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An interindustry analysis of Tennessee with emphasis on agriculture

Charles MacArthur Wilson

To the Graduate Council:

I am submitting herewith a dissertation written by Charles MacArthur Wilson entitled "An interindustry analysis of Tennessee with emphasis on agriculture." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Agricultural Economics.

Joe A. Martin, Major Professor

We have read this dissertation and recommend its acceptance:

Merton B. Badenhop, Larry M. Boone, Selwyn G. Geller, Hans E. Jensen, T. J. Whatley

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

May 20, 1968

To the Graduate Council:

I am submitting herewith a dissertation written by Charles MacArthur Wilson entitled "An Interindustry Analysis of Tennessee with Emphasis on Agriculture." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Agricultural Economics.

W. A. Martin
Major Professor

We have read this dissertation
and recommend its acceptance:

J. J. Butler

R. B. Badenhop

Selwyn G. Geller

Larry M. Boone

Hans S. Jensen

Accepted for the Council:

Helen A. Smith
Vice President for
Graduate Studies and Research

AN INTERINDUSTRY ANALYSIS OF TENNESSEE WITH EMPHASIS ON AGRICULTURE

A Dissertation

Presented to

the Graduate Council of

The University of Tennessee

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

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by

Charles MacArthur Wilson

June 1968

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ABSTRACT

This study was concerned with the interrelationships of agriculture and agricultural related industries and nonagricultural industries in the Tennessee economy. The principal objective of the study was to establish quantitative measures of those interrelationships and to interpret the economic significance of the interrelationships.

The method adopted to establish these interrelationships was the basic Leontief input-output model using linear and homogeneous production functions. The Leontief model involved four mathematical procedures. First, the flow table was constructed to show how and to what extent goods and services were distributed in the Tennessee economy. Second, a matrix of technical coefficients was computed to demonstrate the input-structures of all producing sectors. Third, a matrix of interdependence coefficients was computed in order to measure direct and indirect relationships between all sectors. And fourth, unit and weighted final demand multipliers were computed to measure sectorial influence on the state and regional economies.

This study used two variations of the Leontief input-output model. The first model was a statewide model defining thirty-four intermediate sectors and five final demand sectors. The second variation was an interregional model which divided the State of Tennessee into three regions: east, middle, and west. The interregional model included nineteen intermediate sectors and eleven final demand sectors.

The statewide and interregional flow tables revealed that goods and services produced by intermediate producing sectors in the state flow more westward than eastward. The flow tables also revealed that the Tennessee economy is final demand orientated. The statewide and interregional technical coefficients implied that manufacturing and service sectors in the state imported a large part of their inputs; a result which coincided with the implications of the flow tables. The interdependence coefficients revealed that the intermediate producing forces in the state are not extensively linked together. Neither direct nor indirect relationships were, in general, very great. But there was some measurable indirect relationship between all sectors in the economy. The unit multipliers revealed that primary agriculture and agricultural processing sectors had larger unit multipliers, in general, than manufacturing and service sectors. However, manufacturing and service sectors, in general, had larger weighted final demand multipliers than primary agriculture and agricultural processing sectors.

The general conclusion of the study was that the role played by agriculture in the state economy would be grossly underestimated if only direct interrelationships were taken into consideration.

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CHAPTER I

GENERAL DESCRIPTIONS OF THE TENNESSEE MODELS

I. INTRODUCTION

One of the major problems in the phenomenon of economic growth is the problem of interrelationships. The most discussed of these interrelationships is that which exists between agriculture and industry. It is recognized by some researchers that, because of the growing commercialization of our national economy, the economic interrelationships between agriculture and industry are not as apparent as they were in past years. Commercialization increases the complexity and diversity of the economy.

The ultimate goal of this study is to develop a set of estimates of sector interrelationships which will provide some of the basic information needed to understand regional economic development. This information is essential in understanding the role of agriculture in the total economy.

Estimates of sector interrelationships are useful to both public and private planners interested in economic development. For example, the management of a farm supply store may desire to know the economic effect of a 10 percent increase in the production of cotton on the demand for cotton harvesting machines. A farmer might wish to know what the influence of an increase in the sale of agricultural chemicals would be on the production of agricultural products. A city or regional planner

may desire to know what economic effect a new farm machinery plant would have in the total economy.

There are four major types of information provided by this study which can be helpful to all persons concerned with any phase of economic development in the State of Tennessee. First, the flow table describes how and to what extent the products produced in Tennessee move through the economy. This information provides the producers with information and knowledge about the directional flows of products. The flow table also provides the input-structure of each producing sector. Second, the technical coefficient table provides producers with estimates of sector interdependence. For example, the management of a food processing plant may desire to know the direct relationship between his industry and the agricultural chemicals industry. This information is provided by a technical coefficient. Third, the interdependence coefficients provide producers with estimates of both direct and indirect interdependence. The same management of the food processing plant above may desire to know how and to what extent an increase in the final demand for tin ore affects the output of processed food. Even though there is no direct relationship between the tin ore producer and the processed food producer, there is an indirect interrelationship which the interdependence coefficient would measure. And fourth, the multipliers provide estimates of sector influence upon the total economy. The above management of the food processing plant may desire to know how total sales in the state

economy would be affected by an increase in his own sales. The multiplier provides the basis for such an estimate.

Objectives

The principal objective of this study is to establish quantitative interrelationships among the major producing sectors within the State of Tennessee, with major emphasis on the interrelationships between agricultural and nonagricultural sectors.

Specific objectives that fall within the major objective are:

1. To formulate a precise model of the producing sectors of the State of Tennessee in which various interrelationships can be determined.

2. To provide estimates of agricultural sector interrelationships and to interpret the meaning and significance of the interrelationships within the context of the development of the Tennessee economy.

Historical Development of Interindustry Model

The Physiocrats were the first contributors to the development of interindustry economics. The Physiocrats developed the first model which analyzed the complete economy.[1] Quesnay's model was similar to present day models in that Quesnay's "Tableau Economique" had productive, service, and final demand sectors. Walras contributed much to the mathematical foundation of interindustry economics.[2] The type of interindustry model

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[1] A. Phillips, "The Tableau Economique as a Simple Leontief Model," Quarterly Journal of Economics, LXIX (February, 1955), 317-354.

[2] Leon Walras, Elements of Pure Economics, translated by W. Jaffe (Homewood, Illinois: Richard Irwin, Inc., 1954).

used in this study was developed by Wassily W. Leontief in 1941.[3] Leontief applied modern mathematical techniques to the Walrasian framework and developed a forty-four sector matrix for the U. S. economy. The basic Leontief methodology has been used frequently since its first application.

In recent years, the Leontief input-output analysis has been applied to regional and state studies. The Martin and Carter California model emphasized agriculture.[4] The Iowa State regional model emphasized agriculture.[5] An input-output analysis for the State of Oklahoma for the year 1959 has just recently been completed by Doeksen and Little.[6]

II. THE INTERINDUSTRY MODEL

The input-output models used in this study present the relationships among industries in its simplest form: that is, by linear relations and direct proportionality. The unit of measurement used is dollars. Money is used because it is a common value that can represent the volume of the interchange of commodities and services among industries.

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[3]Wassily Leontief, The Structure of the American Economy, 1919-1939 (second edition; New York: Oxford University Press, 1951).

[4]William E. Martin and Harold O. Carter, A California Interindustry Analysis Emphasizing Agriculture, Giannini Foundation Research Report, No. 250 (Berkeley: University of California, February, 1962).

[5]G. A. Peterson and Earl O. Heady, Application of Input-Output Analysis to a Simple Model Emphasizing Agriculture, Iowa Agricultural Experiment Station Bulletin, No. 427 (Ames: Iowa State, April, 1955).

[6]Gerald A. Doeksen and Charles H. Little, An Input-Output Model for Regional Economic Development Research, Oklahoma State Agricultural Experiment Station, Processed Series P-577 (Stillwater: Oklahoma State, November, 1967).

The basic model is an open Leontief input-output model representing flows of gross output. The model is called an "open" model because the final demand sectors (the Y's) do not enter into the linear relationship. These final demand sectors are exogenous in the model. A "closed" model would include all endogenous sectors, and all sectors would enter into the linear relationship. The open model is used because it is generally concluded that input-output coefficients are not stable for final demand sectors over any extended period of time.

The use of the term "gross" output implies that the total output of each producing sector is accounted for in the model: that is, the flow entry x_{ij}, where $i = j$, is included in the linear relationships. This means that goods and services sold by one sector to its own sector are included in the flow table. Exclusion of x_{ij}, where $i = j$, implies that only net output is included in the linear relationships.

The Flow Table

The first step in deriving a matrix for a mathematical interindustry study is to construct a flow table. The flow table shows the shipments of commodities from one sector to other sectors in the model. Table I-1 represents such a table in schematic form. Sectors can be chosen by the researcher according to personal preference, or they can be dictated by available data or geographical producing characteristics. Flows can be stated in either producers' or purchasers' values.[7]

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[7]The difference between the producers' and purchasers' value is the margin that occurs in trade sectors between the sale of the good by the producer and the buying of the good by the ultimate purchaser.

TABLE I-1

THE FLOW TABLE

Producing Sectors	Purchasing Sectors 1	2	3..... j.....	n	Final Demand Y	Gross Output X
1	x_{11}	x_{12}	x_{13} ... x_{1j} ...	x_{1n}	Y_1	X_1
2	x_{21}	x_{22}	x_{23} ... x_{2j} ...	x_{2n}	Y_2	X_2
3	x_{31}	x_{32}	x_{33} ... x_{3j} ...	x_{3n}	Y_3	X_3
.	.	.	. . . . .	.	.	.
i	x_{i1}	x_{i2}	x_{i3} ... x_{ij} ...	x_{in}	Y_i	X_i
.	.	.	. . . . .	.	.	.
m	x_{m1}	x_{m2}	x_{m3} ... x_{mj} ...	x_{mn}	Y_m	X_m

NOTE: $m = n$

Producers' value is used in this study since value to the purchaser eliminates the need to allocate the margin between producers' value and purchasers' value to the trade and transportation sectors. The intermediate activities of trade and transportation are not included in the analysis. The flow table is described mathematically below.

Let X represent the flow of goods among sectors in dollar values, i represent producing sectors (i = 1 to m), j represent purchasing intermediate sectors (j = 1 to n), and y represent final demand goods. Then,

$$
\begin{aligned}
X_1 &= x_{11} + x_{12} + x_{13} + \dots + x_{1j} + \dots + x_{1n} + Y_1 \\
X_2 &= x_{21} + x_{22} + x_{23} + \dots + x_{2j} + \dots + x_{2n} + Y_2 \\
X_3 &= x_{31} + x_{32} + x_{33} + \dots + x_{3j} + \dots + x_{3n} + Y_3 \\
&\;\vdots \\
X_i &= x_{i1} + x_{i2} + x_{i3} + \dots + x_{ij} + \dots + x_{in} + Y_i \\
&\;\vdots \\
X_m &= x_{m1} + x_{m2} + x_{m3} + \dots + x_{mj} + \dots + x_{mn} + Y_m
\end{aligned} \tag{1}
$$

where X_m is the output of sector m, x_{ij} is the output of sector i purchased by sector j, and Y_m is the final demand for the output of sector m. System (1) has m equations in mn + m unknowns. In order to solve the system, it is necessary to make an assumption regarding the nature of the relationship between the producing and purchasing sectors.

The assumption used here is that the relationship between producing and purchasing sectors is a linear and homogeneous function, i.e., the production coefficient for all sectors is constant for the time period being analyzed.

Matrix of Technical Coefficients

The next stage in the development of an interindustry analysis is, therefore, the derivation of production or technical coefficients. This stage represents a direct extension of the flow tables, and the extension reflects the assumption that there is a linear relationship between the producing sectors and the endogenous purchasing sectors.

In mathematical terms, the above assumption can be written:

(2a) $$x_{ij} = a_{ij}X_j + c_{ij}$$

Assuming that $c_{ij} = 0$, we get:

(2b) $$a_{ij} = \frac{x_{ij}}{X_j}$$

where a_{ij} is the technical coefficient between i producer and j purchaser, x_{ij} is the amount of j's purchase from i, and X_j is the total inputs of sector j.

