray, Kentucky.

Dr. Robert Lyons, Assistant Dean, College of Education and Human Services, Murray State University, Murray, Kentucky.

Heather Macha, Grants and Contract Manager, Murray State University, Murray, Kentucky.

Sally Mateja, Coordinator, Institutional review Board, Murray, Kentucky.

Sharon A. Melone, Executive Coordinator, Finance and Administrative Services, Murray State University, Murray, Kentucky.

Kathy Marshall, Kentucky Budget Office.

Jack Mazurak, Communications Director, Kentucky Cabinet for Economic Development, Frankfort, Kentucky.

Joy Mordica, Director of Data and Information, Council of Post-Secondary Education, Frankfort, Kentucky.

Dr. Jerry N. Muuka, Interim Dean, Arthur J. Bauernfeind, College of Business, Murray State University.

Gegett Manning

Hugh McCormick

Laura NeGron, Research Director, Tourism Arts and Heritage Cabinet, Frankfort, Kentucky.

Debbie Nesbitt, Administrative Secretary to Dean of Arthur J. Bauernfeind College of Business, Murray State University.

Amy Owns, Finance Officer, Calloway County Schools, Murray, Kentucky.

Jesse Perry, Graves County Judge Executive, Mayfield, Kentucky.

Dr. Bob Pervine, Associate Provost for Graduate Education and Research, Murray State University.

Dr. Gary Ransdell, President, Western Kentucky University, Bowling Green, Kentucky.

Tracy Roberts, Registrar, Murray State University, Murray, Kentucky.

Dr. Don E. Robertson, Vice President Student Affairs, Murray State University, Murray, Kentucky.

Dr. Jack Rose, Mayor, City of Murray.

Ed Ross, Controller, Kentucky Finance Cabinet, Frankfort, Kentucky.

Jason Royalty, Assistant Director, Reporting, Murray State University, Murray, Kentucky.

Stas Rzeznik, RIMS II Branch, Regional Product division, U.S. Bureau of Economic Analysis, Washington, D.C.

Dana Sheridan, Administrative Office, Personnel Supervisor, Calloway County Sheriff's Office, Murray, Kentucky.

Brad Schneider, Henderson County Judge Executive, Henderson, Kentucky.

Benjamin Stinnett, Interim Director of Retention Services, Murray State University, Murray, Kentucky.

Will Smodgrass, Director, Miller Memorial Golf Course, Murray State University, Murray, Kentucky.

Jennifer W. Smith, Coordinator of Student Services, Office of Enrollment Management, Murray State University.

Haley Stedelin, Manager of Employment and Compensation, Murray State University, Murray, Kentucky.

Dr. Staci Stone, Interim Dean, College of Humanities and Fine Arts, Murray State University, Murray, Kentucky.

Shelley Todd, Director, CFSB Center, Murray State University, Murray, Kentucky.

Dr. Tim Todd, Interim Provost and Vice President for Academic Affairs and Dean Arthur J. Bauerfeind College of Business, Murray State University, Murray, Kentucky.

Jim Townsend, Webster County Judge Executive, Providence, Kentucky.

Steve Tribble, Christian County Judge Executive, Hopkinsville, Kentucky.

Allen Ward, Athletics Director, Murray State University, Murray, Kentucky.

Wade White, Lyon County Judge Executive.

Misty Williams, Assistant Director of Alumni Affairs, Murray State University,
Murray, Kentucky.

Chris Wooldridge, District Director, West Kentucky District, Small Business
Development Center, Murray State University, Murray, Kentucky.

BIBLIOGRAPHY

- John Caffrey, Estimating the Impact of a College or University on the Local Economy, American Council on Education, Washington, D.C., 1971.
- Luke Crawford, Director of Finance, City of Murray, Audited Financial Statements, June 30, 2015.
- Commonwealth of Kentucky, Workforce Development Cabinet, and Kentucky Career Center, Frankfort, Kentucky.
- Executive Budget, 2014-2015 Executive Budget, Budget in Brief, Commonwealth of Kentucky, Ed Ross, Controller, Kentucky Economic Cabinet, Frankfort, Kentucky.
- Facilities Management Annual Inventory Reports, "Tax-Exempted Real Property for the Year Ended June 30, 2015."
- Anita Gallimore, Treasurer, Calloway County, Treasurer's Final Settlement, Fiscal Year Ending June 30, 2015.
- Gilbert Mathis, "The Economic Impact of Murray State University on Kentucky, West Kentucky, and Calloway County," Murray, Kentucky, October 2003.
- Murray State University Academic Bulletin, 2016-17. Murray State University Printing Services, Murray, Kentucky.
- Ed Ross, Kentucky Finance Cabinet, Frankfort, Kentucky.
- U.S. Department of Commerce, Bureau of Census, Population Division, Washington, D.C.
- Regional Multiplier, A User Handbook for the Regional Input-Output Modeling System (RIMS II) U.S. Department of Commerce, Bureau of Economic Analysis, Washington, D.C.
- Department of Commerce Bureau of Economic Analysis, RIMS II, Type II, July 2016.
- U.S. Department of Commerce Statistical Abstract of the U.S. 2014