AN ECONOMIC INPUT-OUTPUT ANALYSIS FOR MISSISSIPPI-ALABAMA COASTAL COUNTIES
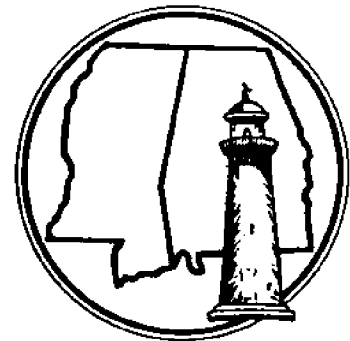
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**MISSISSIPPI-ALABAMA
SEA GRANT PROGRAM**

AN ECONOMIC INPUT-OUTPUT ANALYSIS FOR
MISSISSIPPI-ALABAMA COASTAL COUNTIES

by

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November, 1978

PREFACE

The theoretical and computational developments were undertaken jointly by researchers at the Bureau of Business Research at the University of Southern Mississippi and the Department of Agricultural Economics and Rural Sociology at Auburn University.

Any errors of fact, logic, or judgment in the report are the responsibility of the authors.

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I. INTRODUCTION

There is no doubt that in this country we face a severe problem of environmental decay as well as a problem of controlling such decay. Economists in general attribute excessive pollution of the environment to the failure of the market. Our competitive economic system distributes resources in a manner that may or may not be desirable. The market's failure to allocate prices to all economic resources can be viewed as its critical short-coming. Many resources such as air or water are publicly owned and therefore, in the process of private production, are considered as free goods. There are no economical or social charges to the users of the environment. In a nutshell, this is perhaps the major cause of degradation of the environment. Economic research can be used to aid in control of environmental degradation.

A theoretical and operational framework for linking the economic structure and its environmental repercussions was used by Wassily Leontief [7] incorporating environment pollution into an input-output scheme. He shows how to deal in a concrete manner with some basic economic questions about alternatives. Many economists have adopted these techniques with some modification to allow for the specific problems encountered in their studies or regions. Laurent and Hite [6] and Blaylock and Jones [2] make such attempts. Many more can be quoted.

A common feature of these studies is their reliance on an input-output approach, and in general each study is subdivided into three major areas:

(1) Development of an input-output model of the region,

(2) Identification and quantification in physical units of the individual waste residues from the various production sectors of the region,

(3) Linkage of the economic and environmental portions.

Researchers at the Bureau of Business Research at the University of Southern Mississippi and the Department of Agricultural Economics and Rural Sociology at Auburn University are each conducting studies for the coastal regions of Mississippi and Alabama, following broadly the outline indicated.

Through an intention of cooperation between the two groups, it is attempted that the two separate models be combined to reflect the whole coastal region of Mississippi and Alabama as a single unit.

This region encompasses the following counties of Mississippi: Hancock, Harrison, and Jackson, and the following counties of Alabama: Mobile and Baldwin. As a coastal unit the five counties have experienced a fast rate of increase in population, currently estimated at 700,000 people.

This report discusses the combined input-output model for the Mississippi-Alabama coastal region as the first step in this endeavor. A general overview of procedures used is discussed in the sequel. A more detailed analysis of techniques, methodology and sources of data are given in the respective studies of Mississippi and Alabama models [11] & [4]. Readers interested in a more thorough background should refer to those reports.

II.   THEORETICAL DISCUSSION OF INPUT-OUTPUT MODEL

An input-output model describes the economic activities of a region in an accounting framework. The model has three main features.

(1) Transactions Matrix

(2) Technical Coefficients Matrix

(3) Interdependence Matrix

A brief discussion of each follows.

Transactions Matrix

A diagram showing the basic interindustry relationship is given in Figure 1.

FIGURE 1

Transactions Matrix

From \ To		Purchasing Sectors $I \ldots \ldots j \ldots \ldots N$	Final Demand	Total Gross Output
Producing Sectors	I	$X_{11} \ldots \ldots X_{ij} \ldots \ldots X_{in}$	D_1	X_1
	.	.	.	.
	.	.	.	.
	i	$X_{11} \ldots \ldots X_{ij} \ldots \ldots X_{in}$	D_i	X_i
	.	.	.	.
	.	.	.	.
	N	$X_{n1} \ldots \ldots X_{nj} \ldots \ldots X_{nn}$	D_n	X_n
	.			
Value Added		$V_1 \ldots \ldots V_j \ldots \ldots V_n$		
Total Input		$X_1 \ldots \ldots X_j \ldots \ldots X_n$		

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Summing across rows,

$$(1) \quad X_i = \sum_{j=1}^{n} X_{ij} + D_i.$$

Summing down columns,

$$(2) \quad X_j = \sum_{i=1}^{n} X_{ij} + V_j,$$

Since,

$$\sum_{i=1}^{n} X_i = \sum_{j=1}^{n} X_j,$$

This implies that:

$$\sum_{i=1}^{n} \sum_{j=1}^{n} X_{ij} + \sum_{i=1}^{n} D_i = \sum_{j=1}^{n} \sum_{i=1}^{n} X_{ij} + \sum_{j=1}^{n} V_j$$

where:

X_{ij} = total sales of sector i to sector j,

X_i = gross output of industry i in dollars,

X_j = total input of industry j in dollars,

$\sum_{j=1}^{n} X_{ij}$ = total intermediate sales of industry i to processing sectors,

$\sum_{i=1}^{n} X_{ij}$ = total intermediate purchases of industry j from processing sectors,

D_i = total of final demand for industry i,

V_j = value added (final purchases) from industry j.

For example, the first row of the table shows the sales of Sector I to the other sectors. The final demand column describes the total sales of the producers to each sector of the economy which consumes the commodities supplied by the producing sectors but does not contribute to the economy a product of its own. Final demand sectors include households, government, sales on capital accounts and exports. Column entries represent the total purchases of a sector from the other sectors. In addition to the contribution of the N producing sectors to the production of each sector, a sector called "value added,"which supplies primary input products such as labor, government services as reflected by tax payments, depreciation and imports, is added to each column.

Technical Coefficient Matrix

A second set of relationships which assumes fixed technical coefficients can be expressed as:

$$X_{ij} = a_{ij} X_j .$$

Here it is presumed that inputs into each sector are directly proportional to the level of output of that sector.

The technical coefficients a_{ij} which can be obtained as:

$$a_{ij} = \frac{X_{ij}}{X_j} ,$$

are usually displayed in a tabular form as shown in Figure 2.

FIGURE 2

Technical Coefficients Matrix

To From		I . . . . j . . . . N
		Purchasing Sectors
Producing Sectors	I . . . i . . . N	a_{11} . . . . a_{1j} . . . . a_{1n} a_{i1} . . . . a_{ij} . . . . a_{in} a_{n1} . . . . a_{nj} . . . . a_{nn}

This matrix can be considered to describe technological relationships among sectors, in essence, the production functions of the sectors.

The columns can be explained as follows: In order to produce one unit of some commodity, inputs of other commodities are required. That means that the production of each unit of the jth commodity will require

i of the other commodity. For instance, $a_{32} = 19$ means that 19¢ worth
of the product of industry II is required as an input for producing a
dollar's worth of output in industry III.

The sum of the elements in each column of the technical coefficients
matrix must be less than one. Thus, each column sum represents the
partial input cost (not including the value added) incurred in producing
a dollar's worth of the commodity produced by the industry represented
by that column. That is:

$$\sum_{i=1}^{n} a_{ij} < 1 \qquad (j=1,2,\ldots,n).$$

From this then:

$$V_j = 1 - \sum_{i=1}^{n} a_{ij},$$

is the payment to the "value added" sector.

An input-output model with a structure such that $\sum_{i=1}^{n} a_{ij} < 1$ is called
an open model. It is a model which contains an endogenous section, made
up of direct-producing sectors, and an exogenous section, made up of
"Final Purchases" sectors. If all sectors are included in the endogenous
section, the system is called closed.

Interdependence Coefficients Matrix

Expansion of system of equations (1) yields:

$$X_1 = a_{11} X_1 + a_{12} X_2 + \ldots\ldots + a_{1n} X_n + D_1$$
$$X_2 = a_{21} X_1 + a_{22} X_2 + \ldots\ldots + a_{2n} X_n + D_2$$
$$\vdots \qquad \vdots \qquad \vdots \qquad\qquad \vdots \qquad \vdots$$
$$X_n = a_{n1} X_1 + a_{n2} X_2 + \ldots\ldots + a_{nn} X_n + D_n$$

which is equivalent to:

$$X_1 - a_{11}X_1 - a_{12}X_2 - \ldots\ldots - a_{1n}X_n = D_1$$
$$X_2 - a_{21}X_1 - a_{22}X_2 - \ldots\ldots - a_{2n}X_n = D_2$$

(3)

$$X_n - a_{n1}X_1 - a_{n2}X_2 - \ldots\ldots - a_{nn}X_n = D_n.$$

In compact matrix form system of equations (3) is:

(4) $X - AX = D$

where:

   X = Column vector of gross outputs with n elements,
   D = Column vector of final demand with n elements,
   A = NXN matrix of direct input coefficients.

Factoring X in (4), yields:

(5) $X(I-A) = D$,

and solving for X, the result is:

$$X = (I - A)^{-1} D.$$

Here gross output is expressed as a function of final demand. The entries in the inverse matrix $(I-A)^{-1}$ are called the interdependency coefficients. These elements are constant values.

Denote the elements of $(I-A)^{-1}$ by $[A_{ij}]$. That is:

$$(I-A)^{-1} = \left[A_{ij}\right] = \begin{bmatrix} A_{11} & A_{12} & \ldots\ldots\ldots A_{1n} \\ A_{21} & A_{22} & \ldots\ldots\ldots A_{2n} \\ & \cdot\ \cdot\ \cdot\ \cdot\ \cdot\ \cdot \\ A_{n1} & A_{n2} & \ldots\ldots\ldots A_{nn} \end{bmatrix}.$$

The values A_{ij} represent the direct and indirect requirements of sector i per unit of final demand for the output of sector j. When i=j, for instance A_{22}, then a change in the final demand for sector II will affect the output X_2 of sector II directly and indirectly. When i≠j, for instance A_{23}, then output X_2 of sector II is affected indirectly by the

final demand D_3 of sector III. In this case sector III will have to

alter its output to provide the necessary inputs to the other producing

sectors. These sectors will then alter their production to satisfy the

change in the final demand D_3 of sector III.

A more detailed discussion of a theoretical description of an input-

output model may be found in Leontief[8] , Miernyk [9], Isard [5], and

Richardson [12].