The technical coefficients serve the purpose of a common denominator, in that it quantifies all relationships. Each a_{ij} represents the dollar value of the product of sector i required by sector j per unit of output of sector j.

Although technical coefficients are useful to the researcher in many ways, in that they reveal information themselves, they are not the results we are seeking in this study. Technical coefficients may be used to estimate the direct effects of a change in output of any sector j upon the sectors supplying the inputs to sector j. But technical coefficients can only measure the direct relationship among sectors.

Matrix of Interdependence Coefficients

Since the measurement of both direct and indirect relationship among sectors is the primary purpose of this study, it is necessary to extend the matrix of direct coefficients. The first step in the extension of the direct matrix is to rewrite system (1) as:

$$
\begin{aligned}
X_1 - x_{11} - x_{12} - x_{13} - \cdots - x_{1j} - \cdots - x_{1n} &= Y_1 \\
X_2 - x_{21} - x_{22} - x_{23} - \cdots - x_{2j} - \cdots - x_{2n} &= Y_2 \\
X_3 - x_{31} - x_{32} - x_{33} - \cdots - x_{3j} - \cdots - x_{3n} &= Y_3 \\
\cdots \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad \cdots & \\
X_i - x_{i1} - x_{i2} - x_{i3} - \cdots - x_{ij} - \cdots - x_{in} &= Y_i \\
\cdots \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad \cdots & \\
X_m - x_{m1} - x_{m2} - x_{m3} - \cdots - x_{mj} - \cdots - x_{mn} &= Y_m
\end{aligned}
\tag{3}
$$

In the next process, the a_{ij}'s of the technical matrix are substituted into the set of equation in (3):

$$
\begin{aligned}
&X_1 - a_{11}X_1 - a_{12}X_2 - a_{13}X_3 - \dots - a_{1j}X_j - \dots - a_{1n}X_n = Y_1 \\
&X_2 - a_{21}X_1 - a_{22}X_2 - a_{23}X_3 - \dots - a_{2j}X_j - \dots - a_{2n}X_n = Y_2 \\
&X_3 - a_{31}X_1 - a_{32}X_2 - a_{33}X_3 - \dots - a_{3j}X_j - \dots - a_{3n}X_n = Y_3 \\
&\quad\vdots \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \qquad (4) \\
&X_i - a_{i1}X_1 - a_{i2}X_2 - a_{i3}X_3 - \dots - a_{ij}X_j - \dots - a_{in}X_n = Y_i \\
&\quad\vdots \\
&X_m - a_{m1}X_1 - a_{m2}X_2 - a_{m3}X_3 - \dots - a_{mj}X_j - \dots - a_{mn}X_n = Y_m
\end{aligned}
$$

This system of equations (4) rewritten yields:

$$
\begin{bmatrix}
1 - a_{11} & - a_{12} & - a_{13} \dots\dots & - a_{1j} \dots\dots & - a_{1n} \\
- a_{21} & 1 - a_{22} & - a_{23} \dots\dots & - a_{2j} \dots\dots & - a_{2n} \\
- a_{31} & - a_{32} & 1 - a_{33} \dots\dots & - a_{3j} \dots\dots & - a_{3n} \\
\vdots & \vdots & \vdots & \vdots & \vdots \\
- a_{i1} & - a_{i2} & - a_{i3} \dots & 1 - a_{ij} \dots\dots & - a_{in} \\
\vdots & \vdots & \vdots & \vdots & \vdots \\
- a_{m1} & - a_{m2} & - a_{m3} \dots\dots & - a_{mj} \dots & 1 - a_{mn}
\end{bmatrix}
\cdot
\begin{bmatrix} X_1 \\ X_2 \\ X_3 \\ \vdots \\ X_i \\ \vdots \\ X_m \end{bmatrix}
=
\begin{bmatrix} Y_1 \\ Y_2 \\ Y_3 \\ \vdots \\ Y_i \\ \vdots \\ Y_m \end{bmatrix}
\qquad (5)
$$

In matrix notation (5) becomes:

(6a) $$(I - A)X = Y$$

where X = m · 1 column vector of outputs and (I - A) is the "Leontief Matrix" which is composed of an identity matrix minus the matrix of technical coefficients of dimensions m · n; and Y = m · 1 column vector of final demands.

The solution of the set of equations in (5) is obtained by finding the inverse of the Leontief Matrix. The solution is mathematically assured since the Leontief Matrix has the special properties of positive diagonal elements and negative nondiagonal elements. The solution appears in (7).

(7)
$$\begin{bmatrix} X_1 \\ X_2 \\ X_3 \\ \cdot \\ X_i \\ \cdot \\ X_m \end{bmatrix} = \begin{bmatrix} a_{11} & a_{12} & a_{13} \cdots a_{1j} \cdots a_{1n} \\ a_{21} & a_{22} & a_{23} \cdots a_{2j} \cdots a_{2n} \\ a_{31} & a_{32} & a_{33} \cdots a_{3j} \cdots a_{3n} \\ \cdot & \cdot & \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \\ a_{i1} & a_{i2} & a_{i3} \cdots a_{ij} \cdots a_{in} \\ \cdot & \cdot & \cdot \quad \cdot \quad \cdot \quad \cdot \quad \cdot \\ a_{m1} & a_{m2} & a_{m3} \cdots a_{mj} \cdots a_{mn} \end{bmatrix} \cdot \begin{bmatrix} Y_1 \\ Y_2 \\ Y_3 \\ \cdot \\ Y_i \\ \cdot \\ Y_m \end{bmatrix}$$

In matrix notation (7) becomes:

$$X = (I - A)^{-1} \cdot Y \tag{8a}$$

where $(I - A)^{-1}$ is the inverse of the Leontief Matrix. Each element of the $(I - A)^{-1}$ matrix indicates the total amount of production from sector i necessary to sustain a one unit final demand in sector j.

Multipliers

The output multiplier for each sector measures the direct and indirect change in total output resulting from a per unit change in final demand for the products of that sector. Multipliers are computed directly from the interdependence coefficients. The matrix of interdependence coefficients is multiplied by the one unit output change assumed in any particular sector. For example, let the final demand for sector X_1 increase by one dollar. Substituting this change into equation (7) yields:

$$\begin{bmatrix} a_{11} & a_{12} & a_{13} & \cdots & a_{1j} & \cdots & a_{1n} \\ a_{21} & a_{22} & a_{23} & \cdots & a_{2j} & \cdots & a_{2n} \\ a_{31} & a_{32} & a_{33} & \cdots & a_{3j} & \cdots & a_{3n} \\ \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\ a_{i1} & a_{i2} & a_{i3} & \cdots & a_{ij} & \cdots & a_{in} \\ \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\ a_{m1} & a_{m2} & a_{m3} & \cdots & a_{mj} & \cdots & a_{mn} \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 0 \\ 0 \\ \cdot \\ 0 \\ \cdot \\ 0 \end{bmatrix} = \begin{bmatrix} a_{11} \\ a_{21} \\ a_{31} \\ \cdot \\ a_{i1} \\ \cdot \\ a_{m1} \end{bmatrix} \tag{8}$$

The multiplier is found by summing the elements in the product vector of (8):

$$a_{11} + a_{21} + a_{31} + \ldots + a_{i1} + \ldots + a_{m1} = \sum_{m=1}^{m} a_{m1} \quad .$$

The multiplier indicates that a one dollar increase in final demand for output of sector X_1 will increase output in all sectors by an amount equal to $\sum_{m=1}^{m} a_{m1}$. Therefore, it is possible to calculate m - number of multipliers or a multiplier for each intermediate sector. For example, the researcher may want to determine the effect of a 2 percent change in the final demand for farm machinery on the output of cotton. The effect of final demand changes on employment of other sectors can be determined once employment-output ratios are established. More will be said about these effects later.

The independence coefficients can also be used to calculate the input requirements needed to meet an estimated final demand. The matrix of interdependence coefficients is multiplied by the estimated final demand for any particular sector. The process shows the amount of output of other sectors that will be needed for inputs for the given sector to produce its estimated final demand.

Assumptions and Limitations of Interindustry Analysis

The Leontief input-output analysis contains two basic assumptions. The first and most restrictive of these is the assumption that input-output coefficients are fixed during any given time period. This assumption is a crucial one because of the many implications that are involved.

One such implication is that technology remains constant over the time period studied. Any significant shift in the technological function would change the production coefficients considerably, making old coefficients useless for prediction purposes. Another implication of the constant input-output coefficients assumption is that no external economies or diseconomies are present, a situation that would not likely exist in all sectors of the economy. An additional weakness of the constant input-output coefficients is that no adjustments can be made for substitution possibilities due to changes in relative prices. Of course, no consideration is given to the availability of new materials which could reduce production cost. Because of these limitations associated with the assumption of fixed coefficients, the use of the Leontief input-output model as a long-range forecasting technique is greatly limited. The model is useful in describing the interrelationships between producing and purchasing sectors that exist at a given time. In effect, the model is a picture which gives a static view of the intricacies of exchange in an economic system.

The second basic assumption of the Leontief input-output model is that there are no errors of aggregation in combining industries into sectors. Each sector should contain industries which produce products that are homogeneous in type. This means that two different sectors could not produce the same product; nor could one sector produce joint products. These assumptions are necessary in order to establish representative coefficients. All models should be tested for validity. But one should not, when assessing limitations, overlook the value of the

final results of the model. It is the validity of the results, and not the limitations of the assumptions, that measures the success of any model.

III. MODEL I: THE STATEWIDE MODEL

Formulation

Model I is identical to the interindustry model described in Section II above. It is an aggregated model of the State of Tennessee. In Model I the flow table as shown in the system of equation in (1) would appear as:

$$
\begin{aligned}
X_1 &= x_{11} + \cdots + x_{1\,34} + Y_1 \\
&\vdots \qquad\qquad \vdots \qquad\qquad \vdots \\
X_{34} &= x_{34\,1} + \cdots + x_{34\,34} + Y_{34}
\end{aligned}
\tag{9}
$$

which implies there are thirty-four intermediate sectors in the model.

The determination of technical coefficients, interdependence coefficients, and various multipliers follows the same procedure as described in Section II above.

Sector Classification

One of the important characteristics of an input-output analysis is the freedom that can be utilized in sector division. Sectors were classified in this analysis for the purpose of emphasizing the role of agriculture in the state economy. The basic sectors were conceived to

show the interdependence between agriculture, agricultural processing, and the nonagricultural industries. Tennessee sectors are classified and defined in Table I-2.

There are thirty-four intermediate sectors and five final demand sectors or exogenous sectors. There are four major divisions of the intermediate sectors:

1. Primary agriculture: includes sectors 1-11. These sector classifications follow closely those of the Department of Agriculture's study of agriculture's transactions with industry in 1955.[8]

2. Agricultural processing: includes sectors 12-16. These sectors are generally comparable to the Bureau of Labor Statistics' 1947 Sector Classification which follows the Standard Industrial Classification Codes.[9]

3. Manufacturing and Mining: includes sectors 17-28. These sectors follow the Standard 2-Digit Industrial Classification Codes with one exception. Agricultural chemicals, which is a SIC 3-digit code, is classified as a separate sector outside of chemicals and allied products, a 2-digit code.

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[8]U. S. Department of Agriculture, Agricultural Marketing Service, Farm Income Branch, Agricultural Industrial Relations Study, 1955 (Washington: Government Printing Office, January 1959). Mimeographed working material.

[9]U. S. Department of Labor, Bureau of Labor Statistics, General Explanation of the 200 Sector Tables: The 1947 Interindustry Relations Study, BLS Report, No. 33 (Washington: Government Printing Office, March 1953).

