DOCUMENT RESUME

ED 290 391 HE 021 082

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TITLE The Economic Impact of Public Universities and Colleges on Kentucky: Annual Expenditure Impact.
PUB DATE 30 Oct 87
NOTE 41p.; Paper presented at the Annual Conference of the Southern Association for Institutional Research and the Society for College and University Planning (New Orleans, LA, October 28-30, 1987).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Consumer Economics; *Economic Factors; Economic Research; Employment Level; *Expenditures; Financial Support; Higher Education; Income; *Public Colleges; School Community Relationship; *State Colleges; *State Universities
IDENTIFIERS *Economic Impact; *Kentucky

ABSTRACT

A study was conducted to generate an estimate of total expenditures and employment in the Kentucky economy in fiscal year (FY) 1985-86 due to the existence of public higher education. The direct economic impact attributable to public higher education includes expenditures generated by public institutions of higher education and affiliated corporations or foundations, by students attending these public institutions, and by visitors to the public institutions and affiliated corporations or foundations. An additional indirect expenditure impact is generated by the spending and re-spending by those receiving the funds. The spending also results in the creation of new jobs in the state. Data were collected by means of a mail survey of all public institutions of higher education in Kentucky. The colleges were asked to provide information about sources and uses of funds and the number of faculty, staff and students in FY 1985-86. Results included the following: (1) Kentucky's investment produced an expenditure impact of 2.4 times the initial investment; and (2) direct instate expenditures by institutions, students, and visitors due to the presence of public higher education in Kentucky created approximately 61,800 new jobs in the state. (KM)

THE ECONOMIC IMPACT OF PUBLIC UNIVERSITIES AND COLLEGES ON KENTUCKY

ANNUAL EXPENDITURE IMPACT

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SAIR-SCUP Conference
New Orleans, Louisiana

October 30, 1987

EXECUTIVE SUMMARY

This study, which focuses on the statewide economic impact of public higher education on Kentucky, adopts a conservative approach to provide an estimate of total expenditures and employment in the Kentucky economy in FY 1985/86 due to the existence of Kentucky's eight public universities and fourteen public community colleges. The direct economic impact attributable to public higher education institutions in Kentucky, as defined in this study, can be divided into:

(1) expenditures generated by public institutions of higher education and affiliated corporations or foundations,

(2) expenditures generated by students attending public institutions of higher education, and

(3) expenditures generated by visitors to the public institutions of higher education and affiliated corporations or foundations.

The economic impact of the Kentucky public institutions of higher education is defined in terms of annual cash expenditures generated by public higher education -- a flow concept. This definition of the short-term economic impact excludes the long-term economic impact of the returns on investment from the improvement in the stock of human and physical capitals in the state as a result of instruction, research, and public service at the public institutions of higher education. This longer-term impact is, in all likelihood, greater than the short-term expenditure impact estimates in this report. An analysis of the long-term expenditure impact of public higher education will be conducted at a later date.

The economic impact, as defined in this study, is larger than the initial injection of funds into the state economy. The spending and re-spending of the funds by individuals and businesses in Kentucky receiving the funds results in an additional "indirect" expenditure impact. The total expenditure impact is the sum of the initial or "direct" expenditure impact and the "indirect" expenditure impact. The spending of "new money" attributed to public higher education in Kentucky also results in the creation of new jobs in the state which are included in the economic impact.

A brief summary of the results of the study follows:

IN FY 1985/86, THE INVESTMENT OF $479 MILLION IN KENTUCKY GENERAL FUND REVENUES PRODUCED AN EXPENDITURE IMPACT OF $1.16 BILLION -- 2.4 TIMES THE INITIAL INVESTMENT. SEVENTY-SIX PERCENT OF THIS RETURN RESULTED FROM THE ATTRACTION OF NON-STATE TAX FUNDS THAT WOULD HAVE BEEN SPENT OUT-OF-STATE IN THE ABSENCE OF KENTUCKY PUBLIC HIGHER EDUCATION.

THE PAYBACK OF $2.4 FOR EACH $1.0 OF STATE TAX FUNDING OF PUBLIC HIGHER EDUCATION WOULD BE CONSIDERABLY GREATER IF THE LONG-TERM RETURNS OF INVESTMENT IN HUMAN AND PHYSICAL CAPITAL AND ECONOMIC DEVELOPMENT WERE INCLUDED.

THE DIRECT INSTATE EXPENDITURES OF $706 MILLION BY INSTITUTIONS, STUDENTS, AND VISITORS DUE TO THE PRESENCE OF PUBLIC HIGHER EDUCATION IN KENTUCKY RESULTED IN THE CREATION OF APPROXIMATELY 61,800 NEW JOBS IN KENTUCKY. OF THESE NEW JOBS, 22,600 WERE AT KENTUCKY INSTITUTIONS OF PUBLIC HIGHER EDUCATION.

IN FY 1985/86, KENTUCKY INSTITUTIONS OF PUBLIC HIGHER EDUCATION RECEIVED $987.3 MILLION IN REVENUE. OF THIS TOTAL, $479.2 MILLION (49%) WERE FROM KENTUCKY STATE TAX REVENUES AND $508.1 MILLION (51%) WERE FROM FEDERAL OR PRIVATE SOURCES.

IN FY 1985/86, DIRECT INSTATE EXPENDITURES BY KENTUCKY PUBLIC INSTITUTIONS OF HIGHER EDUCATION INCLUDED IN THE ECONOMIC IMPACT WERE $559.2 MILLION.

IN FY 1985/86, PURCHASES OF GOODS AND SERVICES FROM KENTUCKY BUSINESSES BY KENTUCKY PUBLIC INSTITUTIONS OF HIGHER EDUCATION RESULTED IN A TOTAL EXPENDITURE IMPACT OF $233.8 MILLION. THE TOTAL EXPENDITURE IMPACT IN KENTUCKY OF EMPLOYEES OF INSTITUTIONS OF PUBLIC HIGHER EDUCATION WAS $578.8 MILLION. THE IMPACT OF NEW CAPITAL CONSTRUCTION SPENDING IN KENTUCKY BY THE INSTITUTIONS WAS $52.4 MILLION.

IN FY 1985/86, $134.0 MILLION IN DIRECT EXPENDITURES WERE INJECTED INTO THE KENTUCKY ECONOMY BY THE 43,000 FULL-TIME STUDENTS WHO WOULD HAVE ATTENDED OUT-OF-STATE INSTITUTIONS OF HIGHER EDUCATION IN THE ABSENCE OF PUBLIC HIGHER EDUCATION IN KENTUCKY.

IN FY 1985/86, APPROXIMATELY 429,000 OUT-OF-STATE VISITORS TO KENTUCKY PUBLIC INSTITUTIONS OF HIGHER EDUCATION ACCOUNTED FOR $12.9 MILLION IN DIRECT INSTATE EXPENDITURES.

THE <u>TOTAL</u> EXPENDITURE IMPACT OF PUBLIC HIGHER EDUCATION IN KENTUCKY (DIRECT PLUS INDIRECT) WAS AS FOLLOWS:

	DIRECT EXPENDITURES ($ MILLIONS)	INDIRECT EXPENDITURES ($ MILLIONS)	TOTAL EXPENDITURES ($ MILLIONS)
INSTITUTIONS	$559.2	$307.4	$ 866.6
STUDENTS	$134.0	$137.9	$ 271.9
VISITORS	$ 12.9	$ 10.0	$ 22.9
TOTAL	$706.1	$455.3	$1,161.4

IN FY 1985/86, KENTUCKY INSTITUTIONS OF PUBLIC HIGHER EDUCATION EMPLOYED 37,464 FULL-TIME AND PART-TIME FACULTY, STAFF, AND STUDENTS, WHICH TRANSLATED INTO 22,630 FULL-TIME EQUIVALENT RESIDENT FACULTY, STAFF, AND STUDENTS.

IN FALL, 1985, THERE WERE 112,015 STUDENTS ENROLLED IN KENTUCKY PUBLIC INSTITUTIONS OF HIGHER EDUCATION. OF THESE, 71,300 (64%) WERE ENROLLED FULL-TIME. APPROXIMATELY 85 PERCENT OF THE FULL-TIME STUDENTS WERE KENTUCKY RESIDENTS.

INTRODUCTION

The annual investment of state general fund dollars in Kentucky's public institutions of higher education produces a significant short-term expenditure impact on Kentucky's economy. However, more importantly, this annual investment lays the groundwork for the long-term economic payoffs from instruction, research, and public service. Bowen (1977) found that the nonmonetary returns (long-term benefits) of higher education are "several times as valuable as the monetary returns (short-term benefits)." These benefits can be summarized as: 1) investment in human capital (development of knowledge and competence), and 2) improvement in the quality of life (individual and social development). They usually exist hand-in-hand with significant economic development.