Assumptions of Input-Output Analysis

The following assumptions are necessary:

(1) Each sector produces a single identical product.
(2) The technical coefficients a_{ij} are fixed over time.
(3) The production function which describes the physical
    nature of production is linearly homogeneous which
    implies that a k-fold increase or decrease in input
    will result in a k-fold increase or decrease in output,
    respectively.
(4) Errors of aggregation of industries into sectors are
    minimal.

It can be seen that these postulates are very restrictive and

unrealistic; thus, it becomes necessary to abandon some of them if any

serious work in the area of input-output is desired.

III. REGIONALIZATION OF THE
NATIONAL INPUT-OUTPUT MODEL

The method of constructing the input-output model of the Mississippi-
Alabama Coastal Region follows a procedure that is widely employed by
regional economists. It is a non-survey technique which uses the direct
input coefficients of the national model, itself obtained by direct
survey techniques. The national input coefficients are then adjusted to
fit the region under study, using secondary data sources. Adcock and
Waldman [1] and Morrison and Smith [10] reported evidence that non-survey
techniques do in fact provide a fair approximation to the economic struc-
ture of the regions observed in their studies.

The following steps summarize the techniques and approaches used.

(1) The 83 sectors of the national input-output tables for
1971 [13] were aggregated into 27 sectors. Of these,
26 are the producing sectors while the 27th represents
the primary input sector, the value added, using a rou-
tine developed by Curtis [3]. Table 1 shows the aggre-
gation of national sectors scheme corresponding to the
regional sectors.

(2) The aggregated national technical coefficients were
scaled by the combined location quotient of each
sector of the Mississippi-Alabama Coastal Region as
follows:

Let: LQ_j = Location quotient of sector j

N_j^{R1} = Employment in sector j in Mississippi Coastal Region

N_j^{R2} = Employment in sector j in Alabama Coastal Region

N^{R1} = Total Mississippi regional employment

N^{R2} = Total Alabama regional employment

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TABLE 1

AGGREGATION OF 83 SECTORS
NATIONAL INPUT-OUTPUT MODEL
INTO 27 REGIONAL SECTORS --
MISSISSIPPI-ALABAMA COASTAL COUNTIES

Regional Sector No.	Description	Corresponding National Sectors
1	Fishery	3
2	Forestry	
3	Livestock	1
4	Crops	2
5	Ag., For., Fish. Services	4
6	Mining	5, 6, 7, 8, 9, 10
7	Construction	11, 12
8	Food Processing	14
9	Apparel & Textiles	18, 19
10	Lumber & Wood	20, 21
11	Paper & Allied	24, 25
12	Printing & Publishing	26
13	Chemicals & Allied	27, 28, 29, 30, 31
14	Stone, Clay & Glass	35, 36
15	Primary & Fabric Metals	37, 38, 39, 40, 41, 42
16	Transportation Equipment	59, 60, 61
17	Other Manufacturing	13, 15, 16, 17, 22, 23, 32 33, 33, 34, 43, 44, 45, 46, 47, 48
18	Water Transportation	65
19	Other Transportation	
20	Communications & Util.	66, 67, 68
21	Whlsl. & Retail Trade	69
22	Finance, Ins., & Real Estate	70, 71
23	Hotel, Pers. & Repair Serv.	72
24	Medical, Educ. & Non prof.	76
25	Other Services	73, 74, 75
26	State & Local Government	78
27	Final Purchases	77, 79, 80, 81, 82, 83

N_j = National employment in sector j

N = Total national employment

Then:

$$LQ_j = \frac{\dfrac{N_j^{R_1}}{N^{R_1}}}{\dfrac{N_j}{N}} \cdot \frac{N_j^{R_1}}{N_j^{R_1} + N_j^{R_2}} + \frac{\dfrac{N_j^{R_2}}{N^{R_2}}}{\dfrac{N_j}{N}} \cdot \frac{N_j^{R_2}}{N_j^{R_1} + N_j^{R_2}}$$

(6)
$$= \frac{\dfrac{\left[N_j^{R_1}\right]^2}{N^{R_1}} + \dfrac{\left[N_j^{R_2}\right]^2}{N^{R_2}}}{\dfrac{N_j}{N}\left[N_j^{R_1} + N_j^{R_2}\right]} \cdot$$

When employment data were not available, the corresponding output data were used.

If:

$LQ_j = 1$ implies that the region is self sufficient in sector j.

$LQ_j < 1$ implies that the region is less than self sufficient in sector j, and it is an indication that inputs from other regions are necessary.

$LQ_j > 1$ implies that the region is more than self sufficient.

For the purpose of this study, when $LQ_j > 1$, the assumption is made that regional requirements of sector j are satisfied and location quotient is set equal to 1.00. Table 2 shows the values of the location quotients on an individual and combined basis.

Applying the location quotients to the national technical coefficients yields an adjusted direct requirements table, the adjustments being the scaling of the national technical coefficients to reflect more accurately the regional industrial structure.

TABLE 2

LOCATION QUOTIENTS

Sector	Mississippi Location Quotient*	Alabama Location Quotient**	Combined Mississippi-Alabama Location Quotient***
Forestry and Fishery	21.44	13.80	17.37
Livestock	.31	.48	.44
Crops	.13	1.30	1.24
Agriculture, For., Fish. Services	1.49	.75	1.01
Mining	.24	1.92	1.07
Construction	1.15	1.29	1.23
Food Processing	.97	.88	.93
Apparel and Textiles	.45	.90	.77
Lumber and Wood	.75	2.31	1.98
Paper and Allied	2.00	7.49	6.51
Printing and Publishing	.26	.57	.49
Chemicals and Allied	1.17	1.83	1.60
Stone, Clay and Glass	.67	.62	.64
Primary and Fabric Materials	.42	.32	.39
Transportation Equipment	8.62	1.06	7.63
Other Manufacturing	.12	.21	.18
Water and Other Transportation	1.77	1.62	1.65
Communications and Util.	1.10	1.16	1.13
Wholesale and Retail Trade	.83	1.13	1.02
Finance, Ins., Real Estate	.66	.89	.80
Hotel, Pers. and Repr. Service	2.43	1.20	1.73
Medical, Education and Nonprof.	.37	.99	.86
Other Services	1.02	1.01	1.02
State and Local Government	1.35	.88	1.11

* Source [1]
** Source [4]
*** Source Equation (6)

(3)   Monetary gross outputs of the 26 producing sectors
of the Mississippi-Alabama coastal region are ob-
tained from the individual input-output studies ,
respectively, [11], [4] as shown in Table 3. These
totals are then multiplied by the regionalized
technical coefficients to produce the estimated
entries of the transaction table.

TABLE 3

GROSS OUTPUT TOTALS OF 26
PRODUCING SECTORS OF THE
MISSISSIPPI–ALABAMA COASTAL REGION
1972 Data

Producing Sector	Gross Output Mississippi Coastal Region* (Thousand Dollars)	Gross Output Alabama Coastal Region** (Thousand Dollars)	Total Output Mississippi–Alabama Coastal Region (Thousand Dollars)
1. Fisheries	11,900	17,728	29,628
2. Forestry	7,900	4,837	12,737
3. Livestock	4,160	15,912	20,072
4. Crops	1,582	29,749	31,331
5. Ag., For., Fish Services	1,667	3,030	4,697
6. Mining	9,458	36,516	45,974
7. Construction	119,400	304,386	423,786
8. Food Processing	99,838	68,300	168,138
9. Apparel and Textiles	9,915	46,327	56,242
10. Lumber and Wood	15,659	58,800	74,459
11. Paper and Allied	81,038	356,374	437,412
12. Printing and Publishing	6,003	19,400	25,403
13. Chemicals and Allied	211,228	281,100	492,328
14. Stone, Clay and Glass	17,392	31,300	48,692
15. Primary and Fab. Metals	55,284	11,000	66,284
16. Transportation Equipment	523,622	85,900	609,522
17. Other Manufacturing	28,622	141,500	170,122
18. Water Transportation	25,070	118,439	143,509
19. Other Transportation	32,850	106,298	139,148
20. Communication and Utilities	121,867	154,701	276,568
21. Whlsl. and Retail Trade	239,006	419,738	658,744
22. Finance, Ins., Real Estate	110,900	357,722	468,622
23. Hotel, Pers. and Repr. Serv.	29,067	47,010	76,077
24. Medical, Educ. and Nonprof.	73,676	129,255	202,901
25. Other Services	93,499	148,255	241,724
26. State and Local Government	141,417	267,243	408,660
TOTAL	2,072,020	3,260,760	5,332,780

*Source: [11]
**Source: [4]

IV. MISSISSIPPI-ALABAMA
COASTAL REGION
INPUT-OUTPUT MODEL

The study area consists of the five coastal counties of Mississippi and Alabama. They are Hancock, Harrison and Jackson in Mississippi and Mobile and Baldwin in Alabama.

The input-output model is arranged with 26 endogenous producing sectors. A detailed description of the composition of each sector is given in Appendix Table A.

The theoretical basis as well as the techniques of regionalization procedures adopted in the construction of this model is outlined in Sections II and III.

Briefly, the model shows in what amounts the commodities or services a sector produces are actually absorbed by all other sectors in the region. It can also show the types of goods and services and their amounts which a particular sector received from all others. The year 1972 was chosen as the base year due to the fact that secondary data on the county level were more practically available than for any other recent year.

As stated in Section II, an input-output model consists of three basic parts. These include the transaction matrix, the technical coefficients matrix, and the interdependence matrix. These three elements as well as their application in analyzing economic characteristics of the combined coastal region will now be discussed.

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(1) The Transaction Matrix

This matrix is a transaction table which summarizes data into an accounting framework that displays the detailed economic inter-workings of the region and is presented in Table 4.

Transactions are grouped into 26 sectors of business activity and one final demand sector. The horizontal rows show the distribution of the output of each sector to the other sectors. The columns show the input needs of each sector from the other sectors. Each entry in the table is therefore an output of one sector and simultaneously an input of another sector.

For instance, in the Transactions Matrix, Table 4, the input-output activities of Apparel & Textiles (sector 9), may be examined as follows: The entries in Column (9) show the input of each of the 26 producing sectors that are required for the production of Apparel & Textiles output. The sum total of the column is the total contribution of the region to the annual dollar production of Apparel & Textiles. The total shows that the activity of this sector for the year 1972 amounts to $56,242,000. The input contributions made by the 26 producing (endogenous) sectors was in the amount of $26,299,000. The difference between $56,242,000 and $26,299,000, which is $29,943,000, is the contribution of the primary input sector, "the value added" to the production of apparel and textiles. In essence, the "value added" describes the contribution by the exogenous non-producing sectors to the production of commodities and services which is composed of labor, government services as reflected by tax payments, depreciation, and imports.