TABLE I-2

CLASSIFICATION OF TENNESSEE SECTORS

Tennessee Sector No.	Title of Sector and Contents
1	Meat Animals and Products (beef, hogs, sheep, lambs, and wool)
2	Poultry and Eggs (chickens, eggs, broilers, turkeys, and hatcheries)
3	Farm Dairy Products (milk, cream, and meat from dairy calves)
4	Food and Feed Grains (corn, wheat, oats, barley, rye, silage and forage, soybeans, and sorghum)
5	Cotton (cotton and cottonseed)
6	Tobacco
7	Fruits and Nuts (strawberries, apples, peaches, other fruits and nuts)
8	Vegetables (snapbeans, tomatoes, sweet potatoes, Irish potatoes, cabbage, and miscellaneous vegetables)
9	Forage Crops (hay and pasture)
10	Forest Products (sawlogs, fuelwood, pulpwood, and all others)
11	Miscellaneous Agriculture (honey and beeswax; legumes and grass seeds; greenhouse and nursery products; horses, mules, and goats; and miscellaneous crops)
12	Grain Mill Products (flour and meal, prepared feeds, cereal breakfast foods, blended and prepared flour)

TABLE I-2 (continued)

Tennessee Sector No.	Title of Sector and Contents
13	Meat and Poultry Processing (meat slaughtering plants, meat processing plants, poultry dressing plants, and meat packing)
14	Dairy Products (natural and processed cheese, condensed and evaporated milk, ice cream and frozen desserts, fluid milk, and other dairy products)
15	Canned and Frozen Foods (canned fruits and vegetables, and frozen fruits and vegetables)
16	Miscellaneous Agricultural Processing (cottonseed oil mills, soybean oil mills, animal and marine fats and oils, roasted coffee, manufactured ice, food preparations, and others)
17	Tobacco Manufactures (all tobacco manufacturing plus stemming and redrying)
18	Textile and Apparel (SIC 22 and 23)
19	Lumber and Wood Products (SIC 24)
20	Furniture and Fixtures (SIC 25)
21	Paper and Allied Products (SIC 26)
22	Chemicals and Allied Products (SIC 28 except 287)
23	Agricultural Chemicals (SIC 287)
24	Primary Metal Industries (SIC 33)

TABLE I-2 (continued)

Tennessee Sector No.	Title of Sector and Contents
25	Fabricated Metals (SIC 34)
26	Machinery and Transportation Equipment (SIC 35, 36, and 37)
27	Other Manufacturing (SIC 19, 27, 29, 30, 31, 32, 38, and 39)
28	Mining (SIC 10, 11, 12, 13, and 14)
29	Services and Utilities (agricultural services, personal services, business services, sanitary services, and all utilities)
30	Wholesale and Retail Trade
31	Transportation and Communications
32	Finance, Insurance, and Real Estate
33	TVA
34	Construction
35	Unallocated
36	Business Investment
37	State and Local Government
38	Federal Government
39	Households
40	Exports

4. Service: includes sectors 29-35. Data sources necessitated a departure or consolidation of SIC Classifications for sectors in this grouping. Sector classification coincides with that found in the University of Tennessee's Business and Economic Research Report.[10]

The final demand section includes five exogenous sectors: business investment, state and local government, federal government, household, and exports. Business investment expenditures include all purchases of durable goods which are not completely used up in the production of 1963 output. Household includes both capital expenditures and noncapital expenditures. Exports include sales to the rest of the United States and exports to the rest of the world. State and local governments expenditures are combined into one sector.

Estimation Procedures

The first step involved in formulating a flow table is to estimate gross domestic output for each sector. Gross output for sectors in the Tennessee statewide model were estimated as follows:

Primary agricultural sectors. Values of gross outputs for primary agricultural sectors were obtained from Tennessee Agricultural

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[10]Tong Hun Lee, John R. Moore, and David P. Lewis, A Report on the Tennessee Interindustry Study, Center for Business and Economic Research, College of Business Administration (Knoxville: University of Tennessee, August 1967).

Statistics.[11] Gross output consists of cash receipts, value of home consumption, and value of inventory change.

Agricultural processing sectors. Values of shipments for agricultural processing sectors were obtained from U. S. Census of Manufactures.[12] If figures were not available, values were estimated by assuming shipments were proportional to employment on a regional basis. Value of inventory change was added to value of shipment. Value of inventory change was estimated from U. S. totals by assuming state inventory change was in the same proportion to state value of shipments as U. S. inventory change was to U. S. value of shipment. Hence, gross output equals value of shipments plus inventory change minus transfers-in.

Manufacturing sectors. Estimates of gross domestic output for manufacturing sectors in 1963 were obtained from Census of Manufactures using the same procedure as used in agricultural processing.

Mining sector. Gross domestic output for the mining sector was obtained from Minerals Yearbook 1963.[13]

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[11]Tennessee Department of Agriculture, Crop Reporting Service, Tennessee Agricultural Statistics, Annual Summary, 1965 (Nashville: September 1965).

[12]U. S. Department of Commerce, Bureau of the Census, United States Census of Manufactures, 1963, Vol. III (Washington: Government Printing Office, 1966).

[13]U. S. Department of the Interior, Bureau of Mines, Minerals Yearbook 1963 (Washington: Government Printing Office, 1964).

Service sectors. Gross output of selected services was obtained from Census of Business.[14] Gross outputs for unallocated services were derived from estimates based on USDA's 1955 study and BLS's 1947 study.[15] Electric power output was obtained from Federal Power Commission Statistics.[16] Natural and mixed gas output was estimated from Statistical Abstract of the United States.[17]

Wholesale and retail trade sector. Gross domestic outputs for both wholesale and retail trade sectors were calculated from estimates of marketing margins. Gross output for trade was estimated as follows:

1. Trade inputs to each sector were estimated by applying technical coefficients from the 1955 USDA study and the 1947 BLS study to all sectors in order to find inputs to each individual sector. It was assumed that the value of trade inputs to each sector per unit of output was the same for Tennessee sectors as for the United States in 1947 and 1955.

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[14]U. S. Department of Commerce, Bureau of the Census, United States Census of Business, 1963, Vol. III (Washington: Government Printing Office, 1966).

[15]U. S. Department of Labor, Bureau of Labor Statistics, Division of Interindustry Economics, The 1947 Interindustry Relations Study, Tables I, II, and III (Washington: Government Printing Office, December, 1952).

[16]Federal Power Commission, Office of Accounting and Finance, Statistics of Electric Utilities in the United States, 1963: Privately Owned; Publicly Owned, FPC S-168; FPC S-170 (Washington: Government Printing Office, 1965).

[17]U. S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 83rd ed. (Washington: Government Printing Office, 1965).

2. It was assumed that the total value of output of the trade sector increased at the same annual rate from 1954 to 1963 as from 1947 to 1954.

3. An estimate of total trade inputs to all sectors was computed by adding the sum of the adjusted margin inputs to all sectors.

4. Once the estimate of total trade output had been obtained, output was distributed by the use of percentages computed from the Lee, Moore, and Lewis data.

Transportation and communication. Estimates of transportation margins and total output were obtained from USDA 1955 study and BLS 1947 study using the procedure discussed above for the trade sector. Output of telephone companies was obtained from Federal Power Commission statistics. Output for telegraph industry was estimated from Statistical Abstract by assuming Tennessee telegraph revenues were in proportion to United States telegraph revenues as state telephone revenues were to United States telephone revenues.

Finance, insurance, and real estate. Tennessee output for the finance, insurance, and real estate sector was estimated from employment data by applying USDA and BLS technical coefficients. It was assumed that finance, insurance, and real estate production costs were the same for Tennessee sectors per dollar of output as for the United States sectors. These coefficients were applied to 1963 figures and summed to get dollar value of output for the sector. Once the gross output

figure was obtained, output was distributed by percentages computed from the Lee, Moore, and Lewis data.

TVA. Gross output for the TVA sector was estimated from Federal Power Commission statistics.

Construction. The value of total maintenance construction was estimated from U. S. Department of Commerce and U. S. Department of Labor data.[18] Total value is given for the U. S. only. Tennessee new construction was assumed to have the same percent of U. S. new construction total in 1963 as in the 1951 total.

Given the estimates of gross output for each producing sector in 1963, the intersectorial flows of goods and services were estimated as follows.

Distribution of agricultural products. Flows for producing sectors 1-17 of the statewide model were estimated from USDA's 1955 study when secondary data for 1963 were not available, or when estimates could not be acquired from other sources. The general procedure used in estimating inputs for the agricultural sectors was as follows: (1) estimates of technical coefficients were taken from USDA's 1955 study for the U. S. economy, (2) these coefficients were applied to 1963 Tennessee control totals to derive the value of input purchases by sector, and

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[18] U. S. Department of Commerce, Bureau of the Census, and U. S. Department of Labor, Construction Review, Vol. I (Washington: March, 1964).

(3) these sector input estimates were adjusted to the technical coefficients established by the Lee, Moore, and Lewis study.

Industry to industry flows. Flows for the industrial sectors were estimated from the Lee, Moore, and Lewis study as follows: (1) total employment for each sector was divided by the amount of employment attributed to each purchasing sector, (2) these percentages were adjusted to a 100 percent total, and (3) the adjusted percentages were multiplied by 1963 state total sales for each sector to derive the intersectorial flows in dollars and cents. There were two basic assumptions made in this procedure. First, it was necessary to assume a linear relationship between employment and output in a sector. Second, it was assumed that technical coefficients were constant from 1963 to 1964.

Service distributions. Flows for the service sectors were estimated from BLS's 1947 study using the procedure described on page 21 when secondary data for 1963 were not available. Technical coefficients from the Lee, Moore, and Lewis study were used to distribute the output of the service industries to nonagricultural sectors. Technical coefficients from USDA's 1955 study were used to distribute the output of the service industries to agricultural sectors.[19]

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[19]The basic source for the statewide flow table was the Lee, Moore, and Lewis study. The author estimated the agricultural flows from secondary data; however, the Lee, Moore, and Lewis study provided checks for the agricultural flows.

IV. MODEL II: THE INTERREGIONAL MODEL

Formulation

Model II presents a spatial disaggregation of Model I. The State of Tennessee is divided into three distinct regions: East, Middle, and West. Figure 1 shows the regional division of the state in Model II.[20]

While Model I contained thirty-four intermediate sectors and five final demand sectors, Model II contains nineteen intermediate sectors and eight final demand sectors. The form in which regional data was available made it necessary to aggregate some sectors. Sectors 1-3 in Model I are combined into sector 1 in Model II, representing livestock; sectors 4-11 of Model I make up sector 2 in Model II, representing crops and other agricultural production; sectors 12-17 of Model I make up sector 3 of Model II, representing agricultural processing; and sectors 22 and 23 of Model I are combined to make sector 22 of Model II, representing all chemical and plastic products. Other sectors in Model II are identical to those which carry the same sector number in Model I.

The Flow Table

The interregional flow table is a mathematical expansion of the system of equations (1). The use of superscripts e for east, m for middle, and w for west designate regions of production and sales. The disaggregation of equations (1) for use in Model II becomes:

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[20] This regional division of the state follows the regional division adopted by Lee, Moore, and Lewis.

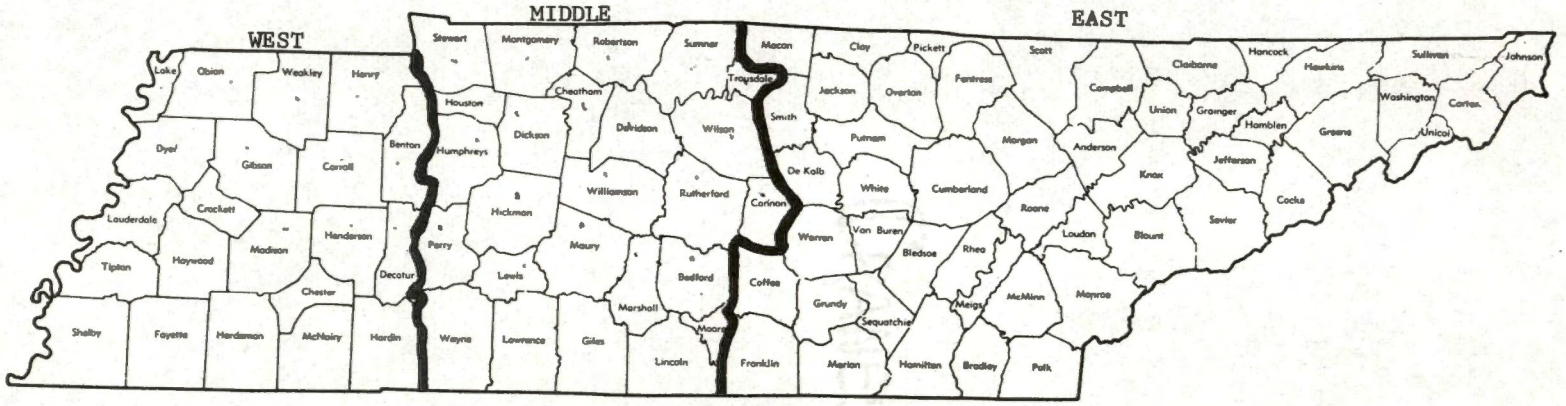

Figure 1. Geographical sectoring for Model II.

$$X_i^e = X_i^e + X_i^m + X_i^w + Y_i^e \quad Y_i^m + Y_i^w$$

where

$$X_i^e = x_{ij}^{ee} + x_{ij}^{em} + x_{ij}^{ew} + y_{ij}^{ee} + y_{ij}^{em} + y_{ij}^{ew}$$

(10)
$$X_i^m = x_{ij}^{me} + x_{ij}^{mm} + x_{ij}^{mw} + y_{ij}^{me} + y_{ij}^{mm} + y_{ij}^{mw}$$

$$X_i = x_{ij}^{we} + x_{ij}^{wm} + x_{ij}^{ww} + y_{ij}^{we} + y_{ij}^{wm} + y_{ij}^{ww}$$

Interpretation of the x_{ij}'s is as follows: X_i is output of sector i for the state; X_i^e, X_i^m, and X_i^w is the output of sector i for respective regions (East, Middle, and West Tennessee); x_{ij}^{ew} is output of sector i to sector j from region e to region w, and so on.