Minshall (1985) reports that Kentucky will need to create over 350,000 new jobs by the year 2000, and 80 percent of those jobs will require employees to have at least two or more years of preparation beyond high school. This reality indicates that today education and its benefits are not "extras." They are necessary for survival -- the long-term economic benefits far outweigh the annual expenditures of public higher education.

PURPOSE OF THE STUDY

The purpose of this study is to describe the annual expenditure impact of public higher education on Kentucky by calculating the expenditure impact of public universities and colleges, faculty, staff, students, and visitors.

Accountability

Calculating an estimated economic impact of higher education expenditures is one way to be accountable for general fund revenues appropriated to public higher education, and to recognize the importance of other sources of revenues.

Statewide Perspective

This study complements local and regional economic impact studies previously published by various public universities in Kentucky.

Because of differences in study methodologies, it is not possible to combine their results to derive the statewide economic impact of public higher education. This study focuses on the statewide economic impact of public higher education on Kentucky.

IMPACT STUDIES IN THE LITERATURE

Most of the economic impact studies of higher education completed during the past two decades are based upon the work of John Caffrey and Herbert Isaacs (Caffrey and Isaacs, 1971). Their work is often referenced because it provides a simple methodology with examples using actual data and survey formats. The model provides a basis for estimating the local economic impact of an institution, students, and staff on businesses, governments, and households in the area served by that institution.

The Caffrey and Isaacs' methodology, however, is not appropriate for this study because we are concerned with the impact of expenditures associated with public higher education in the entire state, and not with the impact on a local community within the state. For example, expenditures financed by state tax dollars are treated as an injection of new funds into a local community, but represent a transfer of funds within the state in a statewide impact study.

A review of the literature has revealed only a few statewide economic impact studies. The studies that are most relevant for purposes of this report are briefly summarized in Appendix A.

STUDY METHODOLOGY

This study adopts a conservative approach to provide a well documented and replicable estimate of total expenditures and employment in the Kentucky economy due to the existence of Kentucky's eight public universities and fourteen public community colleges.

Care was taken at each step of the process to avoid double counting the expenditures of students and institutions. All expenditures are reported in millions of dollars unless otherwise stated.

When attempting to measure the expenditure impact of public higher education it is often difficult to separate the expenditures into a) those which displace other spending that would have taken place in the absence of the institutions, and b) those which represent a net increment in total spending due to the presence of the institutions in the state. Many impact studies are flawed by failing to account for this distinction and, as a consequence, grossly overstate the resulting expenditure impact.

The simple test used in this study to determine which expenditures in Kentucky should be included in the economic impact was based upon the question, "Would the expenditures have been made if Kentucky had no public institutions of higher education?" In other words, would the

expenditures have been made in another state if Kentucky had no public higher education? If the answer to this question is "yes," then the expenditures can be regarded as "new money" to Kentucky as a result of Kentucky's public higher education institutions. A term used to describe the attraction of "new money" into the state is exogenous spending, or spending from outside Kentucky.

The direct economic impact attributable to public institutions of higher education in Kentucky, as defined in this study, can be divided into:

(1) expenditures generated by the public institutions of higher education and their affiliated corporations or foundations,

(2) expenditures generated by students attending the public institutions of higher education, and

(3) expenditures generated by visitors to public institutions of higher education and their affiliated corporations or foundations.

The economic impact, defined in terms of cash expenditures generated in the economy, is a flow concept -- measured on an annual basis.

There is another aspect of the economic impact of the public institutions of higher education on the state that is more long-term in focus. It involves the improvement in the stock of human capital through instruction and public service, and in the stock of human and physical capital through research. As a result of the investment in public higher education, the earning capacities of individuals are increased, the returns to physical capital are increased, and there is general enhancement of the quality of life -- all of which provide a framework that is conducive to economic development in the state. This study did not attempt to address these important aspects of the investment in public higher education. It should be noted that this long-term economic impact is almost certainly substantially more important than the short-term expenditure impact.

The short-term economic impact, as defined in this study, is larger than the initial injection of funds into the state economy. Spending and re-spending of these funds by businesses and individuals to whom the initial expenditures were made by the institutions, students, and visitors, represent additional income. As they receive this "new income," a proportion is saved or spent out-of-state, and thus removed from the spending flow; however, a large proportion is spent again through demand for more goods and services which make up the successive rounds of spending on a diminishing scale -- at each stage, a proportion is withheld for savings or spent out-of-state, and thus diminishes the amount available for spending again in Kentucky. The total of these successive rounds of spending caused by the initial injection of "new money" into the state economy is termed the indirect economic impact attributable to the initial injection of new funds into the state economy.

When the initial injection of funds (the direct economic impact) is added to the resulting indirect economic impact, the result is the total economic impact, or total expenditures, resulting from the existence of public institutions of higher education in Kentucky. The total economic impact is some multiple of the initial direct economic impact. Sophisticated input-output models which describe the relationships between and among industries and households in the economy have been developed for each state by the U.S. Department of Commerce, Bureau of Economic Analysis (U.S. Department of Commerce, 1986). The input-output model can be used to derive a "multiplier" for the initial injection of funds into each of the major sectors of the state economy.

The multiplier measures the total (direct plus indirect) increase in expenditures or employment relative to the initial increase in exogenous expenditures generated by, in this case, the public institutions of higher education in Kentucky. For example, a multiplier of 2.0 for the business service sector means that for each $1 increase in expenditures directly associated with the purchases of business services by institutions of higher education, an additional $1 expenditure is generated in the Kentucky economy. It should be noted that this indirect (or multiplier) effect takes time to work its way through the state economy. The multiplier supplied by the input-output model represents the total of all successive rounds of spending, but it does not provide information about the length of time required to reach the total impact.

Economic impact has been defined thus far in the methodology in terms of expenditures or uses of funds by the public institutions of higher education and their associated activities. A basic difficulty in measuring the impact of expenditures by higher education is that a large proportion of the sources of funds and resulting employment by higher education originates from state taxes. To the extent that state taxes fund higher education, these expenditures represent a transfer of funds from Kentuckians and Kentucky businesses to public institutions of higher education.

Although institutions spend the funds provided them by state taxes, Kentuckians and Kentucky businesses supplying the funds through increased taxes will spend less. The reduction in spending by Kentuckians and Kentucky businesses as a result of increased taxes will be less than the corresponding increase in spending by the institutions. In this study, the assumption is made that if public institutions of higher education were eliminated, the proportion of state taxes used to fund them would also be eliminated -- the result would be a decrease in Kentucky taxpayer liability and a consequent increase in after-tax income. Part of this increase would be saved and part would be spent out-of-state, with the remainder being spent instate.

Leakages of income from the spending stream to savings and out-of-state spending mean that a reduction in state spending on higher education will not be fully matched by an increase in private spending. Conversely, an increase in state expenditures for higher

education financed by state taxes will not result in an equal decline in private spending. This provides the economic foundation for what is known as the "balanced budget" multiplier. In fact, under certain simplifying assumptions, it can be shown that an increase in state spending for higher education financed through an equal increase in state taxes (a balanced budget) will result in a "balanced budget" government multiplier equal to 1.0 (see. for example, Boyes, 1984).

The non-state tax funds flowing to public higher education in Kentucky are from such outside (exogenous) sources as the federal government, student tuition and fees, private grants, payments to affiliated corporations or foundations, and other non-state government sources. The expenditures resulting from this "new money" are subject to a larger multiplier effect than those financed by state or local taxes because they do not originate from a reduction in income for Kentucky residents.

Not only does the direct economic impact of spending by public institutions of higher education generate jobs at those institutions, but the additional spending in Kentucky's economy created by the initial impact creates additional jobs in the state economy. Employment multipliers, available from the input-output model, provide estimates of the increase in total employment, by sector, as a result of an increase in direct spending in each sector by public institutions of higher education.

Figure 1 represents the general methodology used in this study.

The estimation of the economic impact of public institutions of higher education and their affiliated corporations or foundations, students, and visitors to the institutions follows.

Direct Economic Impact of Institutions and Affiliated Corporations or Foundations

Expenditure Impact: Data collection forms were mailed to each of the public institutions of higher education in Kentucky. The institutions were asked to provide information about sources and uses of funds, and the number of faculty, staff, and students in FY 1985/86. Expenditures used to determine the direct economic impact were divided into four major expenditure categories:

(1) Purchases of goods and services,
(2) Wages and salary expenditures (including benefits),
(3) Payments to government, and
(4) Expenditures for new capital construction.

Expenditure categories which were excluded from the direct economic impact were:

(1) Transfers within or among public institutions,
(2) Debt service payments by institutions, and
(3) Grants/scholarships/loans to faculty or students at institutions.