The output of Apparel & Textiles sector is distributed among the other sectors as shown in row (9). An amount of $22,145,000 went to the 26 endogenous sectors, Column (27), and the difference between

TABLE 4
TRANSACTIONS MATRIX
MISSISSIPPI AND ALABAMA COASTAL COUNTIES--VALUES IN $THOUSANDS

#	SECTOR	1	2	3	4	5	6	7	8	9	10
1	FISHERIES	150.	0.	0.	0.	0.	0.	0.	21010.	0.	0.
2	FORESTRY	0.	391.	0.	0.	0.	0.	0.	0.	108.	0.
3	LIVESTOCK	0.	97.	1447.	468.	75.	0.	0.	13884.	0.	8223.
4	CROPS	0.	847.	4984.	869.	870.	0.	279.	13172.	0.	0.
5	AG,FOR,FISH SERVICES	195.	330.	338.	1410.	0.	0.	741.	0.	6.	477.
6	MINING	0.	0.	2.	54.	1.	882.	1250.	50.	117.	0.
7	CONSTRUCTION	0.	0.	131.	339.	0.	1095.	148.	719.	1.	10.
8	FOOD PROCESSING	390.	0.	2454.	0.	0.	0.	0.	31386.	12032.	398.
9	APPAREL & TEXTILES	390.	0.	0.	0.	60.	0.	190.	231.	29.	2.
10	LUMBER & WOOD	0.	0.	3.	38.	6.	19.	21438.	173.	835.	83.
11	PAPER & ALLIED	5.	1.	12.	71.	12.	62.	1214.	5388.	15.	16115.
12	PRINTING&PUBLISHING	2.	0.	3.	5.	188.	47.	4.	529.	2421.	490.
13	CHEMICALS & ALLIED	1848.	214.	219.	7.	3.	916.	15429.	2143.	3.	7.
14	STONE,CLAY & GLASS	1.	3.	4.	3650.	35.	278.	18923.	1762.	55.	1736.
15	PRIMARY&FABRC METALS	72.	51.	13.	19.	0.	247.	15164.	1555.	6.	389.
16	TRANSPORTATION EQUIP	4949.	0.	4.	17.	6.	13.	17.	7.	4335.	393.
17	OTHER MANUFACTURING	636.	54.	11.	15.	2.	322.	5037.	390.	14.	53.
18	WATER TRANSPORTATION	161.	441.	39.	124.	14.	337.	271.	1168.	601.	214.
19	OTHER TRANSPORTATION	212.	470.	575.	90.	1.	380.	8399.	2815.	703.	895.
20	COMMUNICATIONS&UTIL	322.	5.	123.	531.	49.	810.	1734.	2018.	2536.	1505.
21	WHLSL & RETAIL TRADE	1086.	143.	920.	349.	4.	693.	38469.	7997.	1276.	774.
22	FINANCE,INS,REAL EST	2049.	126.	491.	1765.	46.	5253.	5179.	2185.	47.	2745.
23	HOTEL,PERS&REPR SERV	0.	0.	5.	2610.	115.	0.	0.	423.	40.	897.
24	MEDICAL,EDUC&NONPROF	0.	0.	109.	0.	0.	18.	331.	81.	1112.	1.
25	OTHER SERVICES	40.	17.	122.	17.	0.	850.	18959.	6173.	7.	1069.
26	STATE & LOCAL GOV'T	3.	1.	2.	1381.	0.	0.	215.	78.		15.
	ENDOGENOUS TOTALS	12511.	3191.	12011.	13829.	1485.	12193.	153391.	115337.	26299.	38511.
27	FINAL PURCHASES	17117.	9546.	8061.	17502.	3212.	33781.	270395.	52801.	29943.	35946.
	TOTALS	29628.	12737.	20072.	31331.	4697.	45974.	423786.	168138.	56242.	74659.

TAbLE 4 — Continued
TRANSACTIONS MATRIX
MISSISSIPPI AND ALABAMA COASTAL COUNTIES--VALUES IN $THOUSANDS

	11	12	13	14	15	16	17	18	19	20	21	22	23
1	0.	0.	0.	0.	0.	0.	0.	0.	157.	0.	832.	0.	0.
2	2500.	0.	985.	3.	0.	0.	7.	25.	0.	0.	0.	39.	0.
3	0.	0.	26.	0.	0.	0.	61.	1.	6.	0.	0.	898.	0.
4	0.	0.	471.	0.	0.	0.	2350.	3.	240.	0.	29.	2728.	22.
5	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	387.	490.	0.
6	1187.	1.	31943.	1105.	1116.	98.	46.	1.	37.	6037.	12.	246.	10.
7	3644.	118.	5866.	529.	505.	2250.	822.	1665.	5810.	8945.	2451.	23932.	912.
8	2529.	0.	4574.	18.	8.	0.	373.	84.	744.	5.	3317.	578.	8.
9	535.	23.	226.	39.	52.	5417.	495.	190.	219.	66.	737.	101.	580.
10	25180.	6.	418.	216.	261.	5352.	1557.	0.	9.	3.	569.	118.	34.
11	110231.	4265.	9433.	1611.	417.	1554.	2652.	179.	213.	228.	5601.	843.	515.
12	1575.	1412.	135.	7.	80.	33.	164.	27.	85.	98.	705.	752.	22.
13	24031.	602.	111803.	1663.	1299.	5017.	10583.	1350.	6157.	2462.	7733.	3497.	2748.
14	436.	0.	1895.	3383.	219.	4144.	1202.	70.	74.	1.	769.	127.	179.
15	1624.	93.	3153.	287.	6559.	28288.	5462.	63.	115.	38.	557.	170.	209.
16	0.	2.	151.	48.	556.	147887.	2857.	1545.	1455.	18.	1117.	679.	54.
17	2799.	98.	2013.	366.	715.	15571.	8956.	478.	299.	406.	1649.	768.	1058.
18	3193.	60.	4932.	891.	3490.	2606.	682.	14278.	4144.	235.	316.	118.	23.
19	15737.	343.	14186.	2563.	2164.	1848.	3744.	9499.	4912.	1896.	4337.	2976.	577.
20	9375.	453.	11124.	1776.	1570.	5691.	2630.	1216.	3059.	33006.	15799.	5592.	2021.
21	15440.	731.	12203.	1461.	2612.	19390.	7865.	1958.	6175.	2198.	13735.	6631.	2579.
22	7665.	1205.	15450.	1163.	949.	6787.	3910.	4104.	5753.	4325.	37978.	47131.	6213.
23	1080.	52.	1005.	44.	85.	911.	243.	165.	171.	1500.	2050.	1223.	2666.
24	197.	44.	343.	34.	37.	287.	154.	76.	131.	146.	724.	1503.	216.
25	8781.	992.	24419.	1175.	1428.	16453.	5114.	2013.	3797.	7619.	32733.	16686.	2927.
26	164.	3.	165.	31.	19.	135.	30.	4728.	3649.	21069.	2526.	2868.	82.
27	237903.	10503.	256919.	18410.	24161.	269719.	61967.	43718.	47381.	90351.	136663.	120694.	23652.
	199509.	14900.	235409.	30282.	42143.	339803.	108155.	99791.	91767.	186217.	522081.	347928.	52425.
	437412.	25403.	492328.	48692.	66284.	609522.	170122.	143509.	139148.	276568.	658744.	468622.	76077.

TABLE 4 -- Continued
TRANSACTIONS MATRIX
MISSISSIPPI AND ALABAMA COASTAL COUNTIES--VALUES IN $THOUSANDS

	24	25	26	INTERMEDIATE DEMAND	FINAL DEMAND	TOTAL OUTPUT
1	0.	0.	66.	22215.	7413.	29628.
2	0.	0.	18.	12296.	441.	12737.
3	21.	44.	0.	17028.	3044.	20072.
4	114.	483.	83.	28021.	3310.	31331.
5	0.	73.	55.	4019.	678.	4697.
6	17.	1.	1309.	45421.	553.	45974.
7	3403.	1595.	87856.	153250.	270536.	423786.
8	2116.	0.	0.	48647.	119491.	168138.
9	186.	43.	247.	22145.	34097.	56242.
10	0.	0.	0.	73626.	833.	74459.
11	475.	338.	408.	147148.	290264.	437412.
12	1085.	12422.	471.	19641.	5762.	25403.
13	5179.	2118.	9069.	223922.	268406.	492328.
14	47.	704.	165.	34797.	13895.	48692.
15	14.	1310.	187.	65752.	532.	66284.
16	5.	3587.	233.	165260.	444262.	609522.
17	616.	1916.	619.	49464.	120658.	170122.
18	19.	245.	608.	39254.	104255.	143509.
19	875.	1744.	7360.	90268.	48880.	139148.
20	7965.	13904.	44094.	166117.	110451.	276568.
21	3901.	9454.	4524.	167257.	491487.	658744.
22	10464.	11093.	12568.	196947.	271675.	468622.
23	1185.	1181.	249.	14286.	61791.	76077.
24	2068.	387.	404.	7337.	195564.	202901.
25	5067.	14471.	12432.	185831.	55893.	241724.
26	357.	590.	495.	37232.	371428.	408660.
	45179.	77703.	183520.			
27	157722.	164021.	225140.			
	2J2901.	241724.	408660.			

the total output Column (29) of $56,242,000 and this amount, which

is $34,097,000 Column (28), constitutes sales to final demand, the

non-producing users. As was indicated in Section II, final demand

is composed of households, government, sales on capital account, and

exports.

(2) The Technical Coefficients Matrix

A brief look into the transactions matrix will make it obvious

that there is a fundamental relationship between the volume of the

output of a sector and the volume of inputs entering to generate its

activities. Thus, every entry in the table is dependent upon every

other entry. These relationships show the nature of technology

within the region, and they are the percentages of gross regional

output. A table displaying these coefficients is called the technical

coefficient matrix or the direct requirements matrix. Table 5 shows

the technical coefficients as obtained from the transactions table

shown in Table 4.

As an example, the Apparel & Textiles sector (9) shows that

approximately 47¢ of every dollar spent consists of purchases from the

other endogenous sectors and that approximately 53¢ went to final

purchases as payments to labor, government, depreciation, and imports.