Instead of one matrix as in Model I, Model II contains nine intermediate matrices, as shown below:

(11)
$$\begin{bmatrix} x_{ij}^{ee} & x_{ij}^{em} & x_{ij}^{ew} \\ x_{ij}^{me} & x_{ij}^{mm} & x_{ij}^{mw} \\ x_{ij}^{we} & x_{ij}^{wm} & x_{ij}^{ww} \end{bmatrix}$$

Matrix of Technical Coefficients

Likewise, the matrix of technical coefficients has nine separate matrices:

(12)
$$\begin{bmatrix} a_{ij}^{ee} & a_{ij}^{em} & a_{ij}^{ew} \\ a_{ij}^{me} & a_{ij}^{mm} & a_{ij}^{mw} \\ a_{ij}^{we} & a_{ij}^{wm} & a_{ij}^{ww} \end{bmatrix}$$

Each a_{ij} shows the amount of output required of industry i of one region in response to one dollar's worth of output of industry j of one region. For example, a_{ij}^{ew} measures the amount of output required of industry i in region east to produce one unit of output in industry j located in the west region.

Matrix of Interdependence Coefficients

The solution of the interregional matrix follows the same general procedures as Model I. The solution of $X = AX - Y$ is $X = (I - A)^{-1}Y$. The interregional matrix of interdependence coefficients is written as:

(13)
$$\begin{bmatrix} A_{ij}^{ee} & A_{ij}^{em} & A_{ij}^{ew} \\ A_{ij}^{me} & A_{ij}^{mm} & A_{ij}^{mw} \\ A_{ij}^{we} & A_{ij}^{wm} & A_{ij}^{ww} \end{bmatrix}$$

The above interdependence coefficients are interpreted as follows: A_{ij}^{ee} shows the total requirement for products of eastern sector i per dollar of final demand for products of eastern sector j. A_{ij}^{em} shows the total requirements for products of eastern sector i per dollar of final

demand for products of middle sector j. A_{ij}^{ew} shows the total requirements for products of eastern sector i per dollar of final demand for products of western sector j. The other two rows of interdependence coefficients are interpreted likewise.

Multipliers

It is also possible to compute regional multipliers. Regional multipliers are computed as described in Model I, but they have different interpretations. For example, the multiplier $\sum_{i=1}^{i} A_{ij}^{ee} + \sum_{i=1}^{i} A_{ij}^{me} + \sum_{i=1}^{i} A_{ij}^{we}$ shows the total requirements of eastern sector i per dollar of final demand for products of western sector j. Other A_{ij}'s are interpreted similarly.

Another useful comparison between sectors is the weighted multiplier.[21] The weighted multiplier is also computed from the matrix of interdependent coefficients. But instead of changing final demand by one unit of measurement, final demand is weighted by a percentage change. The weighted multiplier could be written as:

$$(14) \qquad WM_i = \left(\sum_{i=1}^{i} A_{ij}^{ee} + \sum_{i=1}^{i} A_{ij}^{me} + \sum_{i=1}^{i} A_{ij}^{we} \right) \Delta Y_i$$

where ΔY_i represents a percentage change in final demand. The weighted multiplier not only measures the direct and indirect interdependence between sectors but also measures the impact of the size of final demand.

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[21] Martin and Carter, op. cit., p. 13.

CHAPTER II

EMPIRICAL RESULTS OF THE STATEWIDE MODEL

I. THE STATEWIDE FLOW TABLES

Tables A-1, A-2, and A-3, in Appendix A, summarize the inter-industry flow of goods and services in the Tennessee economy for the year 1963. Following the familiar format of a typical input-output table, it describes the distribution pattern of each sector's output among the intermediate and final demand sectors.

Row Entries

The entries in each row of Table A-1 represent the dollar value of goods and services sold by a producing sector to each of the purchasing sectors. The amount of sales from one producing industry to all purchasing industries is obtained by reading across the row. For example, by reading across the first row we can see that the meat animals and products producing sector sold goods valued at $140,189,000 to the meat and poultry processing industry (sector 13); $17,000 to miscellaneous agriculture processing (sector 16); $4,740,000 to business investment (sector 36); and $11,201,000 to households (sector 39). Column 41 contains the estimated gross domestic output for each producing sector. The gross domestic output for meat animals sector was $167,562,000 in the year 1963. The remaining thirty-four row entries may be interpreted similarly.

There are thirty-four producing sectors and forty purchasing sectors. The first thirty-four purchasing sectors represent sectors which are endogenous to the model, and the last five sectors are considered final demand sectors and exogenous. Business investment, state and local government, federal government, households, and exports are not entered in the model as producing sectors, thus these sectors are not listed in the row entires in Table A-1 (Appendix A).

Column Entries

The columns in Table A-1 represent purchasing sector's input-structures. For example, reading down column 1, meat animals purchased goods valued at $6,254,000 from food and feed grains (sector 4); $23,816,000 from forage crops (sector 9); $10,665,400 from grain mill products (sector 12); etc.

Summary of Flow Table

Table A-1 reveals some important characteristics about the distribution pattern of the Tennessee economy. You can note that the entries in the lower half of Table A-1 are more numerous than the upper half which contains the agricultural sectors.[1] The lack of entries in the primary agricultural sectors clearly indicates the weak relationship between primary agricultural sectors and nonagricultural sectors. The large number of entries in the manufacturing row and column sectors

[1] It should be pointed out here that different data sources were used for agricultural and nonagricultural sectors, which could account for a part of the variation in number of entries.

indicates a stronger interdependence of manufacturing intermediate sectors than agricultural related sectors, Agricultural processing sectors are dependent on both primary agricultural and manufacturing sectors for inputs; indicative of a large direct dependence. The intermediate sectors in the Tennessee flow table contain some 1,225 cells. The fact that less than half of these cells are occupied by a sales figure indicates that, in general, the Tennessee sectors are not closely interdependent.

The Condensed Flow Table

Table II-1 presents an aggregated view of Table A-1 (Appendix A). The interpretation of Table II-1 is similar to the interpretation of Table A-1. Firms in primary agriculture sold goods and services valued at $102,369,000 directly to other firms in the primary agricultural sector; $320,709,000 to firms in agricultural processing; $73,635,000 to firms in manufacturing and mining; and $307,652,000 to final demand sectors.

Table II-1 reveals the importance of the final demand sectors in the output-structure of each sector. As would be expected, most of the output of primary agriculture flows into the agricultural processing and final demand sectors. A large percent of the output of agricultural processing flows directly to final demand. The output-structure of manufacturing and mining reveals that both services and final demand sectors are the large purchasers of manufactured goods, a fact that again indicates how the Tennessee economy is open and final demand oriented. The output-structure of the service sectors is greatly

TABLE II-1

THE TENNESSEE FLOW OF GOODS AND SERVICES BY INDUSTRY GROUPS, TENNESSEE, 1963 (MODEL I)

Producing Industries	Purchasing Industries				
	Primary Agriculture	Agricultural Processing	Manufacturing and Mining	Services	Final Demand
	---------- Dollars ----------				
Primary Agriculture	102,369,000	320,709,000	73,635,000	a	307,652,000
Agricultural Processing	43,222,920	90,347,000	79,040,500	72,000,470	923,987,720
Manufacturing and Mining	22,752,580	15,232,230	184,591,680	208,469,980	4,327,403,710
Services	27,671,230	28,859,090	302,576,310	833,489,910	4,849,127,030

[a]Less than one million.

influenced by the large purchases by other service sectors, manufacturing sectors, and final demand.

II. THE STATEWIDE TECHNICAL COEFFICIENTS

The technical coefficients for Model I are found in Tables A-4, A-5, and A-6 (Appendix A). As described above in Chapter I, technical coefficients measure the amount of the output of industry i required to produce a unit of output of industry j . In more common terms, technical coefficients are used to measure the direct relationship among industries.

Each entry in Table A-4 shows the value of goods and services required from the row sector per dollar of output by the column sector. For example, reading down column 1 each dollar of output produced by the meat animals and products sector required the following purchases from other producing sectors: 3.7 cents from food and feed grains (sector 4); 14.2 cents from forage crops (sector 9); 6.4 cents from grain mill products (sector 12); .7 cents from chemical and allied products (sector 22); 1.2 cents from agricultural chemicals (sector 23); 1.9 cents from services and utilities (sector 29); .6 cents from wholesale and retail trade (sector 30); 1.1 cents from transportation and communication (sector 31); and .3 cents from finance, insurance, and real estate (sector 32). The other columns are interpreted likewise.

In interpreting the technical coefficients in Table A-4, it is necessary to remember that the model includes only Tennessee produced inputs. Some of the technical coefficients may appear small if that

fact is not taken into consideration. For example, consider the textiles and apparel column (18). A one dollar sale of goods produced by the textiles industry requires only 2.3 cents of purchases from the cotton industry (sector 5). The coefficient is low because a large percent of the cotton products purchased by the textile industry is imported from outside the state.

Table A-4 has the same number of interindustry transactions as Table A-1 (Appendix A, pages 123 and 120, respectively). The technical coefficients measure only the direct interdependence between sectors. As was noted in Table A-4 the direct interdependence between most intermediate sectors is relatively weak. The agricultural sectors have fewer transactions than manufacturing and service sectors, but the coefficients in the primary agricultural and agricultural processing sectors are usually larger than those found between other sectors.

Dependence of primary agricultural sectors on the industrial sectors in the Tennessee economy differs slightly between crop and livestock sectors. Livestock purchasing sectors have a greater variety of input requirements, but crop sectors have a greater requirement of manufacturing goods. Livestock sectors require more primary inputs while crop sectors require more secondary inputs.[2] Agricultural processing sectors are dependent on more producing sectors for direct inputs than any other industry group, which is an indication that the multiplier

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[2]Primary inputs are defined as those inputs which are purchased from intermediate producing sectors in the state. All other inputs are defined as secondary inputs.

effect generated by the agricultural processing sectors would be relatively high. A large number of technical coefficients in the input-structures indicates a strong direct interrelationship. The indirect dependence can be significant without a large direct dependence.

Table II-2 gives an aggregated view of the matrix of technical coefficients. Primary agriculture requires the following purchases per dollar of output: 12.6 cents from primary agriculture; 5.3 cents from agricultural processing; 2.8 cents from manufacturing and mining; and 3.4 cents from services.

Agricultural processing sectors require inputs from other producing sectors valued at 40 cents for every dollar of output as compared to 24 cents for primary agriculture, 12 cents for manufacturing and mining, and 18 cents for services. The fact that Tennessee produced inputs make up a small percent of total inputs implies, in general, that the state is a major importer of manufacturing and service inputs.