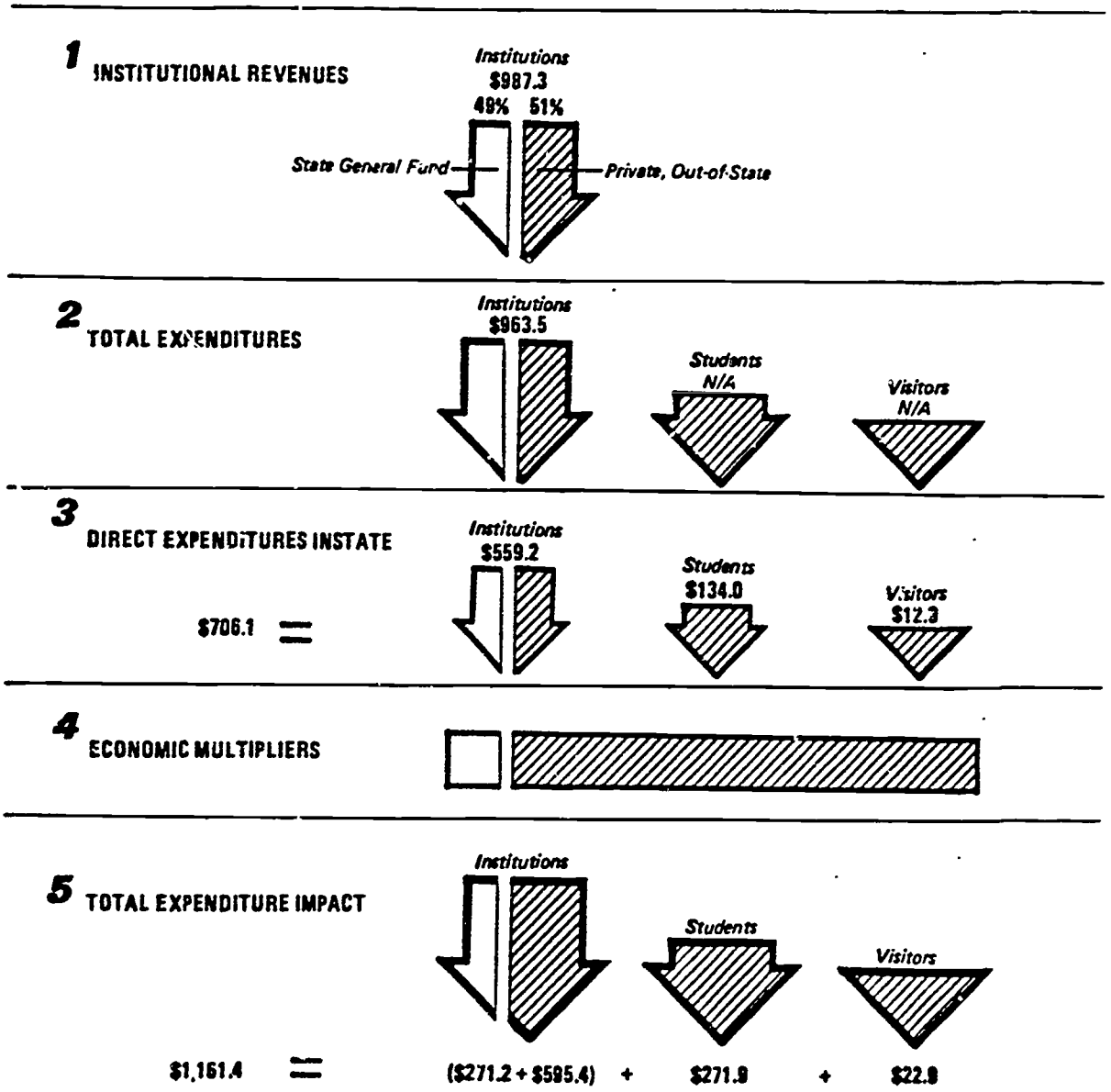

Figure 1 - EXPENDITURE IMPACT MODEL (In $Millions)

The exclusion of transfers includes debt service payments which represent repayment of prior spending for capital construction. Because capital construction expenditures are already included, inclusion of debt service payments would produce a double count. Grants/scholarships/loans are excluded to avoid double counting because they are included in student expenditures discussed later in this study.

To identify initial expenditures made directly into the Kentucky economy, the institutions were asked to separate instate and out-of-state purchases of goods and services by means of a zip code sort. They were also asked to estimate the proportion of capital construction expenditures which was made in another state. The capital construction expenditures were averaged over a five year period to account for the erratic timing of such expenditures.

Table 1 includes the expenditures (minus capital construction) of the institutions. Approximately 44 percent of all goods and services were purchased in Kentucky. Although not shown in Table 1, average capital construction expenditures for FY 1981/82 through FY 1985/86 were $36.8 million, 84 percent of which was spent in Kentucky.

TABLE 1

EXPENDITURES OF THE INSTITUTIONS IN FY 1985/86

Expenditure	Amount ($ millions)	% of Total
Goods and services	$346.5	36%
Kentucky	153.2	16
Out-of-state	193.3	20
Employees	$514.5	53%
Faculty	212.6	22
Staff	270.3	28
Students	31.6	3
State/local taxes & fees paid to government	$ 1.0	<1%
Internal transfers	$ 40.6	4%
Other *	$ 60.9	6%
Total	$963.5	100%

* Grants/scholarships/loans
Source: Kentucky Council Consolidated Current Funds Expenditures Budget Request Form BR-1B, 1987

Adjustments were made to employees' wages and salaries to reflect only those expenditures made directly in Kentucky. Only wages and salaries of resident faculty, staff, and student employees of the institutions were included -- a conservative approach -- because it can be argued that there will be some expenditures in Kentucky by those employees living in another state. Federal withholding, FICA, and federal

unemployment insurance were excluded because they represent out-of-state expenditures. These exclusions result in a measure of disposable personal income.

State and local taxes paid by residents and nonresidents are included because they represent expenditures in Kentucky. Both employer and employee contributions to retirement funds were excluded from wages and salaries for two reasons: (1) these funds are, for the most part, invested in U.S. government securities or in securities of firms located outside Kentucky, and (2) retirement funds represent savings, and as such, are not current expenditures, as defined in this study. This is a conservative assumption because a small proportion of these retirement funds are invested in Kentucky. It was assumed that employer and employee payments for health and life insurance represent current expenditures in Kentucky, and as such, are included in the direct economic impact of wages and salaries.

Table 2 presents the direct economic impact of public institutions of higher education as a result of the direct expenditures in Kentucky, as described above (see Appendix B).

TABLE 2

DIRECT EXPENDITURES IN KENTUCKY BY PUBLIC INSTITUTIONS IN FY 1985/86

Direct Expenditure	Amount ($ millions)
Goods and services	$153.2
Resident employee wages and salaries	319.0
Employee benefits*	25.1
State/local taxes paid by employees**	30.0
State/local taxes paid by institutions	1.0
Capital construction	30.9
Total	$559.2

* Largely contributions for health benefits.
** Income taxes and unemployment insurance.

Treating contributions to retirement funds as a measure of employee saving, the portion of wages and salaries, net of federal taxes and savings, available for spending in Kentucky ($319.0 million) was distributed in broad categories using 1986 personal consumption expenditure data from the Survey of Current Business (U.S. Department of Commerce, August, 1987). These data are available only at the national level and, therefore, represent an approximation of the actual distribution of expenditures in Kentucky. Table 3 contains the distribution of the new wages and salaries by broad categories.

TABLE 3

TRIBUTION OF WAGES AND SALARIES

Expenditure	Amount ($ millions)	Percent of Total
Housing and food	$146.7	46%
Personal goods/services	70.2	22
Transportation	47.9	15
Other	54.2	17
Total	$319.0	100%

THE DIRECT EXPENDITURES OF EMPLOYEES ATTRIBUTABLE TO PUBLIC HIGHER EDUCATION WAS $319.0 MILLION.

The results of several studies (Kentucky and other states) regarding spending by category vary widely and preclude any attempt to take a simple average of each expenditure category for use in this study (Appendix C).

Employment Impact: In FY 1985/86, the public universities and colleges employed 37,464 faculty, staff, and students. The numbers of employees who were full-time and part-time, resident and nonresident, faculty, staff, and students are given in Table 4.

A more meaningful measure of employment is obtained when part-time employees are converted to full-time equivalent (FTE) employees. The number of resident FTE employees was calculated using salary data reported by the institutions by a) dividing the part-time resident employees' net wages/salaries by the average full-time resident employee's net wage/salary, and b) adding the result to the number of full-time resident employees.

Part-time resident employees were converted to FTE employees, as shown in Table 5.

IN FY 1985/86, THERE WERE 22,630 FULL-TIME EQUIVALENT (FTE) RESIDENT EMPLOYEES (19,200 FULL-TIME AND 3,430 PART-TIME FTE'S) AT KENTUCKY INSTITUTIONS OF HIGHER EDUCATION.