If it can be assumed that such expenditures are determined by

inflexible technical considerations, these coefficients can be used

to estimate the demand by apparel and textiles for materials and

service inputs produced by the other sectors.

Given such a table, and assuming that the technical requirements

in each sector remain invariant, it is possible to compute transactions

tables for succeeding years by knowing the total output of the particular

industry for the particular year.

TABLE 5
DIRECT REQUIREMENTS MATRIX
MISSISSIPPI AND ALABAMA COASTAL COUNTIES

	SECTOR	1	2	3	4	5	6	7	8	9	10
1	FISHERIES	0.00506	0.0	0.0	0.0	0.0	0.0	0.0	0.12496	0.0	0.0
2	FORESTRY	0.0	0.03070	0.0	0.0	0.0	0.0	0.0	0.0	0.00192	0.11044
3	LIVESTOCK	0.0	0.00762	0.07209	0.01494	0.01597	0.0	0.0	0.08258	0.0	0.0
4	CROPS	0.0	0.36650	0.24831	0.02774	0.18522	0.0	0.00066	0.07834	0.0	0.0
5	AG,FOR,FISH SERVICES	0.00658	0.02591	0.01684	0.04500	0.0	0.0	0.00175	0.0	0.00011	0.00641
6	MINING	0.0	0.0	0.00010	0.00172	0.00021	0.01918	0.00295	0.00030	0.00208	0.0
7	CONSTRUCTION	0.0	0.0	0.00653	0.01082	0.0	0.02382	0.00035	0.00428	0.00002	0.00013
8	FOOD PROCESSING	0.01316	0.0	0.12226	0.0	0.01277	0.0	0.0	0.18667	0.21393	0.00535
9	APPAREL & TEXTILES	0.01316	0.0	0.0	0.00121	0.00128	0.00041	0.00045	0.00137	0.00052	0.00003
10	LUMBER & WOOD	0.0	0.0	0.0	0.00227	0.00255	0.00135	0.05059	0.00103	0.01485	0.00111
11	PAPER & ALLIED	0.00017	0.00008	0.00015	0.00016	0.04003	0.00102	0.00286	0.03205	0.00027	0.24329
12	PRINTING&PUBLISHING	0.00007	0.0	0.00060	0.00022	0.0	0.00002	0.00001	0.00315	0.04305	0.00658
13	CHEMICALS & ALLIED	0.06237	0.01680	0.01091	0.11650	0.00745	0.01992	0.03641	0.01275	0.00005	0.00009
14	STONE,CLAY & GLASS	0.00003	0.00024	0.00020	0.00061	0.0	0.00605	0.04465	0.01048	0.00098	0.02331
15	PRIMARY&FABRC METALS	0.00243	0.00400	0.00065	0.00054	0.00128	0.00537	0.03578	0.00925	0.00011	0.00522
16	TRANSPORTATION EQUIP	0.16704	0.0	0.00020	0.00048	0.00043	0.00028	0.00004	0.00004	0.07708	0.00528
17	OTHER MANUFACTURING	0.02147	0.00424	0.00055	0.00396	0.00298	0.00700	0.01189	0.00232	0.00025	0.00071
18	WATER TRANSPORTATION	0.00543	0.03462	0.00194	0.00287	0.00021	0.00733	0.00064	0.00695	0.01069	0.00287
19	OTHER TRANSPORTATION	0.00716	0.03690	0.02865	0.01695	0.01043	0.00761	0.01982	0.01674	0.01250	0.01202
20	COMMUNICATIONS&UTIL	0.01087	0.00039	0.00613	0.01114	0.00085	0.01762	0.00409	0.01200	0.04509	0.02021
21	WHLSL & RETAIL TRADE	0.03665	0.01123	0.04583	0.05633	0.00979	0.01507	0.09077	0.04756	0.02269	0.01039
22	FINANCE,INS,REAL EST	0.06916	0.00989	0.32446	0.08330	0.02448	0.11426	0.01222	0.01300	0.00084	0.03687
23	HOTEL,PERS&REPR SERV	0.0	0.0	0.00025	0.0	0.0	0.0	0.0	0.00252	0.00071	0.01205
24	MEDICAL,EDUC&NONPROF	0.0	0.0	0.00543	0.00054	0.0	0.00039	0.00078	0.00048	0.01977	0.00001
25	OTHER SERVICES	0.00135	0.00133	0.00608	0.04408	0.00021	0.01849	0.04474	0.03671	0.00012	0.01436
26	STATE & LOCAL GOV'T	0.00010	0.00008	0.00010	0.0	0.0	0.0	0.00051	0.00046	0.01977	0.00020
	ENDOGENOUS TOTALS	0.42227	0.25053	0.59840	0.44138	0.31616	0.26522	0.36195	0.68597	0.46760	0.51721
27	FINAL PURCHASES	0.57773	0.74947	0.40160	0.55862	0.68384	0.73478	0.63805	0.31403	0.53240	0.48279
	TOTALS	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

TABLE 5 - Continued
DIRECT REQUIREMENTS MATRIX
MISSISSIPPI AND ALABAMA COASTAL COUNTIES

	11	12	13	14	15	16	17	18	19	20	21	22	23
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00113	0.0	0.00126	0.0	0.0
2	0.00572	0.0	0.00200	0.0	0.0	0.0	0.00034	0.00017	0.0	0.0	0.0	0.00008	0.0
3	0.0	0.0	0.00005	0.0	0.0	0.0	0.00036	0.00031	0.00034	0.0	0.0	0.00192	0.0
4	0.0	0.00004	0.00096	0.0	0.0	0.0	0.01381	0.00002	0.00172	0.0	0.00004	0.00582	0.00029
5	0.0	0.00465	0.0	0.0	0.01684	0.00016	0.0	0.0	0.0	0.0	0.00059	0.00105	0.0
6	0.00271	0.0	0.06488	0.02269	0.00762	0.00369	0.00027	0.00001	0.00027	0.02183	0.00002	0.00052	0.00013
7	0.00833	0.00091	0.01191	0.01086	0.00012	0.0	0.00483	0.01160	0.04175	0.03234	0.00372	0.05107	0.01199
8	0.00578	0.00024	0.00929	0.00037	0.00078	0.00889	0.00219	0.00059	0.05535	0.00002	0.00504	0.00123	0.00011
9	0.00122	0.16789	0.00046	0.00080	0.00394	0.00878	0.00291	0.00132	0.00157	0.00024	0.00112	0.00022	0.00762
10	0.05757	0.05558	0.00085	0.00444	0.00629	0.00255	0.00915	0.0	0.00006	0.00001	0.00086	0.00025	0.00045
11	0.25201	0.02370	0.01916	0.03309	0.00121	0.00005	0.01559	0.00125	0.00153	0.00082	0.00850	0.00180	0.00677
12	0.00360	0.0	0.00027	0.00014	0.01960	0.00823	0.00096	0.00019	0.00061	0.00035	0.00107	0.00160	0.00029
13	0.05494	0.00366	0.22709	0.03415	0.00330	0.00680	0.06221	0.00941	0.04425	0.00890	0.01174	0.00746	0.03612
14	0.00100	0.00008	0.00385	0.06948	0.09895	0.04644	0.00707	0.00049	0.00053	0.00030	0.00117	0.00027	0.00235
15	0.00371	0.00386	0.00640	0.00589	0.00839	0.24263	0.03211	0.00044	0.00083	0.00032	0.00085	0.00036	0.00275
16	0.0	0.00236	0.00031	0.00099	0.01079	0.02555	0.01679	0.01077	0.01046	0.00007	0.00170	0.00145	0.00071
17	0.00640	0.01350	0.00409	0.00752	0.05265	0.00428	0.05264	0.00333	0.00215	0.00147	0.00250	0.00164	0.01391
18	0.00730	0.01783	0.01002	0.01830	0.03265	0.00303	0.00401	0.09949	0.02978	0.00085	0.00048	0.00025	0.00026
19	0.03598	0.02878	0.02881	0.05264	0.02369	0.09934	0.02201	0.06619	0.03530	0.00686	0.00658	0.00635	0.00758
20	0.02143	0.04744	0.02259	0.03647	0.03941	0.03181	0.01546	0.00847	0.02198	0.11934	0.02398	0.01193	0.02657
21	0.03530	0.02205	0.02479	0.03000	0.01432	0.01113	0.04623	0.01364	0.04438	0.00795	0.02085	0.01415	0.03390
22	0.01752	0.00173	0.03138	0.02388	0.00128	0.00149	0.02303	0.02860	0.04134	0.01504	0.05765	0.10057	0.08167
23	0.00247	0.03905	0.00204	0.00090	0.00056	0.00047	0.00143	0.00115	0.00123	0.00542	0.00311	0.00261	0.03504
24	0.00045	0.00012	0.00070	0.00070	0.02154	0.02699	0.00091	0.00053	0.00073	0.00053	0.00113	0.00321	0.00284
25	0.02007		0.04960	0.02413	0.00029	0.00022	0.03006	0.01403	0.02729	0.02755	0.04969	0.03561	0.03847
26	0.00037		0.00034	0.00064			0.03018	0.03295	0.02622	0.07618	0.00383	0.00612	0.00108
27	0.54389	0.41346	0.52185	0.37809	0.36421	0.44251	0.36425	0.30464	0.34051	0.32699	0.20746	0.25755	0.31090
	0.45611	0.58654	0.47815	0.62191	0.63579	0.55749	0.63575	0.69536	0.65949	0.67331	0.79254	0.74245	0.68910
	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

TABLE 5 - Continued
DIRECT REQUIREMENTS MATRIX
MISSISSIPPI AND ALABAMA COASTAL COUNTIES

	24	25	26
1	0.0	0.0	0.00016
2	0.0	0.0	0.00004
3	0.00010	0.00018	0.0
4	0.00056	0.00200	0.00020
5	0.0	0.00030	0.00013
6	0.00008	0.00000	0.00320
7	0.01677	0.00660	0.21499
8	0.01043	0.0	0.0
9	0.00092	0.00018	0.00060
10	0.0	0.0	0.0
11	0.00234	0.00140	0.00100
12	0.00535	0.05139	0.00115
13	0.02552	0.00876	0.02219
14	0.00023	0.00291	0.00040
15	0.00007	0.00542	0.00046
16	0.00002	0.01484	0.00057
17	0.00304	0.00793	0.00151
18	0.00009	0.00101	0.00149
19	0.00431	0.00721	0.01801
20	0.03926	0.05752	0.10790
21	0.01923	0.03911	0.01107
22	0.05157	0.04589	0.03075
23	0.00584	0.00489	0.00061
24	0.01019	0.00160	0.00099
25	0.02497	0.05987	0.03042
26	0.00176	0.00244	0.00121
	0.22267	0.32145	0.44908
27	0.77733	0.67855	0.55092
	1.00000	1.00000	1.00000

(3) Interdependence Coefficient Matrix

The interdependence coefficient matrix is given in Table 6.
Each column indicates the direct and indirect requirements from all
industries for a one dollar increase in final demand of the output of
the sector at the top of the column. The figures in the table show
the necessary changes in total endogenous output to meet the added
new requirements from the increase in final demand. The reason for
this can be explained as follows: In excess of the direct requirements
for the sector's output, the increase in final demand will necessitate
additional transactions within the other endogenous sectors. When a
sector increases its sales to final demand, the demand for other sectors'
production requirements will also increase. These other sectors in
their turn will require the support of output of each other. A chain
reaction is thus generated throughout the economy.