III. STATEWIDE INTERDEPENDENCE COEFFICIENTS

The technical coefficients measured only the direct relationships between two sectors. The interdependence coefficients measure the indirect relationships as well as the direct relationships. For example, the technical coefficients show how important farm chemicals are in the input-structure of agriculture. But the technical coefficients would not explain the dependence of the farm producer on sectors which supply inputs to the agricultural chemicals sector; interdependence coefficients would.

TABLE II-2

CONDENSED TABLE OF TECHNICAL COEFFICIENTS,
TENNESSEE, 1963 (MODEL I)

Producing Sectors	Producing Sectors			
	Primary Agriculture	Agricultural Processing	Manufacturing and Mining	Services
Primary Agriculture	.12603698	.28192661	.01547396	--
Agricultural Processing	.05321617	.07942160	.00166098	.01191711
Manufacturing and Mining	.02801303	.01339024	.03879086	.03450478
Services	.03406889	.02536924	.06358464	.13795459
Total Intermediate Inputs	.24133507	.40010769	.11951041	.18437648

There is a mathematical limitation which must be recognized before it is possible to relate the technical coefficients with the interdependence coefficients. The direct dependence described by the technical coefficients relate to a dollar change in the production of gross domestic output, regardless of its distribution. The indirect dependence described by the interdependence coefficients relate solely to changes in final demand sectors. The technical coefficients reflect changes in the endogenous system while the interdependence coefficients reflect changes in the total system, both in the endogenous and exogenous sectors.

It is possible to isolate the indirect dependence by reducing the interdependence coefficients by the propostion final demand is to output and subtracting the technical coefficients from the computed value. The ratios of indirect to direct dependence indicates the importance of the indirect effects compared to the corresponding direct effects.

Tables A-7, A-8, and A-9 (Appendix A) give the interdependence coefficients for Model I. Each coefficient shows the output required from sector i per dollar of output of sector j delivered to final demand. For example, a one dollar increase in the final demand for products of the meat animals and products sector (no. 1) generates the following increases in output of other endogenous sectors (reading down column 1 and interpreting coefficients in dollars and cents): $1.05 in meat animals and products (the one dollar increase is the original one dollar flow to final demand and the 5 cents is caused from induced purchases resulting from the first spending); 5.5 cents in food and feed

grains (sector 4); 14.3 cents in forage crops (sector 9); 7.0 cents in grain mill products (sector 12); .1 cent in dairy products (sector 14); 1.3 cents in agricultural chemicals (sector 23); and 1.7 cents in transportation and communication. There is a measurable influence on all endogenous sectors although small. But the fact that there is some indirect relationship between all sectors in the Tennessee economy indicates some interdependence in economic development.

A matrix of interdependence coefficients for four major industry groupings is presented in Table II-3. A one dollar increase in the output demand for primary agriculture would have the following effects: an increase in output of primary agriculture by $1.17, an increase in output of agricultural processing by 6.8 cents, an increase in output of manufacturing and mining by 3.7 cents, and an increase in output of services by 5.1 cents.

The largest intersectorial relationship is found between primary agricultural producing sector and agricultural processing purchasing sector (.3577953). A one dollar increase in the output of agricultural processing will induce a 35.8 cent increase in the output of primary agriculture. A large interdependence coefficient will usually imply a substantial economy multiplying effect.

Another interesting interrelationship is found between the primary agricultural producing sector and the primary agricultural purchasing sector. This coefficient is the largest intra-industry

TABLE II-3

CONDENSED TABLE OF INTERDEPENDENCE COEFFICIENTS, TENNESSEE, 1963 (MODEL I)

Producing Industries	Purchasing Industries: Primary Agriculture	Agricultural Processing	Manufacturing and Mining	Services
Primary Agriculture	1.1668570	.3577953	.0197824	.0057381
Agricultural Processing	.0681773	1.1076380	.0040352	.0154738
Manufacturing and Mining	.0367809	.0276083	1.0437850	.0421609
Services	.0508347	.0487736	.0778904	1.1638240

coefficient (the diagonal coefficients) which implies that the primary agricultural industry has a greater unit generating effect on its own industry than the other three industries have on their respective industries.

The primary agriculture-manufacturing and mining coefficient (.0197824) is smaller than the manufacturing and mining-primary agriculture coefficient (.0367809), implying that manufacturing sectors have a smaller unit generating effect upon primary agriculture than primary agriculture has on manufacturing; a conclusion that would not be expected.

IV. STATEWIDE MULTIPLIERS

We have defined the interdependence coefficient as a measurement which shows the output required of industry i to deliver one dollar's worth of products of industry j to final demand. Therefore, the summation of A_{ij}, where j = c, shows the total output required of all endogenous sectors in the state to deliver one dollar's worth of products of industry j to final demand. These summations are called multipliers because each output multiplier expresses the total change in the Tennessee gross domestic output induced by a percentage change in final demand for products of each industry.

There are two types of multipliers discussed below. The unit multiplier expresses the total change in the Tennessee gross domestic output induced by a one dollar change in final demand for products of each sector. The weighted multiplier expresses the total change in

the Tennessee gross domestic output induced by a 10 percent change in final demand for products of each sector.

Statewide Unit Multipliers

Table II-4 presents the size and rank of the thirty-four statewide unit multipliers. Meat and poultry processing had the largest unit multiplier (1.9722790) in the state. This multiplier says that a one dollar increase in the final demand for meat and poultry processing products will generate a total increase in the output of the economy of $1.97. An additional 97 cents is generated by the original dollar purchase through induced purchases.

There are several reasons for the large multiplier in the meat and poultry processing industry. The basic reason is that the majority of meat and poultry industry's inputs are purchased from other endogenous sectors. Column 13 of the Statewide Technical Coefficients Table (A-4, Appendix A) reveals that the meat and poultry processing industry purchased, for every dollar of output delivered to final demand, 69 cents from endogenous sectors as compared to 31 cents from exogenous sectors. Purchases from endogenous sectors would have a greater positive effect on the economy than purchases from exogenous sectors.

Another reason for the large multiplier associated with the meat and poultry processing industry is that the meat and poultry processing industry purchases a relatively high percent of Tennessee produced inputs. Imported inputs weaken the domestic economic effect while domestically produced inputs increase the total effect. Table A-1 (Appendix A)

TABLE II-4

RANK OF STATEWIDE UNIT MULTIPLIERS, TENNESSEE, 1963 (MODEL I)

Sector Number		Unit Multiplier	Rank
1	Meat Animals and Products	1.3558010	13
2	Poultry and Eggs	1.8245219	6
3	Farm Dairy Products	1.9495919	2
4	Food and Feed Grains	1.0433639	32
5	Cotton	1.1954874	18
6	Tobacco	1.0907649	27
7	Fruits and Nuts	1.8622761	5
8	Vegetables	1.0865989	28
9	Forage Crops	1.0081247	34
10	Forest Products	1.0101936	33
11	Miscellaneous Agriculture	1.6650689	9
12	Grain Mill Products	1.4047866	12
13	Meat and Poultry Processing	1.9722790	1
14	Dairy Products	1.2286484	16
15	Canned and Frozen Foods	1.7645852	7
16	Miscellaneous Agricultural Processing	1.1660287	21
17	Tobacco Manufactures	1.8706038	4
18	Textiles and Apparel	1.1222910	23
19	Lumber and Wood Products	1.1530945	22
20	Furniture and Fixtures	1.0734990	30
21	Paper and Allied Products	1.2004490	17
22	Chemicals and Allied Products	1.0775954	29
23	Agricultural Chemicals	1.9417826	3
24	Primary Metal Industries	1.1851255	19
25	Fabricated Metals	1.1018581	24
26	Machinery and Transportation Equipment	1.2423861	14
27	Other Manufacturing	1.1696664	20
28	Mining	1.0909865	26
29	Services and Utilities	1.4246318	11
30	Wholesale and Retail Trade	1.0924480	25
31	Transportation and Communication	1.0442606	31
32	Finance, Insurance, and Real Estate	1.6138996	10
33	TVA	1.2332926	15
34	Construction	1.7063476	8

shows the sizable purchases of the meat and poultry processing industry from meat animals and products, poultry and eggs, and farm dairy products.

The meat and poultry processing industry also generated a large amount of indirect purchases (Table A-4, Appendix A). As pointed out earlier, the total effect is composed of the direct plus the indirect effect. The meat and poultry processing industry generated 69 cents in direct effect, but it also generated $1.29 in indirect effects. This strong indirect effect indicates the diversity and size of the input-structure of the industry.

The input-structure of the suppliers of industry inputs are also important in one industry's total multiplier effect. For example, if the suppliers of the inputs for the meat and poultry processing industry have strong direct and indirect interrelationships with other producing sectors, the multiplier for the meat and poultry industry will be larger.

Farm dairy products, surprisingly, had the second largest unit multiplier (1.9495919). Farm dairy products industry did not have a wide complex of inputs but their weight was significant. Again, it was the size of the indirect effect which accounted for the large total multiplier. The interdependence coefficient (Table A-7, Appendix A, column 3) was larger than all corresponding technical coefficients (Table A-4) for the farm dairy products sector. This is an indication of the far reaching effect of the input-structure of farm dairy products.

As Table II-4, page 44, reveals, the agricultural sectors, both primary and processing, are, in general, ranked higher than

nonagricultural sectors. Forage crops and feed grains sectors were the lowest ranking agricultural sectors. Manufacturing sectors are ranked lower than both agricultural and service sectors, a fact which, again, points out that Tennessee manufacturers import many of their inputs.

Statewide Weighted Final Demand Multipliers

The unit multipliers discussed above showed the effect on the economy of a one dollar change in the final demand for each sector. But the unit multiplier did not measure the impact of the size of final demand contributions. The weighted multipliers weigh the sector's contributions to final demand including both direct and indirect interrelationships.

Table II-5 gives the weighted multiplier and rank of each sector. The multiplier, 2,161.28, for the meat animals and products sector (row 1) implies that a 10 percent increase in the final demand for meat animal products will generate $2,161,280 in the Tennessee gross domestic output of the intermediate sectors. These multipliers are ranked according to their total generating power.

The wholesale and retail trade sector multiplier, 265,334,130, was the state's largest multiplier in 1963. The wholesale and retail trade sector unit multiplier was low (25th), but its large final demand contribution moved the sector to the top when weighted because wholesale and retail trade carried the largest sector output in the state. Chemicals and plastics, another large output sector, had the second largest weighted multiplier (118,297,190). Textiles and apparel had the third

TABLE II-5

RANK OF STATEWIDE WEIGHTED FINAL DEMAND MULTIPLIERS, TENNESSEE, 1963 (MODEL I)

Sector Number	Sector Title	Weighted Final Demand Multiplier	Rank
1	Meat and Animals and Products	2,161.28	30
2	Poultry and Eggs	6,391.48	25
3	Farm Dairy Products	8,705.51	22
4	Food and Feed Grains	3,064.99	27
5	Cotton	11,268.91	20
6	Tobacco	5,277.56	26
7	Fruits and Nuts	307.65	33
8	Vegetables	929.04	32
9	Forage Crops	0.00	34
10	Forest Products	1,665.61	31
11	Miscellaneous Agriculture	2,232.52	29
12	Grain Mill Products	28,521.26	10
13	Meat and Poultry Processing	54,558.23	9
14	Dairy Products	16,596.21	18
15	Canned and Frozen Foods	7,559.57	24
16	Miscellaneous Agricultural Processing	24,748.83	14
17	Tobacco Manufactures	10,132.50	21
18	Textiles and Apparel	110,990.63	3
19	Lumber and Wood Products	21,776.20	17
20	Furniture and Fixtures	23,230.61	15
21	Paper and Allied Products	22,629.41	16
22	Chemicals and Allied Products	118,297.19	2
23	Agricultural Chemicals	2,684.51	28
24	Primary Metal Industries	13,723.60	19
25	Fabricated Metals	25,012.00	13
26	Machinery and Transportation Equipment	91,001.98	6
27	Other Manufacturing	57,997.63	8
28	Mining	8,266.36	23
29	Services and Utilities	94,379.62	5
30	Wholesale and Retail Trade	265,334.13	1
31	Transportation and Communication	82,149.53	7
32	Finance, Insurance, and Real Estate	28,071.98	11
33	TVA	26,400.93	12
34	Construction	99,506.61	4

largest weighted multiplier (110,990,630). It is worth noting that there was a high correlation between weighted multiplier rank and contribution to gross domestic output in the state. This was probably true because of the small range between high and low unit multiplier. All sector unit multipliers were greater than one but less than two.