TABLE 4

EMPLOYEES IN PUBLIC INSTITUTIONS OF HIGHER EDUCATION

Employee Classification		Number
Faculty		7,266
Full-time Employee	5,475	
Resident	5,260	
Nonresident	215	
Part-time Employee	1,791	
Resident	1,659	
Nonresident	132	
Staff		16,061
Full-time Employee	13,904	
Resident	13,507	
Nonresident	397	
Part-time Employee	2,157	
Resident	2,097	
Nonresident	60	
Students		14,137
Full-time Employee	519	
Resident	433	
Nonresident	86	
Part-time Employee	13,618	
Resident	12,069	
Nonresident	1,549	
Total		37,464

TABLE 5

FULL-TIME EQUIVALENT PART-TIME RESIDENT EMPLOYEES

Employee	Number	Total Part-time Wage/salary	Average Full-time Wage/salary	Total Part-time FTE
Faculty	1,659	$ 6,866,357	$22,440	306
Staff	2.097	$12,202,623	$11,567	1,055
Students	12,069	$23,931,905	$11,567*	2,069
Total	15,825			3,430

* Average full-time staff salaries were used to obtain the student FTE's.

Source of Funds to Institutions: It is important to identify the sources of funds to public higher education institutions in Kentucky because the indirect impact of spending financed by state taxes is different from that of spending financed by other sources. Because it is impossible to separate institutional expenditures financed by state government revenues from those financed by other sources, a method was adopted that approximates the division of revenues.

The revenue sources of the institutions were divided into a) those from state taxes, and b) those from other sources. The proportion of the revenues provided by state government was applied to institutional expenditures to determine that portion of the direct economic impact which would be subject to the "balanced budget" government multiplier of 1.0. The remainder of the expenditures was subject to the full expenditure multiplier effect using sector multipliers taken from the RIMS II input-output model for Kentucky (U.S. Department of Commerce, 1986).

Of their total FY 1985/86 revenues, $479.2 million (49%) were from Kentucky tax dollars and $508.1 million (51%) were from other sources. The revenues are distributed by source, as presented in Table 6.

DURING FY 1985/86, PUBLIC INSTITUTIONS OF HIGHER EDUCATION RECEIVED $987.3 MILLION IN REVENUE FROM ALL SOURCES.

Direct Economic Impact of Students Attending Public Institutions of Higher Education

In fall, 1985, 112,015 students were enrolled in Kentucky public colleges and universities. Sixty-four percent -- 71,282 students -- were enrolled full-time. Approximately 85 percent of the full-time students included in the study were Kentucky residents (Appendix D).

Enrollments and student demographic data for fall, 1985 were obtained from the Kentucky Council on Higher Education's comprehensive data base and the U.S. Bureau of the Census' 1980 microdata tape (U.S. Department of Commerce, 1983). Information about the percent of students who were married or lived in university housing, available from the microdata tape, was included in the analysis of student expenditures.

TABLE 6

DISTRIBUTION OF INSTITUTIONAL REVENUE BY SOURCE
FY 1985/86

Source		Percent Total
State Taxes		49%
	Government appropriations	45
	Government grants/contracts	3
	Indirect cost reimbursement	<1
	Fringe benefits appropriated to another agency	1
Private/federal/out-of-state		51%
	Tuition and fees	10
	Government appropriations	2
	Government grants/contracts	7
	Gifts/grants/contracts	3
	Indirect cost reimbursement	<1
	Investment income	1
	Endowment income	1
	Sales/services of education activities	2
	Budget fund balance/support	2
	Sales/services of auxiliaries	8
	Sales/services of hospitals	11
	Other	4
Total		100%

Average student expenditures were taken from estimates provided by each institution for Getting In (Kentucky Higher Education Assistance Authority, 1984). Existing surveys of student expenditures were not used due to the wide disparity in the numbers, as mentioned earlier.

It was assumed that students who attended a Kentucky community college and then went on to complete their education at four-year universities in Kentucky were equivalent to full-time four-year students. Based upon the results of a transfer study completed by the Kentucky Council on Higher Education (Kentucky Council, 1987), it was estimated that approximately 24 percent of full-time Kentucky community college students continue their education at public universities in Kentucky. Therefore, of the 10,314 full-time community college students enrolled, 2,602 were included in the student expenditure impact. The remaining 7,712 students were not included under the assumption that, in the

absence of higher education in Kentucky, they would not have attended college outside the Commonwealth.

The total student expenditures in each expenditure category were estimated by multiplying the average expenditure in each category at each university or college by the number of students in each category. It is important to note that expenditures for room and board and books and supplies for full-time students living in university housing were not included because they are a source of revenue to universities and colleges and, therefore, are reflected in expenditures by institutions. Tuition and fees for all students also were not included since they are a source of revenue to -- and hence are reflected in expenditures by -- institutions.

All nonresident students' expenditures were included in the economic impact because they represent expenditures from sources outside the state. It was much more difficult to determine the amount of "new" resident student spending in Kentucky attributed to the existence of public higher education institutions. The question, "Would these student expenditures have been made if Kentucky had no public higher education institutions?" had to be answered affirmatively in order for these expenditures to be included in this study. Using this rule, spending by part-time resident students was not included because it was assumed that these students would not have attended college in another state if there had been no public higher education institutions in Kentucky; they would have remained in Kentucky, employed full-time.

To estimate the number of full-time Kentucky resident students who would have attended universities or colleges in another state if public higher education institutions were not available in Kentucky, a rough approximation was used incorporating information from the American College Testing (ACT) corporation's assessment (American College Testing Corporation, 1986).

Students who indicated that they preferred to attend college in another state in response to at least one of the five choices given were counted as expressing a desire to attend a university or college out-of-state if higher education were not available in Kentucky. This approximation may overstate the expected behavior of Kentucky students if the out-of-state choice was the fourth or fifth choice. On the other hand, the approximation understates expected student behavior to the extent that many Kentucky students may not take the time to indicate preference for higher education in another state. Student response would, of course, be different if Kentucky had no institutions of public higher education, and the students had to pursue a higher education in another state.

Based upon the method described above, the ACT information revealed that approximately 66 percent of Kentucky's enrolled freshmen expressed some desire to attend college in another state (ACT, 1986). After taking all of these adjustments into account, the number of full-time resident students having an economic impact on Kentucky was reduced by 34 percent. This reduction reflects the assumption that 34 percent of full-time resident students would not have pursued a higher education

in another state in the absence of public higher education in Kentucky. The number of full-time resident and nonresident students whose expenditures were included in the impact study was 42,938.

The institutions reported a wide range of expenditures among different types of students (Kentucky Higher Education Assistance Authority, 1985). To take these differences into account, students were grouped as a) undergraduate/graduate/law, or b) medicine and dentistry. Within these two groups, they were further divided into a) married, or b) not married. Because 66 percent of the full-time resident student expenditures in Kentucky would be lost to institutions in other states if there were no public higher education in Kentucky, the expenditures represent "new" or exogenous spending in Kentucky as a result of Kentucky public higher education.

The $154.1 million of full-time student expenditures includes spending by students employed by the institutions of public higher education. The wages and salaries of these students have already been included in the direct economic impact of the institutions. To avoid double counting, the wages and salaries of those students who were nonresidents of Kentucky and employed by the institutions ($3.2 million) must be deducted from the student expenditure impact. In addition, 66 percent of resident student employees' wages and salaries of $16.9 million (.66 x $25.7 million) -- representing expenditures by those who would have enrolled in out-of-state universities or colleges -- must also be deducted. Thus, to avoid double counting, the total student expenditure figure of $154.1 million must be reduced by $20.1 million resulting in a total student expenditure impact of $134.0 million. Table 7 presents the distribution of student expenditures (excluding students employed at the institutions).

TABLE 7

STUDENT EXPENDITURES IN KENTUCKY

Expenditure	Amount	Percent Total
Housing and food	$ 84.4	63%
Personal goods/services	29.5	22
Transportation	20.1	15
Total	$134.0	100%

THE TOTAL DIRECT ECONOMIC IMPACT OF STUDENTS ATTENDING KENTUCKY PUBLIC INSTITUTIONS OF HIGHER EDUCATION IN FY 1985/86 WAS $134.0 MILLION.

Direct Economic Impact of Visitors Attending Higher Education Institutions and Affiliated Corporations or Foundations

The number of estimated visitors reported by the institutions to the Council on Higher Education were, in most cases, rough estimates. Because there was such a wide range among these estimates, the visitor expenditure calculations may either understate or overstate the impact of visitor spending in Kentucky. The average expenditure of daytime and overnight visitors to Kentucky was $30 (Kentucky Department of Travel Development, 1987). Only expenditures by visitors from other states were included in the study.