For instance, a one dollar increase in final demand for the
products of apparel and textiles, Column (9), will alter its requirements
of purchases from the other sectors in Column (9) of Table 6.

A comparison of Column (9) of Table 5 with Column (9) of Table 6
shows the nature of alterations in the input requirements of this sector
to meet the new increase of $1.00 in final demand. These new additions
to the requirements of the Apparel & Textiles sector from the other
sectors will result, in turn, in increased purchase requirements by all
other sectors. In essence, entries in Table 6 show the direct require-
ments of Table 5 plus the indirect requirements resulting from the effect
of increased final demand. In order to find the indirect requirements,
it is necessary to subtract each entry in Table 5 from a corresponding
entry in Table 6. For example, the indirect effect of a one dollar
increase in final demand for the output of the Apparel & Textiles sector

TABLE 6
DIRECT & INDIRECT REQUIREMENTS TABLE
MISSISSIPPI AND ALABAMA COASTAL COUNTIES

	SECTOR	1	2	3	4	5	6	7	8	9	10
1	FISHERIES	1.00751	0.00048	0.02127	0.00094	0.00267	0.00017	0.00041	0.15736	0.00041	0.00037
2	FORESTRY	0.00082	1.03194	0.00076	0.00113	0.00150	0.00066	0.00809	0.00156	0.00354	0.15108
3	LIVESTOCK	0.00207	0.01063	1.09823	0.01848	0.02258	0.00042	0.00042	0.11385	0.00044	0.00192
4	CROPS	0.00466	0.07979	0.30109	1.04414	0.20048	0.00143	0.00306	0.13271	0.00267	0.02117
5	AG,FOR,FISH SERVICES	0.00706	0.03057	0.03239	0.04757	1.00956	0.00032	0.00224	0.00915	0.00035	0.00501
6	MINING	0.00734	0.00320	0.00662	0.01390	0.00441	1.02299	0.00951	0.00710	0.00699	0.00492
7	CONSTRUCTION	0.01036	0.00674	0.02124	0.02407	0.00856	0.03490	1.00833	0.01836	0.01082	0.01454
8	FOOD PROCESSING	0.01857	0.00313	0.16800	0.00641	0.02071	0.00100	0.00191	1.25158	0.00232	0.00191
9	APPAREL & TEXTILES	0.01987	0.00050	0.00168	0.00219	0.00235	0.00082	0.00122	0.00607	1.27296	0.00233
10	LUMBER & WOOD	0.00466	0.00133	0.00442	0.00621	0.00924	0.00485	0.06927	0.00904	0.00563	1.32414
11	PAPER & ALLIED	0.00747	0.00398	0.01462	0.01034	0.05759	0.00444	0.01160	0.06119	0.03199	0.01569
12	PRINTING&PUBLISHING	0.00187	0.00091	0.00364	0.00458	0.00163	0.00216	0.00391	0.00892	0.00326	0.00225
13	CHEMICALS & ALLIED	0.09410	0.04069	0.07526	0.16729	0.04930	0.03374	0.06120	0.07016	0.08759	0.05470
14	STONE,CLAY & GLASS	0.00336	0.00109	0.00416	0.00322	0.00134	0.03882	0.04980	0.01640	0.02222	0.00883
15	PRIMARY&FABRC METALS	0.01714	0.00583	0.00536	0.00417	0.00335	0.00860	0.04266	0.01819	0.00709	0.01035
16	TRANSPORTATION EQUIP	0.22434	0.00202	0.00742	0.00349	0.00240	0.00206	0.00325	0.03801	0.00425	0.00345
17	OTHER MANUFACTURING	0.03214	0.00604	0.00507	0.00732	0.00567	0.03922	0.01547	0.01150	0.10565	0.00661
18	WATER TRANSPORTATION	0.01045	0.04253	0.00807	0.00715	0.00337	0.01018	0.00765	0.01595	0.00375	0.02665
19	OTHER TRANSPORTATION	0.01613	0.04704	0.04768	0.02890	0.02104	0.01349	0.03173	0.03903	0.02311	0.04066
20	COMMUNICATIONS&UTIL	0.32497	0.00718	0.02580	0.02881	0.01104	0.02824	0.02032	0.03770	0.03048	0.02510
21	WHLSL & RETAIL TRADE	0.05707	0.02375	0.08936	0.07636	0.03180	0.02595	0.10778	0.09600	0.07322	0.06207
22	FINANCE,INS,REAL EST	0.09429	0.02834	0.07908	0.11854	0.05576	0.13777	0.03397	0.06660	0.04948	0.03456
23	HOTEL,PERS&REPR SERV	0.00145	0.03051	0.00194	0.00158	0.00079	0.00095	0.00125	0.00491	0.00237	0.00092
24	MEDICAL,EDUC&NONPROF	0.00072	0.00036	0.00686	0.00148	0.00061	0.00105	0.00133	0.00200	0.00148	0.00077
25	OTHER SERVICES	0.02483	0.01319	0.04449	0.07121	0.02043	0.03288	0.06480	0.07554	0.04452	0.03356
26	STATE & LOCAL GOV'T	0.00375	0.00359	0.00468	0.00447	0.00208	0.00391	0.02402	0.06609	0.00398	0.00472
	TOTALS	1.69697	1.39539	2.07919	1.70397	1.55025	1.39105	1.56522	2.27495	1.78036	1.85826

TABLE 6 — Continued

DIRECT & INDIRECT REQUIREMENTS TABLE
MISSISSIPPI AND ALABAMA COASTAL COUNTIES

	11	12	13	14	15	16	17	18	19	20	21	22	23
1	0.00167	0.00049	0.00217	0.00045	0.00032	0.00021	0.00077	0.00038	0.00233	0.00014	0.00221	0.00039	0.00028
2	0.02006	0.00386	0.00371	0.00184	0.00115	0.00217	0.00234	0.00059	0.00077	0.00060	0.00052	0.00076	0.00065
3	0.00144	0.00052	0.00181	0.00038	0.00026	0.00022	0.00128	0.00032	0.00102	0.00016	0.00085	0.00274	0.00043
4	0.00436	0.00166	0.00430	0.00129	0.00101	0.00134	0.01680	0.00098	0.00364	0.00067	0.00174	0.00830	0.00179
5	0.00089	0.00034	0.00051	0.00025	0.00019	0.00022	0.00097	0.00020	0.00044	0.00023	0.00084	0.00176	0.00030
6	0.01247	0.00567	0.08838	0.03076	0.02286	0.00405	0.00865	0.00251	0.00631	0.02784	0.03252	0.00277	0.00530
7	0.02253	0.01615	0.02814	0.02359	0.01781	0.01067	0.01411	0.02915	0.05755	0.06035	0.01200	0.06167	0.02295
8	0.01203	0.00315	0.01632	0.00252	0.00157	0.00101	0.00513	0.00196	0.00845	0.00065	0.00712	0.00271	0.00161
9	0.00282	0.00200	0.00137	0.00170	0.00179	0.01545	0.00470	0.00244	0.00271	0.00369	0.00176	0.00060	0.01043
10	0.10436	0.02017	0.02017	0.01227	0.00855	0.01781	0.01675	0.00268	0.00499	0.00457	0.00329	0.00515	0.00369
11	1.34494	0.24197	0.03759	0.05165	0.01320	0.00924	0.02812	0.00427	0.00696	0.00383	0.01445	0.00558	0.01378
12	0.00811	1.06346	0.00542	0.00302	0.00382	0.00311	0.00430	0.00203	0.00359	0.00313	0.00481	0.00480	0.00381
13	0.11013	0.05763	1.30946	0.06215	0.03888	0.02567	0.09830	0.02402	0.06957	0.02300	0.02174	0.01904	0.05767
14	0.00424	0.00188	0.00814	1.07683	0.00570	0.01124	0.01000	0.00253	0.00429	0.00351	0.00240	0.00374	0.00452
15	0.00925	0.00751	0.01261	0.00999	1.11285	0.07086	0.04122	0.00343	0.00546	0.00383	0.00264	0.00388	0.00594
16	0.00319	0.00253	0.00422	0.00429	0.01535	1.32360	0.02606	0.01795	0.01691	0.00159	0.00448	0.00364	0.00320
17	0.01194	0.00791	0.00879	0.00109	0.01498	0.03905	1.05914	0.00592	0.00533	0.03533	0.00432	0.00382	0.01790
18	0.01743	0.00756	0.01873	0.02658	0.06793	0.01211	0.01054	1.11408	0.03642	0.00387	0.00183	0.00163	0.00239
19	0.06111	0.02947	0.04691	0.06772	0.04693	0.01219	0.03371	0.08023	1.04583	0.00274	0.01371	0.01145	0.01416
20	0.04664	0.03798	0.04798	0.05687	0.04039	0.02476	0.03190	0.02262	0.03950	1.15302	0.03615	0.02265	0.04205
21	0.06650	0.05058	0.04892	0.04758	0.05597	0.05522	0.06491	0.02674	0.06129	0.02121	1.02959	0.02743	0.04734
22	0.04708	0.07413	0.07174	0.04788	0.03485	0.02943	0.04571	0.04681	0.06337	0.03401	0.07371	1.12159	0.10674
23	0.00473	0.00399	0.00411	0.00228	0.00251	0.00300	0.00282	0.00226	0.00248	0.00734	0.00420	0.03365	1.03755
24	0.00120	0.00251	0.00156	0.00128	0.00107	0.00105	0.00151	0.00101	0.00134	0.00104	0.00159	0.00389	0.00362
25	0.04849	0.06232	0.08386	0.04372	0.03884	0.04969	0.05151	0.02819	0.04725	0.04516	0.06219	0.05083	0.05700
26	0.00700	0.00499	0.00684	0.00833	0.00742	0.00348	0.03460	0.04108	0.03249	0.08885	0.00769	0.00924	0.00581
	1.97460	1.71042	1.87033	1.59631	1.55587	1.72685	1.58586	1.46415	1.53029	1.50541	1.31534	1.38370	1.47090