The manufacturing and service sectors, in general, ranked ahead of primary agriculture and agricultural processing sectors as to weighted multipliers. The opposite was found to be true with unit multipliers. This change in rank was due to the high final demand contributions by the manufacturing and service sectors. Meat and poultry processing ranked first in unit multipliers and ninth in weighted multipliers. Farm dairy products fell from a second place ranking in unit multipliers to a twenty-second place ranking in weighted multipliers. On the other hand, wholesale and retail trade moved from twenty-fifth to first when its multiplier was weighted. Transportation and communication moved from thirty-first place to seventh.

Table II-6 gives an industry comparison of unit and weighted multipliers. Agricultural processing firms generated the largest economic change per dollar of output ($1.54), followed by primary agriculture ($1.32), services ($1.23), and manufacturing and mining ($1.15). Service sectors generated the largest total effect in the economy ($595,083,314), followed by manufacturing and mining ($495,701,099), agricultural processing ($142,461,874), and primary agriculture ($40,691,589).

TABLE II-6

COMPARISON OF INDUSTRY UNIT AND WEIGHTED FINAL DEMAND MULTIPLIERS, TENNESSEE, 1963 (MODEL I)

Industries	Unit Multipliers	Rank of Unit Multiplier	Weighted Multipliers	Rank of Weighted Multiplier
Primary Agriculture	1.3226499	2	40,691,589	4
Agricultural Processing	1.5418152	1	142,461,874	3
Manufacturing and Mining	1.1454930	4	495,701,099	2
Services	1.2271968	3	595,083,314	1

CHAPTER III

EMPIRICAL RESULTS OF THE INTERREGIONAL MODEL

I. THE INTERREGIONAL FLOW TABLES

The Basic Interregional Flow Table

Tables B-1, B-2, B-3, and B-4 (Appendix B) summarize the inter-industry interregional flow of goods and services in the Tennessee economy for the year 1963. Table B-1 is interpreted similarly to Table A-1 in Appendix A with the one exception that in Model II sales are assigned according to geographical areas as well as industry of origin and destination.

Table B-1 is interpreted as follows (reading across row 1-E): the livestock sector in East Tennessee sold goods and services valued at $3,955,940 to the livestock purchasing sector (1-E) in East Tennessee; $66,487,040 to the food and tobacco purchasing sector (3-E) in East Tennessee; and $92,240 to the textile purchasing sector (18-E) in East Tennessee. Row 1-E in Tables B-2, B-3, and B-4 represents flows to purchasing sectors in Middle and West regions and to final demand sectors from the East livestock sector.

The columns in Tables B-1, B-2, B-3, and B-4 represent the input-structure of the purchasing sectors. For example (reading down column 1-E in Table B-1), the East Tennessee livestock sector purchased the following goods and services: $3,955,940 from the livestock producing

sector (1-E) in East Tennessee; $57,051,800 from the crops sector (2-E) in East Tennessee; $23,882,130 from the food and tobacco sector (e-E) in East Tennessee; $10,160 from the textile sector (18-E) in East Tennessee; $149,550 from the other manufacturing sector (27-E) in East Tennessee; $345,780 from the service sector (29-E) in East Tennessee; $199,970 from the wholesale sector (30-E) in East Tennessee; $233,010 from the transportation and communication sector (31-E) in East Tennessee; $3,285,400 from the finance sector (32-E) in East Tennessee; and $47,760 from the TVA sector (33-E) in East Tennessee. The figures remaining in column 1-E are purchases from Middle and West regions.

The distribution pattern of the interregional flow table has some important implications. Table III-1 gives a breakdown of the matrix of Tables B-1, B-2, B-3, and B-4. The large number of entries along the diagonal line of Table III-1 indicates that within each region intermediate sectors are more closely related to other intermediate sectors within their own region than to sectors outside the region. This association is to be expected. The off-diagonal entries imply something even more important. The entries in the cells above the diagonal are larger than the entires in the cells below the diagonal. This indicates that goods and services move more from east to west than from west to east.[1] The dollar value of entires in Table III-1 indicates the same movement in the westward flow of goods. The eastern sectors lead the state in the sale of goods to the intermediate sectors with $856 million, followed

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[1]See Lee, Moore, and Lewis, op. cit.

TABLE III-1

NUMBER AND VALUE OF ENTRIES* IN
INTERREGIONAL FLOW TABLE

Intermediate Producing Sectors	Intermediate Purchasing Sectors		
	East	Middle	West
East			
Number	215	123	108
Value	$856,098,310	$70,439,780	$73,542,000
Middle			
Number	82	143	97
Value	$33,611,600	$487,967,700	$55,173,170
West			
Number	68	81	251
Value	$23,270,670	$24,763,050	$564,110,160

*Number of possible entries per cell = 361.

by the West with $564 million, and the Middle with $488 million. The off-diagonal entries show that the East sold more goods to the Middle and West than the Middle and West sold to the East. Also, the Middle sold more goods and services to the West than the West to the Middle.

There are several possible explanations for the greater flow of goods and services from east to west than from west to east in Tennessee. First, the west has a geographical advantage over the east. Goods can and do move in all directions from West Tennessee because of the Mid-south market and the flexible type transportation system permitted by the flat land. One of the first objectives of this study was to determine the trade area of the Memphis Metropolitan Area. Field research showed that Memphis services an area approximately 150 miles in all directions from the center. This is one explanation for West Tennessee's large export outside the state in most producing sectors.

Second, East Tennessee leads the other two regions in the production of manufactured goods. The market range for manufactured goods is greater than the market range for most primary agricultural goods.[2] The production structure of West Tennessee is related more closely to primary agriculture, agricultural processing, and services. A percentage breakdown of 1963 employment in each of the four major areas will demonstrate the superiority of East Tennessee in manufacturing. Manufacturing employment made up 23 percent of the total employment in

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[2]Tibor Barna, Structural Interdependence and Economic Development (London: MacMillan & Co., Ltd., 1963), pp. 119-150.

Memphis, as compared to 29 percent in Nashville, and 46 percent in Chattanooga and Knoxville.

Third, West Tennessee's production structure seems to be more area specialized than either Middle or East Tennessee. Memphis is the production and trade center for the Delta Region which has an agricultural economic base.

Condensed Interregional Flow Table

Tables III-2, III-3, III-4, and III-5 present an aggregated view of Tables B-1, B-2, B-3, and B-4 (Appendix B). The large matrix is condensed in order to obtain a better understanding of the relationships among primary agriculture, agricultural processing, manufacturing and mining, and services on a regional basis. One of the primary purposes in computing a regional model is to show the contrast of regional specialization as well as regional dependency.

A comparison of intraregional dependence shows that the eastern sectors are more independent than either the middle or western sectors (note flows from east to east in Table III-2, middle to middle in Table III-3, and west to west in Table III-4). The agricultural processing industries in West Tennessee (Table III-4) purchased primary agricultural inputs from all three regions. Its purchases from the primary agriculture industry in East Tennessee ($13,799,440) was composed mostly of livestock and livestock products.

Table III-5 contains the final demand contributions and gross domestic output of each industry by region. Primary agriculture's

TABLE III-2

CONDENSED INTERREGIONAL FLOW TABLE, TENNESSEE (EAST, MIDDLE, AND WEST REGIONS TO EAST REGION), 1963 (MODEL II)

Producing Sectors	Purchasing Sectors: East Region			
	Primary Agriculture	Agricultural Processing	Manufacturing and Mining	Services
	Thousands of dollars			
East Region				
Primary Agriculture	61,007.74	87,098.67	211.48	3,070.62
Agricultural Processing	23,882.13	5,020.62	63.38	420.33
Manufacturing and Mining	4,142.90	8,148.05	62,775.29	80,525.42
Services	4,476.40	7,865.41	169,512.20	337,878.25
Middle Region				
Primary Agriculture	--	--	233.24	--
Agricultural Processing	--	--	--	143.45
Manufacturing and Mining	3,684.28	4.59	11,088.16	5,432.72
Services	108.76	120.66	3,583.47	9,212.27
West Region				
Primary Agriculture	--	--	--	--
Agricultural Processing	--	--	--	1,381.09
Manufacturing and Mining	3,206.29	331.79	5,823.61	6,107.31
Services	10.05	98.04	1,391.27	4,921.22

TABLE III-3

CONDENSED INTERREGIONAL FLOW TABLE, TENNESSEE (EAST, MIDDLE, AND WEST REGIONS TO MIDDLE REGION), 1963 (MODEL II)

Producing Sectors	Purchasing Sectors — Middle Region			
	Primary Agriculture	Agricultural Processing	Manufacturing and Mining	Services
	Thousands of dollars			
East Region				
Primary Agriculture	--	4,205.10	--	--
Agricultural Processing	--	280.22	--	40.03
Manufacturing and Mining	21.97	517.28	23,443.83	7,440.47
Services	2,734.50	4,521.74	16,170.71	11,064.13
Middle Region				
Primary Agriculture	44,765.02	87,183.32	719.80	7,190.30
Agricultural Processing	--	--	--	817.31
Manufacturing and Mining	5,187.08	522.94	46,236.82	31,184.52
Services	40,223.54	5,353.49	48,895.37	169,688.19
West Region				
Primary Agriculture	--	--	--	--
Agricultural Processing	--	--	--	1,381.09
Manufacturing and Mining	2,419.59	986.75	5,664.28	9,136.09
Services	259.56	60.33	2,932.32	1,923.04

TABLE III-4

CONDENSED INTERREGIONAL FLOW TABLE, TENNESSEE (EAST, MIDDLE, AND WEST REGIONS TO WEST REGION), 1963 (MODEL II)

Producing Sectors	Purchasing Sectors — West Region			
	Primary Agriculture	Agricultural Processing	Manufacturing and Mining	Services
	Thousands of dollars			
East Region				
Primary Agriculture	--	13,799.44	--	--
Agricultural Processing	--	280.22	--	40.03
Manufacturing and Mining	29.28	735.61	9,091.93	6,079.56
Services	148.36	180.49	2,442.32	2,597.74
Middle Region				
Primary Agriculture	--	2,582.03	--	--
Agricultural Processing	--	--	--	60.05
Manufacturing and Mining	3,266.80	159.24	7,696.08	5,346.23
Services	360.25	32.68	3,554.11	32,115.70
West Region				
Primary Agriculture	31,340.89	105,338.80	13,815.39	12,073.65
Agricultural Processing	--	--	--	1,781.40
Manufacturing and Mining	88.14	2,517.51	26,630.72	48,651.08
Services	6,348.46	3,941.92	64,936.42	246,645.78

TABLE III-5

CONDENSED INTERREGIONAL FLOW TABLE, TENNESSEE (EAST, MIDDLE, AND WEST REGIONS TO FINAL DEMAND AND GROSS DOMESTIC OUTPUT), 1963 (MODEL II)

Producing Sectors	Purchasing Sector Final Demand	Gross Domestic Output
	--- Thousands of dollars ----	
East Region		
Primary Agriculture	118,123.95	287,517.00
Agricultural Processing	388,569.04	418,596.00
Manufacturing and Mining	2,407,330.11	2,610,293.00
Services	1,839,544.91	2,399,149.00
Middle Region		
Primary Agriculture	81,641.99	224,316.00
Agricultural Processing	309,390.19	310,411.00
Manufacturing and Mining	961,020.32	1,080,841.00
Services	1,206,490.06	1,519,754.00
West Region		
Primary Agriculture	143,422.78	305,992.00
Agricultural Processing	404,008.08	408,555.00
Manufacturing and Mining	955,923,09	1,067,504.00
Services	1,789,396.30	2,122,867.00

largest output came in the west region ($305,992,000). Crops accounted for 80 percent of this total. On the other hand, primary agriculture's eastern output was $287,517,000, of which 70 percent was contributed by livestock. The middle region's primary agriculture contributions to gross domestic output originated from an even mixture of crops and livestock.