IN FY 1985/86, THE INSTITUTIONS REPORTED TO THE KENTUCKY COUNCIL ON HIGHER EDUCATION THAT THEY ATTRACTED AN ESTIMATED 429,000 VISITORS FROM OTHER STATES. THESE VISITORS SPENT $12.9 MILLION IN KENTUCKY.

RESULTS

Total Expenditure Impact of Public Higher Education on Kentucky

The total expenditures (by category) attributable to public higher education in Kentucky in FY 1985/86 are listed in Table 8. The proportion of direct expenditures by the institutions funded from state tax dollars (49%) received a balanced budget multiplier of 1.00; the remainder of their direct expenditures from non-state tax sources (51%) was subject to larger expenditure multipliers which varied by business/industry sector. The estimates of direct student expenditures ($134.0 million) and the direct expenditures of nonresident visitors ($12.9 million) represent "new" (exogenous) funds injected into the Kentucky economy as a result of public higher education. Thus, the "new" expenditures are subject to an expenditure multiplier greater than 1.00. Sectoral multipliers used in the study ranged from a low of 1.56 to a high of 2.36. These multipliers were obtained from the U.S. Department of Commerce RIMS II Input-Output Model for Kentucky. A statewide multiplier of 1.78 supplied by the Kentucky Department of Travel Development was used as a multiplier for visitor expenditures (Kentucky Department of Travel Development, 1987). Each expenditure (output) multiplier represents the additional expenditure (output) attributed to an additional dollar of direct expenditure (output) delivered to final demand in that sector.

Table 8 presents the total expenditure impact of public higher education in Kentucky.

THE TOTAL EXPENDITURE IMPACT OF PUBLIC HIGHER EDUCATION ON KENTUCKY WAS $1.16 BILLION IN FY 1985/86.

In FY 1985/86, the state invested $479.2 million in public higher education from general fund revenues. This investment resulted in a total short-term expenditure impact of $1.16 billion which was 2.4 times the initial investment. This payback from Kentucky's investment in public higher education was due to the attraction of private and federal funds to the state institutions which accounted for an

TABLE 8

TOTAL EXPENDITURE IMPACT OF PUBLIC HIGHER EDUCATION
(in $ millions)*

	(A) Total Direct Impact	(B) Amount Financed by State Taxes[1]	(C) Non-State Financed Portion[2]	(D) Indirect Impact[3]	(E) Total Expenditure Impact[4]
All Institutions.....	$559.2	$271.2	$288.0	$307.4	$866.6
Goods and services	153.2	74.3	78.9	80.6	233.8
Employees wages and salaries	319.0	154.8	164.2	176.0	495.0
Employees benefits	25.1	12.0	13.0	13.8	38.8
State/local taxes by employees	30.0	14.6	15.4	15.0	45.0
State/local taxes and fees by institutions	1.0	0.5	0.5	0.4	1.4
Capital construction	30.9	15.0	15.9	21.5	52.4
Students 134.0		—	134.0	137.9	271.9
Visitors	12.9	—	12.9	10.0	22.9
Total.....$706.1		$271.2	$434.9	$455.3	$1,161.4

1 49% of direct expenditures subject to balanced budget multiplier of 1.0.
2 51% of direct expenditures subject to expenditure multipliers.
3 Resulting from applying expenditure multipliers to Column (C). (See Appendix B (1))
4 Column (B) + Column (C) + Column (D).
* Due to rounding, Column (E) institutional categories do not add to institutional total.

expenditure impact of $595.4 million, or 51 percent of the total expenditure impact of $1.16 billion. Expenditures by students who would otherwise have pursued a higher education outside the state, and visitors from outside the state, accounted for an additional expenditure impact of $294.8 million, or 25 percent of the total expenditure impact. Thus, 76 percent of the total expenditure impact of public higher education in Kentucky can be directly attributed to spending from non-state sources.

Total Employment Impact of Public Higher Education on Kentucky

Table 9 shows the total number of Kentuckians employed due to public higher education in Kentucky. These total employment estimates are based upon the direct expenditure impact resulting from the presence of public higher education in Kentucky. They are computed using information about the increase in the number of employees (in thousands) resulting from a $1 million increase in direct expenditures (to final demand) of public higher education by sector in Kentucky. These "employment multipliers" were provided by the U.S. Department of Commerce, RIMS II input-output model for Kentucky (Appendix E).

Table 9 shows that the direct injection of $706.1 million in "new money" into the Kentucky economy in FY 1985/86 resulted in the creation of 39,200 jobs in Kentucky, largely outside of public higher education. Thus, in total, public higher education in Kentucky accounted directly for approximately 22,600 FTE jobs at the institutions and indirectly for 39,200 jobs elsewhere in Kentucky.

TABLE 9

KENTUCKIANS EMPLOYED DUE TO EXPENDITURE IMPACT

Expenditure Type	Direct Expenditure Impact ($ millions)	Additional Employment Generated
Institutions.....	$559.2	30,170
Goods and services	153.2	7,239
Wages and salaries	319.0	18,677
Benefits*	25.1	997
Employee state/local taxes	30.0	1,814
Institutions state/ local taxes/fees	1.0	58
Capital construction	30.9	1,385
Students.....	$134.0	8,239
Visitors.....	$ 12.9	810
Total.....	$706.1	39,219

* Primarily health contributions

In total, direct spending that was attributable to public higher education in Kentucky accounted for 61,800 jobs in the Kentucky economy in FY 1985/86.

IN ADDITION TO THE 22,600 FTE EMPLOYEES AT THE PUBLIC INSTITUTIONS, ANOTHER 39,200 JOBS IN KENTUCKY WERE DIRECTLY ATTRIBUTABLE TO THE DIRECT EXPENDITURES BY THE INSTITUTIONS, STUDENTS, AND VISITORS.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

In 1985/86, public higher education in Kentucky made a significant economic contribution to the Commonwealth. An investment in public higher education of $479.2 million from the state general fund paid off with a total expenditure impact that was 2.4 times the initial investment -- $1.16 billion. This return on the initial investment by state government would almost certainly be far greater if the long-term economic impact of higher education -- improving Kentucky's stock of human and physical capital, and economic development -- were included.

This payback from Kentucky's initial investment in public higher education resulted from attraction of private and federal funds to the institutions, which accounted for an expenditure impact of $595.4 million (51%) of the total expenditure impact of $1.16 billion. Expenditures by students who would otherwise have pursued a higher education outside the state, and visitors from outside the state, accounted for an additional expenditure impact of $294.8 million (25%) of the total expenditure impact. Thus, 76 percent of the total expenditure impact of public higher education in Kentucky can be directly attributed to spending from non-state tax sources which would have been spent out-of-state in the absence of Kentucky public higher education.

In FY 1985/86, purchases of goods and services from Kentucky businesses by Kentucky public institutions of higher education resulted in a total expenditure impact of $233.8 million. The total expenditure impact in Kentucky of employees at institutions of public higher education was $578.8 million. The total impact of new capital construction spending in Kentucky by institutions was $52.4 million.

The 43,300 full-time resident and nonresident students who would have enrolled in higher education outside Kentucky in the absence of public institutions of higher education increased total spending within the state by $271.9 million. Finally, visitors from out-of-state had an estimated expenditure impact of $22.9 million.

In FY 1985/86, public higher education in Kentucky resulted in 22,600 FTE employees at public institutions and 39,200 additional jobs elsewhere in Kentucky. In total for FY 1985/86, approximately 61,800 jobs in Kentucky were accounted for by the economic impact of public higher education.

Recommendations

It is recommended that:

- This study be extended in the future to include Part II which would address the long-term economic impact of state government's investment in public higher education.
- The study methodology be refined and that the study be replicated within two years.
- Better data definitions and uniform collection procedures (surveys) be developed.
- The study results be disseminated to Kentucky's decision makers, policy setters, and citizens through various news media and direct mailings.

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APPENDIX A

Annotated Bibliography of Selected Studies

Public University System Impact Studies

There are few statewide impact studies in the literature. Georgia Tech, Brown University, Louisiana State University, and the University of Wisconsin-Madison, among the major public and private universities, have viewed their institutions from a local and statewide perspective.

The Impact of Georgia Tech: Money, People, Ideas, by Shaeffer and Biven in 1978 looked at the impact of Georgia Tech on the state's money, people, and idea flows. The people flow was estimated from the results of an extensive alumni survey. The idea flow was estimated from a survey about educational and research activities. The two most important contributions of this study were that 1) multipliers obtained from a state economic model were used to trace spending patterns among Georgia industries, and 2) out-of-state revenues were identified and used to calculate exogenous revenues.

The Economic Impact of Brown University on the City of Providence and on the State of Rhode Island, by Gina S. McEnany in 1979 measured the short-range impact of the university on its local community and the state. The study was an update of a 1976 study with the same title by Hooten and Bromberg. It estimated the economic impact of Brown University on local businesses , local and state governments, and local and state populations. The study used the Caffrey and Isaacs expenditure categories. Similar to the Georgia Tech model, it accounted for exogenous revenues. The study excluded part-time students from the expenditure figures and reported separate expenditures for undergraduate and graduate students. Multipliers were derived using the Caffrey-Isaacs methodology.