TABLE 6 - Continued

DIRECT & INDIRECT REQUIREMENTS TABLE
MISSISSIPPI AND ALABAMA COASTAL COUNTIES

	24	25	26
1	0.00182	0.00022	0.00041
2	0.00043	0.00051	0.00203
3	0.00158	0.00052	0.00029
4	0.00286	0.00324	0.00155
5	0.00032	0.00063	0.00076
6	0.00418	0.00368	0.01072
7	0.02529	0.01721	0.22807
8	0.01411	0.00106	0.00125
9	0.00152	0.00091	0.00129
10	0.00253	0.00311	0.01614
11	0.00773	0.01759	0.00650
12	0.00809	0.05905	0.00464
13	0.04024	0.02229	0.04823
14	0.00210	0.00477	0.01215
15	0.00224	0.00941	0.01109
16	0.00170	0.02207	0.00299
17	0.00489	0.01111	0.00633
18	0.00151	0.00327	0.00498
19	0.00902	0.01352	0.02951
20	0.05270	0.07802	0.13461
21	0.02909	0.05254	0.04209
22	0.06786	0.06776	0.05212
23	0.00708	0.00658	0.00219
24	1.01077	0.00228	0.00168
25	0.03828	1.07888	0.05719
26	0.00676	0.00972	1.01320
	1.34470	1.48995	1.69200

can be computed as shown in Table 7. Similar tables can be constructed

for all 26 sectors.

TABLE 7

INDIRECT EFFECT COEFFICIENTS-
RESPONSE TO ONE DOLLAR INCREASE IN FINAL
DEMAND IN THE APPAREL AND TEXTILES SECTOR-
MISSISSIPPI-ALABAMA COASTAL REGION, 1972

Sector	Total Effect*	Direct Effect**	Indirect Effect
1	.00041	.0	.00041
2	.00354	.00192	.00162
3	.00044	.0	.00044
4	.00267	.0	.00267
5	.00035	.0	.00035
6	.00699	.00011	.00688
7	.01082	.00208	.00874
8	.00232	.00002	.00230
9	1.27296	.21393	1.05903
10	.00563	.00052	.00511
11	.03199	.01485	.01714
12	.00326	.00027	.00299
13	.08759	.04305	.04454
14	.00222	.00005	.00217
15	.00709	.00098	.00611
16	.00425	.00011	.00414
17	.10545	.07708	.02837
18	.00375	.00025	.00350
19	.02311	.01069	.01242
20	.03048	.01250	.01798
21	.07322	.04509	.02813
22	.04948	.02269	.02679
23	.00237	.00084	.00153
24	.00148	.00071	.00077
25	.04452	.01977	.02475
26	.00398	.00012	.00386

*Column (9), Table 6
**Column (9), Table 5

V. MULTIPLIER ANALYSIS

In regional analysis, input-output analysis is of importance in
evaluating the impact of a change in a single sector on all other
sectors. The model can determine output, income, and employment multi-
pliers for every sector in the transaction matrix. In general,
multipliers measure the spread of impulses that originate in any par-
ticular sector to all the others due to exogenous changes outside the
producing sectors such as changes in final demand, income, or employment.
The impulses lead to a series of effects from one sector to another
which include, of course, the original sector. The multipliers can
show how a growth or decline in the activity of one sector can induce
growth or decline in the other sectors. This knowledge can be utilized
to forecast future economic development as well as to aid in economic
planning.

In practice, two types of multipliers are computed and are given
the names Type I and Type II. The former is calculated by considering
the Household sector as being exogenous to the processing sector,
while the latter is obtained by making the Household sector endogenous
with the processing sectors.

For the purpose of computing income multipliers and Type II
multipliers, it was necessary to estimate the values of the Household
sector both as purchasers in the forms of column entries and income
recipients as row entries. The estimated values are given in Table 8.

TABLE 8

ESTIMATED HOUSEHOLD SECTOR--
MISSISSIPPI AND ALABAMA COASTAL
REGION, 1972
(VALUES IN $ THOUSANDS)

Sector	Households As Consumers (1)	Households Income Recipients	
		$ Total (2)	Proportion of Sector's Total Cost of Production (3)
1	2,904	10,999	.37
2	0	4,216	.33
3	2,368	4,262	.21
4	2,949	10,840	.35
5	491	1,690	.36
6	49	12,534	.27
7	157,061	144,336	.34
8	26,935	42,298	.25
9	23,785	21,329	.38
10	722	13,947	.19
11	2,902	75,978	.17
12	5,073	6,476	.25
13	20,406	116,663	.24
14	1,834	16,958	.35
15	492	20,693	.31
16	4,111	175,137	.29
17	39,257	67,700	.40
18	1,753	37,582	.26
19	11,300	55,485	.40
20	91,166	64,828	.23
21	376,307	304,736	.46
22	214,044	78,527	.17
23	25,285	38,318	.50
24	113,382	120,224	.59
25	53,475	118,319	.49
26	65,513	168,350	.41

These values are obtained as a general rule by summing the corresponding values of the separate models of Mississippi [11] and Alabama [4].

(1) Type I Multipliers

    a. Output Multipliers

        Output multipliers are measures of the indirect effects of changes in the final demand for output of each sector and the impulse it generates throughout the economy. In Table 9, Column (1), output multipliers for the 26 sectors of the Mississippi-Alabama coastal region are given. The table shows that an increase of one dollar in final demand for the Fisheries sector, for instance, will cause a change in total output in the region of approximately $1.70. Similarly, a multiplier value of 1.40 for Forestry means that a one dollar increase in final demand for the products of this sector will generate about $1.40. of output in the whole economy. The highest multiplier is registered by the Food Processing sector and the lowest by Wholesale & Retail Trade.

        If final demand changes were assumed to have taken place simultaneously in all industries, then a total increase of $26 in final demand will generate an additional $42.52 in total output. On an average basis, the multiplier has a value of 1.64.

    b. Income Multipliers

        Income multipliers for the 26 sectors of the Mississippi-Alabama coastal region are given in Column (2) of Table 9. They measure the total change throughout the regional economy from a change in income within a sector. For instance, a one dollar increase in income of the Fisheries sector will generate a $1.56 income increase throughout the economy. Income multipliers for the other sectors can be analyzed in a similar manner.

TABLE 9
TYPE I MULTIPLIERS
MISSISSIPPI AND ALABAMA COASTAL COUNTIES

| | SECTOR | MULTIPLIERS | | |
		OUTPUT	INCOME	EMPL.
1	FISHERIES	1.70	1.56	1.55
2	FORESTRY	1.40	1.39	2.34
3	LIVESTOCK	2.08	2.59	2.64
4	CROPS	1.70	1.62	1.30
5	AG,FOR,FISH SERVICES	1.55	1.46	1.40
6	MINING	1.39	1.40	2.40
7	CONSTRUCTION	1.57	1.56	1.72
8	FOOD PROCESSING	2.27	2.56	2.96
9	APPAREL & TEXTILES	1.78	1.72	1.62
10	LUMBER & WOOD	1.86	2.27	1.78
11	PAPER & ALLIED	1.97	2.44	2.31
12	PRINTING&PUBLISHING	1.71	1.74	1.46
13	CHEMICALS & ALLIED	1.87	2.07	3.16
14	STONE,CLAY & GLASS	1.60	1.53	1.75
15	PRIMARY&FABRC METALS	1.56	1.57	1.60
16	TRANSPORTATION EQUIP	1.73	1.80	1.75
17	OTHER MANUFACTURING	1.59	1.47	2.09
18	WATER TRANSPORTATION	1.46	1.57	1.59
19	OTHER TRANSPORTATION	1.53	1.43	1.63
20	COMMUNICATIONS&UTIL	1.51	1.69	1.86
21	WHLSL & RETAIL TRADE	1.32	1.21	1.18
22	FINANCE,INS,REAL EST	1.38	1.69	1.75
23	HOTEL,PERS&REPR SERV	1.47	1.30	1.22
24	MEDICAL,EDUC&NONPROF	1.34	1.18	1.21
25	OTHER SERVICES	1.49	1.32	1.28
26	STATE & LOCAL GOV'T	1.69	1.53	1.38
	TOTAL	42.52	43.67	46.93
	AVERAGE	1.64	1.68	1.81

If all sectors simultaneously experience an increase in income of one dollar each, then the total income in the region will increase to $43.67 due to the income multiplier effect. On an average basis, the income multiplier effect has a value of 1.68 as shown in Table 9.

c. Employment Multipliers

Employment multipliers are defined as the total employment generated in the economy by a one unit change in employment in a particular sector. The values of the multiplier are given in column (3) of Table 9. Each coefficient represents the magnitude of the increase in employment in a sector that is felt throughout the economy. For instance, a one unit change in employment in the food processing industry will generate directly and indirectly 1.93 units of employment in the economy. On a total basis, total employment attributable to employment multipliers of the 26 sectors is 46.93 units. On an average basis, the value is 1.81 units.

(2) Type II Multipliers

When Households are considered to function as part of the endogenous producing sectors, a new input-output multiplier will result. In this case, the Household sector is placed within the endogenous portion of the transaction matrix. For the Mississippi-Alabama coastal region, the augmented transactions table will have a matrix composed of 27 x 27 rows and columns which define the endogenous sectors. The inverse of this new matrix is given in Table 10 and is labeled Direct, Indirect, and Induced Requirements Table. In a sense, it is a new interdependence coefficients matrix.