It is interesting to note that regional contributions to gross domestic output was relatively even for most industries with a few exceptions. The west was superior in the production of agricultural processed products and primary agriculture. The east was superior in the production of manufactured products and service outputs. Although not shown in Table III-3, the middle region did lead the other regions in the production of mining products.

II. INTERREGIONAL TECHNICAL COEFFICIENTS

Basic Table of Interregional Technical Coefficients

Tables B-5, B-6, B-7, and B-8 (Appendix B) give the interregional technical coefficients for Model II. These coefficients are calculated both for the industry of production and purchase and for the region of origin and destination. The symbols E, M, and W are the regional designations. The interpretation of the coefficients in Table B-5 is as follows. The livestock producing sector in East Tennessee made the following purchases for every dollar of output produced (reading across row 1-E and Tables B-5 through B-8): 2.8 cents from livestock in East Tennessee

(1-E), 15.9 cents from food and tobacco (3-E), .02 cents from textile (18-E), 1.4 cents from food and tobacco in Middle Tennessee (3-M), 3.3 cents from food and tobacco in West Tennessee (3-W). The input-structure by industry and region is determined by reading down the columns through the three regions.

As would be expected the majority of inputs of any one sector is purchased from intermediate sectors within the purchasing sector's respective region. One can observe in Table B-5 (Appendix B) that the matrices with like symbols (i.e., EE, MM, WW) have a greater number of coefficients than the matrices with unlike symbols (i.e., EM, EW, ME, MW, WE, and WM). In terms of dependence, sectors within one region are more dependent on each other than on sectors outside the region. A small amount of interregional dependence does exist because of area or regional specialization in production. The output of the TVA sector (no. 33) flows to all regional purchasing sectors. East Tennessee's output of chemicals and plastics, primary metals, fabricated metals, and other manufactured products are regional specialized products that are purchased by purchasing sectors in all three regions.

Condensed Tables of Interregional Technical Coefficients

Tables III-6, III-7, and III-8 present a summation of Tables B-5, B-6, B-7, and B-8 (Appendix B). These coefficients have similar interpretations. Primary agriculture in the east region required the following purchases for every dollar of output (reading down column 1, Table III-6): 21.2 cents from primary agriculture in the east region, 8.3 cents from

TABLE III-6

CONDENSED MATRIX OF INTERREGIONAL TECHNICAL COEFFICIENTS, TENNESSEE (EAST, MIDDLE, AND WEST REGIONS TO EAST REGION), 1963 (MODEL II)

Producing Sectors	Purchasing Sectors — East Region			
	Primary Agriculture	Agricultural Processing	Manufacturing and Mining	Services
East Region				
Primary Agriculture	.2121883	.2080733	.0000810	.0012799
Agricultural Processing	.0830634	.0119940	.0000243	.0001752
Manufacturing and Mining	.0144092	.0194652	.0240491	.0335642
Services	.0155692	.0187900	.0649399	.1408325
Middle Region				
Primary Agriculture	--	--	.0000894	--
Agricultural Processing	--	--	--	.0000598
Manufacturing and Mining	.0128141	.0000110	.0042479	.0022644
Services	.0003783	.0002882	.0013728	.0038398
West Region				
Primary Agriculture	--	--	--	--
Agricultural Processing	--	--	--	.0005757
Manufacturing and Mining	.0111517	.0007926	.0022310	.0025456
Services	.0000350	.0002342	.0005330	.0020512

TABLE III-7

CONDENSED MATRIX OF INTERREGIONAL TECHNICAL COEFFICIENTS, TENNESSEE (EAST, MIDDLE, AND WEST REGIONS TO MIDDLE REGION), 1963 (MODEL II)

Producing Sectors	Purchasing Sectors — Middle Region			
	Primary Agriculture	Agricultural Processing	Manufacturing and Mining	Services
East Region				
Primary Agriculture	--	.0135469	--	--
Agricultural Processing	--	.0009027	--	.0000263
Manufacturing and Mining	.0000979	.0016664	.0216904	.0048958
Services	.0121904	.0145669	.0149612	.0072802
Middle Region				
Primary Agriculture	.1995623	.2808641	.0006660	.0047312
Agricultural Processing	--	--	--	.0005378
Manufacturing and Mining	.0231240	.0016847	.0427786	.0205195
Services	.1793164	.0172465	.0452383	.1116550
West Region				
Primary Agriculture	--	--	--	--
Agricultural Processing	--	--	--	.0009088
Manufacturing and Mining	.0107865	.0031788	.0052406	.0060116
Services	.0011571	.0001944	.0027130	.0012654

TABLE III-8

CONDENSED MATRIX OF INTERREGIONAL TECHNICAL COEFFICIENTS, TENNESSEE (EAST, MIDDLE, AND WEST REGIONS TO WEST REGION), 1963 (MODEL II)

Producing Sectors	Purchasing Sectors — West Region			
	Primary Agriculture	Agricultural Processing	Manufacturing and Mining	Services
East Region				
Primary Agriculture	--	.0337762	--	--
Agricultural Processing	--	.0006859	--	.0000189
Manufacturing and Mining	.0000957	.0018005	.0085170	.0028638
Services	.0004848	.0004418	.0022879	.0012237
Middle Region				
Primary Agriculture	--	.0063199	--	--
Agricultural Processing	--	--	--	.0000283
Manufacturing and Mining	.0106761	.0003898	.0072094	.0025184
Services	.0011773	.0000800	.0033294	.0151285
West Region				
Primary Agriculture	.1024239	.0375440	.0129418	.0056874
Agricultural Processing	--	--	--	.0008391
Manufacturing and Mining	.0002880	.0061620	.0249467	.0229176
Services	.0207471	.0096484	.0608301	.1161852

agricultural processing in the east region, 1.4 cents from manufacturing and mining in the east region, 1.6 cents from services in the east region, 1.3 cents from manufacturing and mining in the middle region, and 1.1 cents from manufacturing and mining in the west region. Other coefficients are interpreted similarly.

The condensed tables of Interregional Technical Coefficients reveal the direct interregional relationship that existed among Tennessee industry groups in 1963. There were 103 direct relationships out of a possible 144. Agricultural processing industries, service industries, and manufacturing industries in the east region had the largest number of interregional direct relationships.

A comparison of interregional input-structure reveals some interesting facts. The input-structure of manufacturing and mining industries and service industries are similar for all three regions. There are some regional differences in the input-structure of primary agriculture and agricultural processing industries. Primary agricultural producers in the east region purchased 35 cents of Tennessee produced inputs for every dollar of output, as compared to 43 cents for the producers in the middle region, and only 14 cents for the producers in the west region. The single coefficient which accounts for the major difference is that between the primary agricultural producing sector and the primary agriculture purchasing sector. These coefficients for the east, middle, and west regions read respectively: 21, 20, and 10. The difference in these coefficients can be explained by one of two reasons.

First, a large percent of the output of primary agriculture in the west is crop production, with cotton, corn, and soybeans being the largest contributors. On the other hand, livestock (beef and dairy) and tobacco are the largest contributors to primary agriculture's output in the east and middle regions. Livestock requires more of its output of one year to produce its output of next year than crops. Seed expenditures do not amount to a large percent of total crop production. Second, the west producers could be importing a larger proportion of their inputs.

The factor which probably accounts for the difference between the coefficients for east, middle, and west agricultural producers is the fact that crop production requires a higher proportion of final demand inputs, especially labor inputs, than livestock requires. Since final demand inputs are not entered into the basic linear input-structure of the model, technical coefficients for those sectors which require final demand inputs will be smaller.

The difference in the interregional technical coefficients for agricultural processing industries closely paralleled that found in primary agriculture. Agricultural processing firms in the east region purchases 26 cents of Tennessee produced inputs (Table III-6, page 61) for every dollar of output delivered to final demand, as compared to 33 cents for producers in the middle region (Table III-7, page 62), and 10 cents for producers in the west region (Table III-8, page 63). This difference is found in the flow of goods and services from the region's primary agricultural sectors to the agricultural processing sectors. The small technical coefficient between west agricultural producers and west

agricultural processing producers (3.8, Table III-8, page 63) implies a small direct relationship between the two sectors and is indicative of importation from the Mid-South area outside Tennessee.

III. INTERREGIONAL INTERDEPENDENCE COEFFICIENTS

Basic Table of Interregional Interdependence Coefficients

Tables B-9, B-10, B-11, and B-12 (Appendix B) present the interregional interdependence coefficients for Model II. Each coefficient shows the output required from sector i (by region) per dollar of output of sector j (by region) delivered to final demand. Table B-9 is interpreted as follows. The food and tobacco processing industry in East Tennessee generates the following increases in output (reading down column 3-E in Table B-9 and interpreting interdependence coefficients as dollars and cents): 17 cents in east livestock production (row 1-E), 12 cents in crop production (2-E), one dollar and 4 cents in food and tobacco processing (3-E), etc. Producing and purchasing sectors are divided by regions E, M, and W, respectively, for east, middle, and west regions of the state. The coefficients in the M rows under the E columns represent the generating effects of output of east sectors delivered to final demand on the output of sectors in the middle region. There is a total of 57 producing and purchasing sectors (19 for each region).

There is a positive number for each cell in the interdependence coefficient matrix (although some coefficients became zero with eight decimal places), which indicates that there is some direct or indirect

relationship among all sectors on a regional basis. However, many relationships were so small they were insignificant.

There was one noticeable difference between the statewide interdependence coefficient tables (A-7, A-8, and A-9, Appendix A) and the interregional interdependence coefficient tables (B-9, B-10, B-11, and B-12, Appendix B). The interregional coefficients had a considerably smaller indirect relationship than the statewide coefficients, a fact which indicates that the regions are more dependent as a unit than the state. The west region tended to be more area specialized and regional dependent than the other two regions.

Condensed Table of Interregional Interdependence Coefficients

Tables III-9, III-10, and III-11 give the interdependence coefficients for major producing groups by region of production and distribution. Each interdependence coefficient measures the influence of a one dollar change in final demand for the products of industry i on the output of industry j.

The group interregional interdependence coefficients explain the direct and indirect relationships that exists between industry groups on a regional basis. All coefficients were greater than zero, indicating some degree of sector and regional relationship. Also, all interdependence coefficients are greater than their corresponding technical coefficients indicating that all indirect relationships are greater than zero. As would be expected, the cells which contained a large technical coefficient also contain a large interdependence coefficient.

TABLE III-9

CONDENSED TABLE OF INTERREGIONAL INTERDEPENDENCE COEFFICIENTS, TENNESSEE (EAST, MIDDLE, AND WEST REGIONS TO EAST REGION), 1963 (MODEL II)

Producing Sectors	East Region Purchasing Sectors			
	Primary Agriculture	Agricultural Processing	Manufacturing and Mining	Services
East Region				
Primary Agriculture	1.2982160	0.2734468	0.0002500	0.0020309
Agricultural Processing	.1091489	1.0351350	.0000602	.0003794
Manufacturing and Mining	.0228457	.0258312	1.0274660	.0403108
Services	.0280050	.0296335	.0777797	1.1671240
Middle Region				
Primary Agriculture	.0000286	.0000121	.0001343	.0000696
Agricultural Processing	.0000026	.0000022	.0000059	.0000728
Manufacturing and Mining	.0177057	.0039093	.0048206	.0031169
Services	.0017308	.0008488	.0022237	.0053453
West Region				
Primary Agriculture	.0002276	.0000646	.0000458	.0000938
Agricultural Processing	.0000188	.0000184	.0000476	.0006793
Manufacturing and Mining	.0151719	.0041338	.0026013	.0032268
Services	0.0012658	0.0006689	0.0009990	0.0029822

TABLE III-10

CONDENSED TABLE OF INTERREGIONAL INTERDEPENDENCE COEFFICIENTS, TENNESSEE (EAST, MIDDLE, AND WEST REGIONS TO MIDDLE REGION), 1963 (MODEL II)