The Economic Impact of Louisiana State University System on the Louisiana Economy was presented to the 1980 Association for Institutional Research forum in Atlanta, Georgia by Engler, Firnberg and Kuhn. The methodology consisted of a multiple regression model based on ten years of university and state data. The purpose of the research was to establish an econometric model to predict economic impact using enrollments, salary expenditures, and capital construction expenditures. The importance of this research lies in its attempt to estimate long-term benefits using short-term data. It was a departure from the traditional multiplier method. The methodology used gross measures of economic and educational health to arrive at enrollment, salary, and capital construction multipliers for LSU in relation to the state.

The University of Wisconsin-Madison and the Local and State Economies: A Second Look, by Rosen, Strang, and Kramer in 1985 used an input-output model. Revenue sources were identified by source and

type. Extensive surveys helped to assure the reliability of the data. Multipliers were selected from a neighboring county's economic profile. The study provided a long-term estimation of economic benefits from the results of a survey of alumni earnings. The researchers suggested that visitors and medical centers required separate impact methodologies.

Independent Institution Impact Studies

Coordinated statewide independent universities' studies of economic impacts were the first step to statewide studies. Cooperative institutional studies were vitally important to independent institutions. The financial survival of many independent institutions depended upon their perceived worth to the state or region. Therefore, independent institution studies were among the first conducted.

One of the earlier studies was The Impact of Private Colleges and Universities on the Economy of the State of Missouri by Macy and Gustafson in 1968. The focus of the study was college and student expenditures and employment by the institutions. Data were from surveys of thirty-five independent institutions. The results were compiled for resident and nonresident students; they exhibited a substantial impact on Missouri's economy. Tax savings to residents were mentioned as a benefit. A multiplier (2.9) was adopted from an out-of-region study and applied to the expenditures. Two points were important in this study: 1) tax savings were mentioned as a benefit, and 2) independent institutions were the leading employers in Missouri.

Trubac, Dugan, and Murray in Economic Impact: Study of Independent Higher Education in Indiana (1975) reported the influence of thirty-two independent institutions during 1972-73. Approximately one-half of the students enrolled in Indiana independent institutions were from other states. It was assumed that all of the faculty, staff, and institutional expenditures were made in Indiana. Multipliers were selected from those suggested by Caffrey and Isaacs. Adjusted total expenditures represented "new monies" to the state from outside sources. Similar to the Missouri study, an attempt was made to measure the effects of exogenous revenues.

The Economic Impact of Independent Higher Education in New York by Gay and Weintraut in 1978 focused on the impact of New York's 106 independent institutions. The number of employees, size of annual payroll, level of revenues, and expenditures, and net export value of activities were estimated. Revenues exceeded $2 billion, of which 30 percent were from sources in the state. One-fourth of the revenues were from federal/private grants and donations. As suggested by Caffrey and Isaacs, an expenditure multiplier of 2.0 was used with deductions made for tax levies and other public support. The authors concluded that independent higher education in New York reduced the overall cost of higher education to the state.

The Economic Impact of Independent Colleges and Universities on Massachusetts in 1979-80 and 1980-81, by Lawrence Olson in 1981 was an

update of a previous year's study. One important procedure was that the employment projections were based on independent institution employment. Enrollment increases were cited as the reason for 10,000 new jobs. In conclusion, the authors emphasized that a significant amount of tax monies did not have to be spent because of the extensive independent institutions.

Public Institution Economic Impact Studies

Public education studies offer comparisons of economic impacts over which the public has some control through financial support. There have been several statewide studies by higher education systems. Community college systems conducted some of the earlier statewide studies about economic impact. They were soon joined by senior institution systems.

The Economic Impact of the Virginia Community College System from 1966 to 1974 by Norval Wellsfry in 1976 was an application of the Caffrey and Isaacs model. Wellsfry added two concepts to his study that had been missing from many of the earlier ones in the literature: 1) a time series measurement of the economy was used to determine the actual effect that community colleges had on the economic health of the state. A specific period was identified when Virginia did not have state-supported community colleges, and the researcher used the data to determine the difference community colleges made with regard to the economic growth of the state, and 2) the study stressed the importance of removing state tax dollars from the revenue sources and only counting "new monies" to the state.

A Study of the Economic Impact of Six Community Colleges in Illinois by Bess, Lach, and Wellman for the Illinois Community College Board in 1980 estimated the economic impact on its district economy. The study limited data collection to full-time faculty, staff, and students. Part-time college personnel were converted to full-time equivalent (FTE) personnel.

Oregon Community College Economic Impact Study: A Guidebook edited by Mary Kinnick reported the procedure used in conducting a 1981/82 economic impact study of thirteen Oregon community colleges and two branch campuses. Subsequent suggestions for conducting a statewide study included: a) involvement of college presidents; b) perceived need for information from the legislature; c) appointment of local study coordinators at each institution; d) completion of the study at a fixed time; e) availability of central computer processing and research support; and f) use of an external consultant. The study also questioned the appropriateness of the Caffrey-Isaacs model.

A Study of the Economic Impact of Spending by Students in Arizona Universities by Ashton and Huff in 1982 examined the economic impact of resident and nonresident university students on the state. The study omitted institutional expenditures from the analysis and emphasized the impact of nonresident students. Multipliers from an Arizona econometric model were used to calculate the indirect impact of

students. The authors stated that statewide multipliers were usually higher than community-specific multipliers because of the broader statewide economic base.

Higher Education's Economic Impact in Arkansas by Robert L. Kennedy in 1985 investigated the direct and indirect economic influences of the state's nine public universities. Emphasis was placed on the impact that the universities had on the business climate of the state. In particular, it was noted that employment caused by the expenditures of the universities and its faculty, staff, and students equated to eight jobs for every ten students enrolled. For each person employed by the universities, three jobs were created in the economy. Educational services, research services, and public events were difficult to measure.

State Higher Education Agency Impact Studies

Studies conducted by state higher education agencies are rare. Erwin and Miller in their Analysis of State-Level Studies of the Economic Impact of Higher Education (1982) identified twenty-seven statewide studies, of which only five were conducted by state agencies.

The literature contained five statewide studies sponsored by state higher education agencies. The earliest of these studies was conducted by Czamanski and Lande for the Ohio Board of Regents in 1975. The Impact of Higher Education Capital Improvements Program on Ohio Communities predicted the impact that capital improvement appropriations would have on the communities that had public higher education institutions. From these regional figures, the researchers estimated the statewide economic impact. Specific sector multipliers (e.g., income, investment, and employment) were used. Rather than focus on one multiplier for each sector, the study presented low and high estimates. Data were taken from available published reports. Separate profiles were drawn for each community with public higher education institutions.

The Vermont State Commission on Higher Education published The Economic Importance of Higher Education in Vermont (1976 - 77) by James Conkl>. It included the state's twenty-two public and private colleges and universities. The study focused on the contributions of higher education to employment, physical assets, revenues from outside Vermont, and economic growth. The colleges and universities were provided an economic impact model and each institution conducted its own study. A steering committee was formed to oversee the process and economic impact coordinators were selected at each institution. Although the data were consolidated and some analyses were done, a majority of the report consisted of individual college and university data.

Robert Greenwood and others with the Pennsylvania Economy League, Incorporated conducted a study of Pennsylvania higher education for the Pennsylvania State Board of Education and the Pennsylvania Higher Education Assistance Agency in 1981. Higher Education and the

Economy: The Statewide Impacts provided information on the economic returns of dollars invested in ninety-nine of 125 public and private higher education institutions. As a result of this study, several suggestions about statewide studies were made: a) the purpose must be clearly understood by all parties; b) key leadership has to be involved; c) an impartial research team is needed because of the inexact process of economic impact studies; d) direct comparisons between institutions and types of institutions should be avoided; and e) committees should be used for general and technical advice.

The Wealth of Knowledge: Higher Education's Impact on the California Economy by the California Postsecondary Education Commission reported the results of a Caffrey-Issacs model application for 1981-1982. Each sector of public and independent higher education conducted studies of their institutions which were then reported to the Commission. The focus of the final report was on three areas. 1) Direct economic impacts of the institutions, 2) impact on human capital development, and 3) impact on personal and social development. Multipliers were chosen by each higher education sector. Each study estimated the additional resources drawn from other than state funds. State totals were accomplished by adding the reported impacts.

Higher Education's Monetary and Non-Monetary Impact on Maryland's Economy by the Maryland State Board for Higher Education in February 1987 estimated the statewide long-term and short-term economic impacts of higher education. The study included public and independent colleges and universities that received public funding. Short-term economic impacts were estimated using the Caffrey-Isaacs model. Long-term impacts were described as comparisons of labor participation rates with the years of school completed. Unemployment rates were generally lower, median income and expected lifetime earnings were higher, and potential tax contributions were higher for those with more schooling.