TABLE 10
DIRECT, INDIRECT, & INDUCED REQUIREMENTS TABLE
MISSISSIPPI AND ALABAMA COASTAL COUNTIES

SECTOR	1	2	3	4	5	6	7	8	9	10
1 FISHERIES	1.01153	0.00367	0.02509	0.00484	0.00632	0.00283	0.00410	0.16183	0.00494	0.00332
2 FORESTRY	0.00195	1.03284	0.00184	0.00223	0.00254	0.00141	0.00914	0.00282	0.00482	0.15192
3 LIVESTOCK	0.00539	0.01326	1.10138	0.02170	0.02559	0.00261	0.00346	0.11754	0.00418	0.00436
4 CROPS	0.01027	0.08425	0.30642	1.04960	0.20558	0.00514	0.00821	0.13896	0.00900	0.02529
5 AG,FOR,FISH SERVICES	0.00811	0.03140	0.03339	0.04859	1.01051	0.00101	0.00320	0.01032	0.00153	0.00578
6 MINING	0.01199	0.00689	0.01104	0.01841	0.00863	1.02606	0.01378	0.01228	0.01223	0.00833
7 CONSTRUCTION	0.10574	0.08248	0.11193	0.11679	0.09527	0.09787	1.09584	0.12459	0.11832	0.08465
8 FOOD PROCESSING	0.03744	0.01812	0.18594	0.02476	0.03787	0.01346	0.01922	1.27260	0.02359	0.01578
9 APPAREL & TEXTILES	0.03506	0.01256	0.01612	0.01696	0.01616	0.01085	0.01515	0.02298	1.29007	0.01350
10 LUMBER & WOOD	0.01310	0.00803	0.01245	0.01442	0.01691	0.01042	0.07702	0.01845	0.01514	1.33035
11 PAPER & ALLIED	0.01736	0.01184	0.02403	0.01996	0.06659	0.01098	0.02068	0.07221	0.04314	0.02296
12 PRINTING&PUBLISHING	0.00857	0.00623	0.01301	0.01110	0.00773	0.00659	0.01006	0.01638	0.01082	0.00717
13 CHEMICALS & ALLIED	0.12758	0.06728	0.10710	0.19984	0.07974	0.05585	0.09192	0.10745	0.12533	0.07932
14 STONE,CLAY & GLASS	0.01011	0.00645	0.01059	0.00978	0.00748	0.01327	0.05599	0.02392	0.00983	0.01379
15 PRIMARY&FABRC METALS	0.02374	0.01108	0.01164	0.01059	0.00935	0.01296	0.04872	0.02555	0.01453	0.01521
16 TRANSPORTATION EQUIP	0.23061	0.00699	0.01337	0.00958	0.00810	0.00619	0.00900	0.04499	0.01131	0.00805
17 OTHER MANUFACTURING	0.05660	0.02549	0.02833	0.03109	0.02791	0.02537	0.03791	0.03874	0.13301	0.02458
18 WATER TRANSPORTATION	0.01382	0.04521	0.01128	0.01043	0.00644	0.01240	0.01075	0.01971	0.00756	0.02913
19 OTHER TRANSPORTATION	0.03175	0.05945	0.06254	0.04409	0.03524	0.02381	0.04607	0.05643	0.04072	0.05214
20 COMMUNICATIONS&UTIL	0.09610	0.06365	0.09343	0.09795	0.07571	0.07519	0.08558	0.11692	0.11065	0.07738
21 WHLSL & RETAIL TRADE	0.25931	0.18434	0.28165	0.27295	0.21566	0.15945	0.29332	0.32124	0.30116	0.21072
22 FINANCE,INS,REAL EST	0.23571	0.14064	0.21356	0.25601	0.18433	0.23113	0.16373	0.22410	0.20887	0.13851
23 HOTEL,PERS&REPR SERV	0.01606	0.01210	0.01583	0.01578	0.01406	0.01059	0.01464	0.02117	0.01883	0.01165
24 MEDICAL,EDUC&NONPROF	0.05541	0.04379	0.05887	0.05464	0.05033	0.03715	0.35151	0.06290	0.06312	0.04097
25 OTHER SERVICES	0.08302	0.05940	0.09982	0.12778	0.07333	0.07129	0.11819	0.14035	0.11010	0.07633
26 STATE & LOCAL GOV'T	0.04237	0.03425	0.04140	0.04201	0.03719	0.02941	0.03945	0.04910	0.04751	0.03310
27 HOUSEHOLDS	0.88065	0.69927	0.83734	0.85603	0.80060	0.58131	0.80796	0.98077	0.99253	0.64731
TOTALS	3.42935	2.77097	3.72638	3.38793	3.12516	2.53457	3.15461	4.20428	3.73283	3.13162

TABLE 10 — Continued
DIRECT, INDIRECT, & INDUCED REQUIREMENTS TABLE
MISSISSIPPI AND ALABAMA COASTAL COUNTIES

	11	12	13	14	15	16	17	18	19	20	21	22	23
1	0.00462	0.00357	0.00557	0.00417	0.00373	0.00382	0.00484	0.00324	0.00630	0.00289	0.00612	0.00236	0.00483
2	0.02090	0.00473	0.00467	0.00289	0.00212	0.00319	0.00349	0.00140	0.00189	0.00138	0.00162	0.00131	0.00194
3	0.03387	0.00306	0.03462	0.00344	0.00307	0.00319	0.00465	0.00268	0.00429	0.00243	0.00407	0.00437	0.00418
4	0.00848	0.00596	0.00906	0.00648	0.00577	0.00637	0.02249	0.00497	0.00918	0.00452	0.00720	0.01106	0.00815
5	0.00167	0.00115	0.00140	0.00122	0.00109	0.00116	0.00204	0.00094	0.00147	0.00095	0.00187	0.00227	0.00149
6	0.01588	0.00923	0.09232	0.03506	0.02680	0.00822	0.01337	0.00582	0.01090	0.03103	0.00704	0.00506	0.01057
7	0.09260	0.08930	0.10903	0.11176	0.09872	0.04626	0.11095	0.09710	0.15175	0.12579	0.10484	0.10853	0.13113
8	0.02589	0.01762	0.03233	0.01996	0.01757	0.01795	0.02429	0.01540	0.02709	0.01360	0.02549	0.01199	0.02302
9	0.01398	0.01364	0.01425	0.01573	0.01467	0.02908	0.02012	0.01326	0.01771	0.01111	0.01654	0.00806	0.02765
10	0.11056	0.02664	0.01392	0.02007	0.01571	0.02539	0.02533	0.00870	0.01673	0.01036	0.01150	0.00930	0.01326
11	1.35221	0.24957	0.04598	0.06079	0.02160	0.01812	0.03817	0.01132	0.01021	0.01062	0.02408	0.01044	0.02500
12	0.01303	1.06860	0.01110	0.00921	0.00950	0.00912	0.01111	0.00680	0.10464	0.00773	0.01133	0.00809	0.01141
13	0.13473	0.08331	1.33786	0.09310	0.06728	0.05572	0.13230	0.04787	0.01096	0.04598	0.05433	0.03549	0.09565
14	0.00921	0.00706	0.01387	1.08308	0.01143	0.01730	0.01686	0.00735	0.01199	0.00815	0.00898	0.00706	0.01218
15	0.01410	0.01258	0.01821	0.01610	1.11845	0.07679	0.04793	0.00813	0.02310	0.00836	0.00907	0.00713	0.01343
16	0.00779	0.00733	0.00953	0.01008	0.02066	1.32922	0.03242	0.02242	0.02949	0.00589	0.01058	0.00672	0.01031
17	0.02990	0.02666	0.02954	0.03370	0.03573	0.06100	1.08397	0.02334	0.03975	0.02365	0.02813	0.01583	0.04564
18	0.01991	0.01015	0.02159	0.02970	0.07080	0.01513	0.01397	1.11648	0.06127	0.00505	0.00511	0.00329	0.00622
19	0.07259	0.04146	0.06016	0.08216	0.06018	0.02621	0.04958	0.09136	1.10975	0.02443	0.02292	0.01913	0.03188
20	0.09689	0.09253	0.10830	0.12261	0.10042	0.08859	0.10412	0.07329	0.10975	1.20182	0.10538	0.05759	0.12272
21	0.21506	0.20568	0.22045	0.23452	0.22752	0.23670	0.27025	0.17083	0.26104	0.15997	1.22644	0.12678	0.27672
22	0.15096	0.18259	0.19168	0.17861	0.15481	0.15634	0.18930	0.14757	0.20306	0.13105	0.21136	1.19106	0.05411
23	0.01545	0.01519	0.01649	0.01577	0.01489	0.01613	0.01765	0.01246	0.01693	0.01706	0.01841	0.01082	1.05411
24	0.04137	0.04446	0.04795	0.05183	0.04746	0.05183	0.05703	0.03728	0.05535	0.03856	0.05482	0.03076	0.06565
25	0.09124	0.10695	0.13322	0.09751	0.08820	0.10191	0.11063	0.06965	0.10473	0.08509	0.11883	0.07942	0.12301
26	0.03537	0.03460	0.03959	0.04402	0.04018	0.03813	0.04381	0.06859	0.07063	0.11535	0.04528	0.02821	0.04961
27	0.64690	0.67537	0.74689	0.81401	0.74701	0.79026	0.89414	0.62742	0.86980	0.60424	0.85717	0.43263	0.99882
	3.24716	3.03899	3.33959	3.19618	3.02535	3.28142	3.34478	2.69838	3.24133	2.69405	3.00153	2.23476	3.43574

TABLE 10 -- Continued
DIRECT, INDIRECT, & INDUCED REQUIREMENTS TABLE
MISSISSIPPI AND ALABAMA COASTAL COUNTIES

	24	25	26	27
1	0.00668	0.00471	0.00480	0.00696
2	0.00180	0.00178	0.00327	0.00197
3	0.00558	0.00422	0.00391	0.00574
4	0.00965	0.00951	0.00769	0.00972
5	0.00159	0.00180	0.00191	0.00182
6	0.00981	0.00887	0.01580	0.00805
7	0.14069	0.12384	0.33235	0.16519
8	0.03694	0.02215	0.02188	0.03268
9	0.01990	0.01788	0.01789	0.02630
10	0.01274	0.01255	0.02537	0.01462
11	0.01970	0.02866	0.01733	0.01714
12	0.01620	0.06654	0.01196	0.01161
13	0.08076	0.05973	0.08483	0.05799
14	0.01028	0.01232	0.01953	0.01170
15	0.01023	0.01679	0.01831	0.01144
16	0.00928	0.02907	0.00984	0.01085
17	0.03449	0.03846	0.03307	0.04236
18	0.00560	0.00704	0.00867	0.00584
19	0.02792	0.03099	0.04659	0.02706
20	0.13876	0.15753	0.21237	0.12319
21	0.27377	0.27862	0.26319	0.35026
22	0.23896	0.22586	0.20673	0.24493
23	0.02474	0.02291	0.01815	0.02529
24	1.07694	0.05342	0.06147	0.09472
25	0.10869	1.16393	0.12081	0.10078
26	0.05348	0.05289	1.05542	0.06688
27	1.06547	0.98446	0.96276	1.52517
	3.44065	3.42655	3.58591	3.00026

The main reason for the inclusion of Households within the producing sectors is to calculate the multipliers, taking in consideration not only the direct and indirect impacts of an increase in output by each sector but also the added induced effects of consumption by households. The multipliers obtained thus are termed Type II multipliers in contrast to Type I multipliers.

Since spending by consumers is taken into consideration, Type II multipliers are thought to be more realistic as a tool in analyzing the total effect of output, income, and employment due to changes in these variables. These multipliers are given in Table 11 and have similar interpretation as those of Type I multipliers.

If final demand for all sectors were to change simultaneously, a total increase of $26 in final demand will result in an $83.43 increase in output. On an average basis, it is $3.21.

Similarly, if all sectors simultaneously experience a one dollar increase in income the total increase of $26.00 will generate $66.57 additional income throughout the economy because of the multiplier effect. On an average basis, it is about $2.56.

For Type II employment multipliers, the total effect due to these multipliers is 76.59 units with an average of 2.95 units if it is assumed that each sector experiences a one unit increase in employment.

TABLE 11
TYPE II MULTIPLIERS
MISSISSIPPI AND ALABAMA COASTAL COUNTIES

	SECTOR	MULTIPLIERS		
		OUTPUT	INCOME	EMPL.
1	FISHERIES	3.43	2.37	2.44
2	FORESTRY	2.77	2.11	4.58
3	LIVESTOCK	3.73	3.94	3.70
4	CROPS	3.39	2.47	1.71
5	AG,FOR,FISH SERVICES	3.13	2.23	1.87
6	MINING	2.53	2.13	5.38
7	CONSTRUCTION	3.15	2.37	2.81
8	FOOD PROCESSING	4.20	3.90	4.49
9	APPAREL & TEXTILES	3.73	2.62	2.49
10	LUMBER & WOOD	3.13	3.46	2.50
11	PAPER & ALLIED	3.25	3.72	3.53
12	PRINTING&PUBLISHING	3.04	2.65	2.01
13	CHEMICALS & ALLIED	3.34	3.15	6.14
14	STONE,CLAY & GLASS	3.20	2.34	3.14
15	PRIMARY&FABRC METALS	3.03	2.39	2.59
16	TRANSPORTATION EQUIP	3.28	2.75	2.66
17	OTHER MANUFACTURING	3.34	2.25	4.10
18	WATER TRANSPORTATION	2.70	2.40	2.54
19	OTHER TRANSPORTATION	3.24	2.18	2.81
20	COMMUNICATIONS&UTIL	2.69	2.58	3.04
21	WHLSL & RETAIL TRADE	3.00	1.85	1.70
22	FINANCE,INS,REAL EST	2.23	2.58	2.72
23	HOTEL,PERS&REPR SERV	3.44	1.98	1.74
24	MEDICAL,EDUC&NONPROF	3.44	1.80	1.99
25	OTHER SERVICES	3.43	2.01	1.86
26	STATE & LOCAL GOV'T	3.59	2.34	2.05
	TOTAL	83.43	66.57	76.59
	AVERAGE	3.21	2.56	2.95

VI. EVALUATION OF THE MODEL

This report is the product of a joint effort undertaken by two separate study groups in Mississippi and Alabama. Each unit constructed an input-output model for its coastal region, and this -- the combined input-output model for the whole Mississippi-Alabama coastal region -- is a bi-product of the two endeavors. Therefore, in order to use this study to advantage, occasional reference should be made to the separate models [11] and [4].

It should be pointed out that the Transactions Matrix given in Table 4 is not composed of simple aggregations of the corresponding entries of the separate models. Instead, it was generated independently, using the scheme outlined in Section III. That is, using 1972 total sector outputs of the whole region, and relying on the national input-output table of 1971 [13], a transactions table was created. Through this, one can make the assumption that the interworking of the U.S. economy is reflected in the Mississippi-Alabama economy as well. In other words, sales and purchases of the regional producing sectors are somewhat similar on an average basis to the U.S. experience as a whole, scaled by the location quotients discussed in Section III.

Even though the separate models used principally the same techniques followed here, an important difference exists between the approaches. In the separate models, some adjustments were made on the initial Transactions Matrix to make it more compatible with local

experiences. It was possible to do this because each group used its own intuition and knowledge of the area to make the proper alterations. Such a procedure was not followed in the combined model.

The theory as well as the methodology followed in constructing the combined model is sound and common among researchers in regional input-output studies. Yet, the users of the information contained in this report should be cautious when analyzing and applying the results.

APPENDIX

APPENDIX TABLE A

Composition of Sectors of the Mississippi-Alabama Model

Model Sector	Industries Included in Sector
1. Fisheries	a. Commercial Fishing
2. Forestry	a. Timber Tracts b. Forest Nurseries, Tree Seed Gathering, Extracting c. Gathering of Miscellaneous Forest Products
3. Livestock	a. Livestock b. Poultry, Eggs, and Animal Specialties (Except Poultry Hatcheries)
4. Crops	a. Agricultural Crop Production b. Vegetables and Melons c. Fruits and Tree Nuts d. Horticultural Specialties
5. Agricultural, Forestry, and Fisheries Services	a. Soil and Crop Preparation and Other Forestry Services b. Poultry and Fish Hatcheries, Veterinary, and Other Animal Services c. Farm Labor and Management Service d. Landscape and Horticultural Services
6. Mining	a. Mining and Quarrying of Non-Metallic Minerals and Gravel b. Oil and Gas Extraction
7. Construction	a. New, Repair, and Maintenance Construction b. General and Special Trade Contractors

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Model Sector	Industries Included in Sector
8. Food Processing	a. Meat and Seafood Products b. Dairy and Bakery Products c. Beverages d. Miscellaneous Food Preparations
9. Apparel and Textiles	a. Men's, Women's, and Youth's, Outerwear and Undergarments b. Hats, Caps, and Millinery c. Miscellaneous Fabricated Textile Products
10. Lumber and Wood	a. Logging Camps, and Contractors b. Sawmills and Planing Mills c. Millwork, Veneer, and Plywood d. Wood Containers e. Wood Buildings and Mobile Homes f. Miscellaneous Wood Products (Except Furniture)
11. Paper and Allied	a. Industrial and Coated Paper b. Paperboard Containers and Boxes
12. Printing and Publishing	a. Newspapers, Periodicals, and Commercial Printing b. Manifold Business Forms and Miscellaneous Publishing c. Service Industry for Printing Trade
13. Chemicals and Allied	a. Industrial Organic and Inorganic Chemicals b. Agricultural Chemicals c. Plastics, Synthetics, and Fibers d. Drugs e. Paints, Varnishes, Lacquers, Enamels, and Related f. Petroleum Refining g. Paving and Roofing Materials h. Miscellaneous Petroleum Products

TABLE A--CONTINUED

Model Sector	Industries Included in Sector
14. Stone, Clay and Glass	a. Glass and Glassware: Flat, Pressed, and Blown b. Cement, Concrete, Gypsum, and Plaster Products c. Structural Clay Products d. Pottery and Related Products e. Cut Stone and Stone Products f. Abrasive, Asbestos, and Miscellaneous Non-Metallic Mineral Products
15. Primary and Fabricated Metals	a. Iron and Steel Foundries b. Primary Smelting and Refining of Nonferrous Metals c. Secondary Smelting d. Rolling, Drawing, and Extruding of Nonferrous Metals e. Nonferrous Foundries (castings) f. Fabricated Structural Metal Products g. Metal Cans and Shipping Containers h. Metal Forging, Stampings, and Miscellaneous Fabricated Metals
16. Transportation Equipment	a. Shipbuilding and Repairing b. Miscellaneous Transportation Equipment
17. Other Manufacturing	a. Furniture and Fixtures b. Rubber and Miscellaneous Plastics Products c. Leather and Leather Products d. Electrical and Other Machinery and Equipment Supplies e. Measuring, Analyzing-Controlling Instruments, and Medical-Optical Goods f. Miscellaneous Manufacturing Industries
18. Water Transportation	a. Deep Sea Transport b. Transportation on Rivers and Canals c. Local Water Transportation d. Incidental Services

TABLE A --CONTINUED

Model Sector	Industries Included in Sector
19. Other Transportation	a. Railroads b. Local and Suburban Transit and Inter-urban Highway Passenger Transportation (Bus, Cab) c. Motor Freight and Warehousing d. Air Transportation e. Pipelines (Except Natural Gas) f. Transportation Services
20. Communications and Public Utilities	a. Telephone and Telegraph b. Radio and Television c. Other Communications Services d. Electric Power Services e. Natural Gas Production and Distribution f. Electric, Gas, and Other Utilities g. Water Supply h. Sanitary Services i. Steam Supply
21. Wholesale and Retail Trade	a. Restaurants and Fast Food Franchises b. Bars and Taverns c. Gasoline Service Stations d. Wholesale: Durable and Nondurable Goods e. Building Materials, Hardware and Garden Supply, and Mobile Home Dealers f. General Merchandise, Apparel, and Accessory Stores g. Food Stores h. Automotive Dealers i. Furniture, Equipment, and Miscellaneous Retail Stores
22. Finance, Insurance, and Real Estate	a. Banking, Savings Institutions, and Credit Agencies b. Security and Commodity Brokers and Exchanges c. Insurance, Insurance Agents, Brokers, and Service d. Real Estate e. Holding and Other Investment Offices

TABLE A -- Continued

Model Sector		Industries Included in Sector
23. Hotels, Personal and Repair Services	a.	Hotels, Motels, Tourist Courts and Camps
	b.	Personal, Business and Legal Services
	c.	Automotive Repair and Garages
	d.	Miscellaneous Repair Service
24. Medical, Educational, and Non-Profit Services	a.	Offices of Physicians, Dentists, Osteopathic Physicians, and Other Health Practitioners
	b.	Hospitals, Nursing, and Personal Care Facilities
	c.	Medical and Dental Laboratories
	d.	Outpatient Care Facilities and Other Health and Allied Services
	e.	Elementary and Secondary Schools, Colleges, Universities and Branches, Junior Colleges, Vocational and Special Schools
	f.	Libraries and Information Centers
25. Other Services	a.	Miscellaneous Services
	b.	Motion Pictures, Amusement, and Other Recreational Services
	c.	Museums, Art Galleries, Botanical and Zoological Gardens
	d.	Social Services
	e.	Membership Organizations
26. State and Local Government	a.	Municipal Government
	b.	County Government
	c.	State Government

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