EXPENDITURE IMPACT

(1) TOTAL EXPENDITURES IN KENTUCKY	(2)	(3) DIRECT EXPENDITURES	(4) STATE TAXES MULTIPLIER	(5) OUT OF STATE OR PRIVATE MULTIPLIER *	(6) STATE TAXES IMPACT (.49(3)) x (4)	(7) OUT OF STATE OR PRIVATE IMPACT (.51(3)) x (5)	(8) TOTAL IMPACT (6)+(7)
UNIVERSITY EXPENDITURES GOODS AND SERVICES	PERCENT OF EXPEND **	$153.2			374.3	$159.5	$233.8
UTILITIES/FUELS	16.7%	$25.6	1.00	1.93	12.4	25.4	37.8
MAINTENANCE/REPAIRS	10.4%	15.9	1.00	2.36	7.7	19.3	27.0
MISCELLANEOUS SERVICES	8.3%	12.7	1.00	2.24	6.2	14.7	20.8
TELECOMMUNICATIONS	3.1%	4.7	1.00	1.56	2.3	3.8	6.0
COMPUTER SERVICES	3.0%	4.6	1.00	1.97	2.2	4.6	6.8
ITEMS FOR RESALE	9.6%	14.7	1.00	1.94	7.1	14.6	21.7
SUPPLIES	18.6%	28.6	1.00	1.98	13.9	29.1	43.0
COMMODITIES	1.2%	1.8	1.00	1.98	0.9	1.8	2.7
TRAVEL/EXPENSE	3.8%	5.8	1.00	2.18	2.8	6.5	9.3
OTHER OPERATING	6.6%	10.1	1.00	1.98	4.9	10.3	15.2
FURNITURE/OFFICE	3.1%	4.7	1.00	1.98	2.3	4.8	7.1
MACHINERY/IMPLEMENTS	3.3%	5.0	1.00	1.98	2.4	5.1	7.5
INSTRUMENTS/APPLIANCES	3.7%	5.7	1.00	1.98	2.8	5.8	8.6
MOTOR VEHICLES	0.4%	0.7	1.00	1.98	0.3	0.7	1.0
BUILDING/EQUIPMENT	2.6%	3.9	1.00	1.98	1.9	4.0	5.9
LIBRARY BOOKS	2.6%	4.0	1.00	1.98	1.9	4.1	6.0
OTHER CAPITAL OUTLAY	2.6%	4.0	1.00	1.98	1.9	4.1	6.0
LEASE PURCHASE	0.5%	0.7	1.00	1.98	0.4	0.8	1.1
EMPLOYEE WAGES AND SALARIES***	% EXPEND	319.0			154.8	340.2	495.0
HOUSING AND FOOD	46.0%	146.7	1.00	1.98	71.2	149.5	220.8
PERSONAL GOODS/SERVICES	22.0%	70.2	1.00	2.07	34.1	74.8	108.8
TRANSPORTATION	15.0%	47.9	1.00	2.18	23.2	53.7	76.9
OTHER	17.0%	54.2	1.00	2.23	26.3	62.2	88.6
STATE/LOCAL TAXES PAID BY EMPLOYEE		30.0			14.6	30.5	45.0
STATE WITHHOLDING		21.5	1.00	1.97	10.4	21.8	32.2
LOCAL PAYROLL TAX		8.6	1.00	1.97	4.2	8.7	12.9
BENEFITS PAID BY EMPLOYEE		8.0			3.7	8.3	12.0
HEALTH INSURANCE		6.6	1.00	2.11	3.2	7.1	10.3
LIFE INSURANCE		1.1	1.00	2.11	0.5	1.2	1.7
BENEFITS PAID BY UNIV		17.1			8.3	18.5	26.8
HEALTH INSURANCE		12.9	1.00	2.11	6.3	14.0	20.3
LIFE INSURANCE		2.1	1.00	2.11	1.0	2.3	3.3
OTHER		2.1	1.00	1.97	1.0	2.2	3.2
STATE/LOCAL TAXES & FEES PAID BY UNIV		1.0			0.5	1.0	1.4
PERSONAL PROPERTY		0.4	1.00	1.97	0.2	0.4	0.6
REAL PROPERTY		0.3	1.00	1.97	0.1	0.3	0.4
UTILITIES		0.2	1.00	1.97	0.1	0.2	0.3
OTHER		0.1	1.00	1.97	0.0	0.1	0.1
UNIV CAPITAL CONSTRUCTION		30.9	1.00	2.36	15.0	37.5	52.4
TOTAL UNIVERSITY EXPENDITURES IN KY		559.2			271.2	595.4	866.6
STUDENTS	% EXPEND	134.0				271.9	271.9
HOUSING AND FOOD	63.0%	84.4		1.98		167.1	167.1
PERSONAL GOODS/SERVICES	22.0%	29.5		2.07		61.0	61.0
TRANSPORTATION	15.0%	20.1		2.18		43.8	43.8
OUT OF STATE VISITORS		12.9		1.78		22.9	22.9
TOTAL		$706.0			$271.2	$890.2	$1,161.4

* SOURCE: MULTIPLIERS FOR KENTUCKY (RIMS II), U.S. DEPARTMENT OF COMMERCE, MAY, 1986
** SOURCE: 1986/88 BRANCH BUDGET, FORM #103, OPERATING BUDGET REQUEST

NOTE: DUE TO ROUNDING, SUBTOTALS MAY NOT SUM TO TOTALS.

EXPENDITURE DISTRIBUTION OF STAFF (Faculty, and Staff) AND STUDENTS

	Murray State University 1985 - 86		Western Ky University 1977 - 78		University of Wisconsin 1983 - 84		Georgia Tech 1976 - 77	Central Florida 1985 - 86	
	Percent		Percent		Percent		Percent	Percent	
	Staff	Student	Staff	Student	Staff	Student	Staff Student	Staff	Student
Housing	20.5	13.3	26.7	22.5	15.4	24.5	14.5	32.2	22.7
Maint of Housing	3.4	1.8	3.5	0.4	4.4	0.7			
Utilities	10.3	7.0			6.4	8.7		6.3	7.3
Food	17.9	19.1	8.7	11.4	12.4	12.1	18.3	13.0	12.4
Clothes	3.4	6.3	7.6	7.5	3.9	5.0	7.9	2.4	4.5
Health Care	4.4	4.7	11.6	9.4	3.0	4.0		1.0	
Insurance	8.0	5.3	7.2	0.0	3.2	1.7		4.6	5.2
Taxes			4.9	0.7	9.2	4.4		1.9	
Other Services	2.4	3.1	2.4	2.4	3.6	2.3	14.0	11.1	3.7
Durable Goods	2.6	1.5	1.0	0.5	3.8	0.8		4.3	3.9
Non-Durable Goods	4.1	6.7	4.2	7.5	8.3	10.9	2.0	4.6	5.9
Recreation	5.8	15.0	8.1	25.9	5.0	10.5	10.5	6.3	14.1
Gifts/Donations	7.0	4.5	8.5	4.5	2.7	1.6			
Transportation	10.2	11.6	5.5	7.3	18.7	11.7	32.8	12.2	20.4

SOURCES: Mathis, Gilbert L. "Overview of the Impact of Murray State University on West Kentucky." 1986, pp. 50-64.
Morgan, J. Michael. "The Economic Impact of Western Kentucky University on the Bowling Green- Warren County Economy." 1978, pp. 25-50.
Rosen, Mark I. and Others. "The University of Wisconsin-Madison and the Local and State Economies: A Second Look." 1985, pp. 24-32
Schaffer, William A. and Biven, W. Carl. "The Impact of Georgia Tech: Money, People, Ideas." 1978, pp. 25-34
McHone, W. Warren. "The Impact of Higher Education on the Central Florida Economy." 1986, pp. 6-10

Appendix D

COSTS OF EDUCATION (NOT UNIVERSITY TUITION/FEES, ROOM AND BOARD, OR BOOKS AND SUPPLIES)
ESTIMATED STUDENT EXPENDITURES
TAKEN FROM "GETTING IN 1985-86," KHEAA

1980 CENSUS MICRODATA -- % STUDENTS MARRIED	31.4%
1980 CENSUS MICRODATA -- % MARRIED STUDENTS NOT IN UNIV HOUSING	75.0%(EST)
1980 CENSUS MICRODATA -- % OF THOSE NOT MARRIED WHO WERE NOT IN UNIV HOUSING ..	69.6%
1985/86 ACT TAPE -- FT KY FRESHMEN WHO PREFERRED TO ENROLL IN ANOTHER STATE	65.5%

FULL-TIME STUDENTS	EKU	KSU	MOSU	MUSU	NKU	UK	UKCCS*	UL	WKU	TOTAL
UNDERGRAD/GRAD/LAW**	9,751	1,118	4,146	5,569	4,623	15,667	10,314	10,695	8,110	69,993
KY RESIDENT	8,403	777	3,294	3,911	3,748	13,342	2,409	9,759	7,118	52,761
OUT OF STATE	1,348	341	852	1,658	875	2,325	193	936	992	9,520
MEDICINE/DENTISTRY						544		745		1,289
KY RESIDENT						488		683		1,171
OUT OF STATE						56		62		118
TOTAL FT STUDENTS	9,751	1,118	4,146	5,569	4,623	16,211	2,602	11,440	8,110	63,570
KY RESIDENT	8,403	777	3,294	3,911	3,748	13,830	2,409	10,442	7,118	53,932
OUT OF STATE	1,348	341	852	1,658	875	2,381	193	998	992	9,638
% TRANSFER TO PUBLIC UNIV							24%			

UNDERGRADUATE/GRADUATE/LAW

	EKU	KSU	MOSU	MUSU	NKU	UK	UKCCS	UL	WKU	TOTAL
	9,751	1,118	4,146	5,569	4,623	15,667	2,602	10,695	8,110	62,281
NOT MARRIED	3,272	406	1,437	2,015	1,590	5,283	640	3,499	2,700	TOTAL 21,045
ROOM/BOARD	$2,036	$1,930	$2,100	$1,810	$1,100	$2,600	$2,009	$2,225	$2,270	WT AVG $2,128
BOOKS/SUPPLIES										
PERSONAL	500	600	576	600	500	332	550	693	600	$516
TRANSPORTATION	100	200	100	356	700	268	272	252	200	$256
OTHER										
MARRIED	1,614	200	709	994	784	2,606	290	1,726	1,332	TOTAL 10,253
ROOM/BOARD ***	$5,097	$4,832	$5,257	$4,531	$2,754	$4,558	$4,785	$5,570	$5,683	WT AVG $4,879
BOOKS/SUPPLIES										
PERSONAL ***	1,252	1,502	1,442	1,502	1,252	863	1296	1,055	1,502	$1,196
TRANSPORTATION ***	250	501	250	891	1,752	1,401	907	1,712	501	$1,022
OTHER										

MEDICINE AND DENTISTRY						544		745		TOTAL 1,289
NOT MARRIED						179		243		TOTAL 423
ROOM/BOARD						$4,100		$4,150		WT AVG $4,129
BOOKS/SUPPLIES										
PERSONAL						1,575		1,341		$1,440
TRANSPORTATION						900		1,008		$962
OTHER										
MARRIED						88		120		TOTAL 208
ROOM/BOARD						$6,50'		$5,570		WT AVG $5,967
BOOKS/SUPPLIES										
PERSONAL						2,29c		1,517		$1,848
TRANSPORTATION						1,163		1,712		$1,479
OTHER										
FT STUDENTS NOT IN UNIV HOUSING	4,885	606	2,146	3,008	2,374	8,156		5,588	4,031	TOTAL 30,794
ROOM/BOARD										
BOOKS/SUPPLIES										97.8
PERSONAL										
TRANSPORTATION										24.1
OTHER										16.6
FT IN UNIV HOUSING	1,967	244	864	1,211	956	3,176		2,104	1,623	TOTAL 12,144
ROOM/BOARD										
BOOKS/SUPPLIES										
PERSONAL	$748	$898	$862	$898	$748	$550		$851	$898	WT AVG $760
TRANSPORTATION	$150	$299	$150	$533	$1,048	$654		$767	$299	$520
OTHER										
GRANDTOTAL										$154.1
MINUS STUDENT EMPLOYEES' WAGES/SALARIES (100% OF NONRESIDENTS AND 66% OF RESIDENTS)										20.1
GRANDTOTAL (ADJUSTED)										$134.0

* ONLY STUDENTS EXPECTED TO TRANSFER TO KY PUBLIC UNIV AFTER COMPLETING AN ASSOCIATE DEGREE ARE INCLUDED
** INCLUDES HOUSE STAFF AND POST-DOCTORAL STUDENTS
*** ALL INST EXCEPT UK BASED UPON UL'S RATIO OF MARRIED/NOT MARRIED STUDENT EXPENSES; UK'S DISTRIBUTION OF EXPENSES BASED UPON UL'S DISTRIBUTION

APPENDIX D METHODOLOGY

STEP 1 Separate into (A) undergrad/grad/law, and (B) medicine/dentistry

STEP 2 For (A) and (B), calculate the number of resident students (66%) who would have gone out-of-state and add all nonresident students = (C)

STEP 3 Separate (C) into (D) married, and (E) not married

STEP 4 For (D) and (E), calculate the number of students not in university housing = (F)

STEP 5 Multiply the number of students (F) remaining in the analysis by the weighted average expenditures = (G)

STEP 6 Calculate the number of students in university housing (include all nonresidents and 66% or of the residents) = (H)

STEP 7 Multiply (H) by the weighted average expenditures = (I)

STEP 8 Sum (I) and (G) for total expenditures = (J)

EMPLOYMENT IMPACT

(1)	(2)	(3)	(4)	(5)
			EMPLOYMENT	
TOTAL EXPENDITURES IN KENTUCKY		DIRECT EXPENDITURES	MULTIPLIER *	# OF JOBS (3)x(4)
UNIVERSITY EXPENDITURES				
GOODS AND SERVICES	PERCENT OF EXPEND **	$153.2		7,239
UTILITIES/FUELS	16.7%	$25.6	15.3	391
MAINTENANCE/REPAIRS	10.4%	15.9	50.7	806
MISCELLANEOUS SERVICES	8.3%	12.7	44.7	569
TELECOMMUNICATIONS	3.1%	4.7	20.7	97
COMPUTER SERVICES	3.0%	4.6	60.4	275
ITEMS FOR RESALE	9.6%	14.7	38.6	566
SUPPLIES	18.6%	28.6	62.1	1,774
COMMODITIES	1.2%	1.8	62.1	112
TRAVEL/EXPENSE	3.8%	5.8	40.1	233
OTHER OPERATING	6.6%	10.1	62.1	627
FURNITURE/OFFICE	3.1%	4.7	62.1	294
MACHINERY/IMPLEMENTS	3.2%	5.0	62.1	310
INSTRUMENTS/APPLIANCES	3.7%	5.7	62.1	356
MOTOR VEHICLES	0.4%	0.7	62.1	43
BUILDING/EQUIPMENT	2.6%	3.9	62.1	244
LIBRARY BOOKS	2.6%	4.0	62.1	248
OTHER CAPITAL OUTLAY	2.6%	4.0	62.1	248
LEASE PURCHASE	0.5%	0.7	52.1	40
EMPLOYEE WAGES AND SALARIES***	% EXPEND	319.0		18,677
HOUSING AND FOOD	46.0%	146.7	62.1	9,113
PERSONAL GOODS/SERVICES	22.0%	70.2	74.4	5,221
TRANSPORTATION	15.0%	47.9	40.1	1,919
OTHER	17.0%	54.2	44.7	2,424
STATE/LOCAL TAXES PAID BY EMPLOYEE		30.0		1,814
STATE WITHHOLDING		21.5	60.4	1,296
LOCAL PAYROLL TAX		8.6	60.4	519
BENEFITS PAID BY EMPLOYEE		8.0		293
HEALTH INSURANCE		6.6	38.3	251
LIFE INSURANCE		1.1	38.3	42
BENEFITS PAID BY UNIV		17.1		704
HEALTH INSURANCE		12.9	38.3	494
LIFE INSURA		2.1	38.3	81
OTHER		2.1	60.4	129
STATE/LOCAL TAXES & FEES PAID BY UNIV		1.0		56
PERSONAL PROPERTY		0.4	60.4	24
REAL PROPERT		0.3	60.4	16
UTILITIES		0.2	60.4	14
OTHER		0.1	60.4	5
UNIV CAPITAL CONSTRUCTION		30.9	44.9	1,385
TOTAL UNIVERSITY EXPENDITURES IN KY		559.2		30,170
STUDENTS	% EXPEND	134.0		8,239
HOUSING AND FOOD	63.0%	84.4	62.1	5,241
PERSONAL GOODS/SERVICES	22.0%	29.5	74.4	2,193
TRANSPORTATION	15.0%	20.1	40.1	806
OUT OF STATE VISITORS		12.9	62.9	810
TOTAL		$706.0		39,219

* SOURCE: MULTIPLIERS FOR KENTUCKY (RIMS II), U.S. DEPARTMENT OF COMMERCE, MAY, 1986
** SOURCE: 1986/88 BRANCH BUDGET, FORM #103, OPERATING BUDGET REQUEST

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