Producing Sectors	Middle Region Purchasing Sectors			
	Primary Agriculture	Agricultural Processing	Manufacturing and Mining	Services
East Region				
Primary Agriculture	0.0000511	0.0178795	0.0000416	0.0000834
Agricultural Processing	.0000152	.0024237	.0000093	.0000404
Manufacturing and Mining	.0030634	.0036790	.0242906	.0066456
Services	.0208118	.0236126	.0205476	.0106245
Middle Region				
Primary Agriculture	1.2509020	.3514564	.0012018	.0069026
Agricultural Processing	.0001382	1.0000500	.0000302	.0006076
Manufacturing and Mining	.0358683	.0125823	1.0460850	.0244767
Services	.2545385	.0911705	.0537279	1.1284640
West Region				
Primary Agriculture	.0002569	.0001296	.0001144	.0001616
Agricultural Processing	.0003460	.0000977	.0000638	.0010335
Manufacturing and Mining	.0156739	.0080596	.0060885	.0072247
Services	0.0032499	0.0014664	0.0037744	0.0022410

TABLE III-11

CONDENSED TABLE OF INTERREGIONAL INTERDEPENDENCE COEFFICIENTS, TENNESSEE (EAST, MIDDLE, AND WEST REGIONS TO WEST REGION), 1963 (MODEL II)

Producing Sectors	West Region Purchasing Sectors			
	Primary Agriculture	Agricultural Processing	Manufacturing and Mining	Services
East Region				
Primary Agriculture	0.0000030	0.0440387	0.0000109	0.0000535
Agricultural Processing	.0000010	.0043973	.0000034	.0000278
Manufacturing and Mining	.0005154	.0027992	.0095035	.0036061
Services	.0009475	.0018415	.0037516	.0021300
Middle Region				
Primary Agriculture	.0000267	.0079105	.0000430	.0001414
Agricultural Processing	.0000022	.0000016	.0000052	.0000427
Manufacturing and Mining	.0125611	.0018037	.0082545	.0035300
Services	.0025754	.0021045	.0055347	.0195237
West Region				
Primary Agriculture	1.1142860	.0420083	.0152450	.0072641
Agricultural Processing	.0000249	1.0000130	.0000668	.0009688
Manufacturing and Mining	.0004952	.0069979	1.0259130	.0035508
Services	0.0262364	0.0124125	0.0710166	1.1319300

As was true in the statewide model, the large interdependence coefficient of the diagonal coefficients belongs to the primary agriculture-primary agriculture cell for both east and middle regions. The service-service cell contained the largest diagonal coefficient for the west region. A complete comparison of the results of Model I and Model II by sector will follow in Chapter IV.

IV. INTERREGIONAL MULTIPLIERS

The unit and weighted multipliers discussed below are interpreted similarly to the statewide multipliers with the one exception that the interregional multipliers are designated according to region as well as sectors.

Interregional Unit Multipliers

The interregional unit multipliers are presented in Tables III-12, III-13, and III-14. Unit multipliers for the east region sectors are found in Table III-12, middle region sectors in Table III-13, and west region sectors in Table III-14. The total unit multipliers are comprised of the output generated in the three regions. For example, a one dollar increase in the final demand for livestock output in the east region will have the following effects (reading across row 1-E in Table III-12): an increase of output in the east region's economy by $1.75, an increase of output in the middle region's economy by 2 cents, an increase of output in the west region's economy by 3 cents, and an increase of output in the state economy by one dollar and 80 cents.

TABLE III-12

INTERREGIONAL UNIT MULTIPLIERS AND THEIR RANK,
EAST TENNESSEE, 1963 (MODEL II)

Sector No.	Sector Title	Regional Unit Multiplier			Total Unit Multiplier	Rank
		East	Middle	West		
1-E	Livestock	1.75482531	0.02111558	0.02702687	1.80296776	3
2-E	Crops	1.03212925	.01660516	.00033052	1.04906493	52
3-E	Food and tobacco	1.38981423	.00475119	.00554724	1.40011266	12
18-E	Textiles	1.07856126	.01513357	.00147066	1.09516549	40
19-E	Lumber	1.06049505	.00935338	.00313309	1.07298152	45
20-E	Furniture	1.05686436	.00091468	.00075114	1.05853018	49
21-E	Paper	1.32237532	.00908231	.00798052	1.33943815	13
22-E	Chemicals and plastics	1.03371511	.00099481	.00493439	1.03964431	53
24-E	Primary metals	1.14803557	.01417512	.00308519	1.16529588	26
25-E	Fabricated metals	1.10506600	.00185110	.00261135	1.10952845	36
26-E	Mach. & transp. equip.	1.30590142	.01262225	.00871302	1.32723669	14
27-E	Other manufacturing	1.18557606	.00812715	.00234932	1.19605253	22
28-E	Mining	1.05325828	.00059644	.00037774	1.05423246	50
29-E	Services	1.29528900	.01665501	.00340398	1.31534799	15
30-E	Wholesale	1.10659609	.00230393	.00355104	1.11245106	35
31-E	Transp. and commun.	1.05649245	.00433239	.00062079	1.06144563	48
32-E	Finance	1.83071720	.04784105	.00306603	1.88162428	2
33-E	TVA	1.30489300	.00161972	.00051726	1.30703008	16
34-E	Construction	1.49946848	0.03014637	0.05592475	1.58553960	5

TABLE III-13

INTERREGIONAL UNIT MULTIPLIERS AND THEIR RANK,
MIDDLE TENNESSEE, 1963 (MODEL II)

Sector No.	Sector Title	Regional Unit Multiplier			Total Unit Multiplier	Rank
		East	Middle	West		
1-M	Livestock	0.03302300	1.68505887	0.02632589	1.74440776	4
2-M	Crops	.00448040	1.21272172	.00140707	1.21860919	20
3-M	Food and tobacco	.05204370	1.47734254	.01061564	1.54000188	7
18-M	Textiles	.01889435	1.10658614	.00118136	1.12666185	32
19-M	Lumber	.00446701	1.05723165	.01371361	1.07541227	43
20-M	Furniture	.03353383	1.06961728	.00267298	1.10582409	39
21-M	Paper	.01020526	1.05114412	.00089178	1.06224116	47
22-M	Chemicals and plastics	.07724866	1.07530770	.01174485	1.16430121	27
24-M	Primary metals	.27734361	1.14658226	.06253831	1.48646408	8
25-M	Fabricated metals	.03250810	1.07140553	.00501066	1.10892429	37
26-M	Mach. & transp. equip.	.03530072	1.12174119	.01891912	1.17596103	24
27-M	Other manufacturing	.07763476	1.10599211	.00642251	1.19004938	23
28-M	Mining	.01558207	1.12401181	.01042329	1.15001717	29
29-M	Services	.04414341	1.23170424	.00982400	1.28567165	17
30-M	Wholesale	.00593235	1.11894443	.00602630	1.13090308	31
31-M	Transp. and commun.	.00543711	1.03198049	.00120372	1.03862132	54
32-M	Finance	.01528067	1.20803929	.00245711	1.22577707	19
33-M	TVA	.07436449	1.04671254	.00045237	1.12152940	34
34-M	Construction	0.04285922	1.38682872	0.04686338	1.47655132	9

TABLE III-14

INTERREGIONAL UNIT MULTIPLIERS AND THEIR RANK,
WEST TENNESSEE, 1963 (MODEL II)

Sector No.	Sector Title	Regional Unit Multiplier			Total Unit Multiplier	Rank
		East	Middle	West		
1-W	Livestock	0.00361652	0.02245076	1.53093510	1.55700238	6
2-W	Crops	.00133466	.01227042	1.00533356	1.01893864	56
3-W	Food and tobacco	.06355518	.01549444	1.33925418	1.41830380	10
18-W	Textiles	.02644990	.00441661	1.13669081	1.16755732	25
19-W	Lumber	.00108928	.00528318	1.02832684	1.03469930	55
20-W	Furniture	.00446213	.00544642	1.06414056	1.07404911	44
21-W	Paper	.00663168	.00159044	1.05479253	1.06301465	46
22-W	Chemicals and plastics	.00523644	.00548873	1.09529745	1.10602262	38
24-W	Primary metals	.02601946	.01728660	1.11250544	1.15581150	28
25-W	Fabricated metals	.04500842	.00505228	1.08980697	1.13986767	30
26-W	Mach. & transp. equip.	.01493521	.01921819	1.20484365	1.23899705	18
27-W	Other manufacturing	.00519267	.03454707	1.03975210	1.07949185	41
28-W	Mining	.00280756	.02404335	1.09918640	1.12603731	33
29-W	Services	.00786246	.01872692	1.18698453	1.21357391	21
30-W	Wholesale	.00117367	.00739394	1.04453783	1.05310544	51
31-W	Transp. and commun.	.00100953	.00333087	1.00684639	1.01118679	57
32-W	Finance	.02728152	.26795810	1.11110618	1.40634580	11
33-W	TVA	.07317499	.00038794	1.00459523	1.07815816	42
34-W	Construction	0.02455188	0.08591378	2.14753938	2.25800504	1

The largest regional unit multiplier was found in the west construction sector (2.25800504, row 34-W, Table III-14). This was the only unit multiplier above two. The largest share of the west construction multiplier was generated in the west region (2.14753938) as compared to its impact in the middle region (.08591378) and east region (.02455188). The second largest unit multiplier was associated with the east's finance sector (1.88162428, row 32-E, Table III-12).

The highest ranking agricultural sector was the east livestock (1.80296776) which was ranked third. Livestock also had a large unit multiplier in the middle and west regions, ranking fourth and sixth, respectively. The direct relationships which account for the relatively large livestock unit multipliers are not easily seen. Livestock does have a clear relationship with agricultural processing industries, but the livestock sector purchases a relatively small amount of manufacturing, mining, and service input. Also, the livestock inputs flowing into manufacturing and service producing sectors is small. Therefore, the direct relationships surrounding the livestock sector are not significant and are clearly not strong enough to explain the relatively large unit multipliers for all three regions. The generating force of the livestock sector must, therefore, be more indirect. The indirect influence of the livestock sector probably works in a round-about process as follows: livestock purchases a large amount of inputs from crop and from agricultural processing sectors. These two sectors purchase inputs from manufacturing and service. Livestock, in turn, sells its output to the agricultural processing sector.

The significant amount of indirect relationship that exists in the primary agriculture and agricultural processing industries may often lead to underestimating the role of agriculture in the economy if only direct relationships are seen and evaluated.

Interregional Weighted Final Demand Multipliers

The interregional weighted final demand multipliers are presented in Tables III-15, III-16, and III-17. The weighted multipliers for sectors in the east region are found in Table III-15, middle region in Table III-16, and west region in Table III-17. Each multiplier measures the impact of a 10 percent change in final demand for the products of one sector on the output of the total economy. Columns 3, 4, and 5 represent the change that will be generated in each region's economy. For example, a 10 percent increase in the final demand for output of the livestock sector in East Tennessee will have the following effects (reading across row 1-E in Table III-15); an increase of output in the economy of the east region by $9,203.58 thousand; an increase of output in the economy of the middle region by $110.74 thousand; an increase of output in the economy of the west region by $141.75 thousand; and an increase of output in the state economy by $9,456.07 thousand (the total of regional influences).

There are three variables which determine the size of the weighted multiplier: the direct relationship, the indirect relationship, and the size of final demand. It is the size of final demand which carries the largest influence barring any drastic variation in the direct relationship.

TABLE III-15

INTERREGIONAL WEIGHTED FINAL DEMAND MULTIPLIERS AND THEIR RANK, EAST TENNESSEE, 1963 (MODEL II)

Sector No.	Sector Title	Weighted Multiplier by Region			Total Weighted Multiplier	Rank
		East	Middle	West		
		Thousands of dollars				
1-E	Livestock	9,203.58	110.74	141.75	9,456.07	34
2-E	Crops	6,778.68	109.06	2.17	6,889.91	43
3-E	Food and tobacco	54,003.89	184.61	215.54	54,404.04	7
18-E	Textiles	62,725.46	880.12	85.53	63,691.11	5
19-E	Lumber	8,034.12	70.86	23.73	8,128.71	39
20-E	Furniture	14,167.94	12.26	10.07	14,190.27	28
21-E	Paper	11,131.57	76.45	67.18	11,275.20	32
22-E	Chemicals and plastics	83,705.24	80.55	399.56	84,185.35	3
24-E	Primary metals	11,135.00	137.49	29.92	11,302.41	31
25-E	Fabricated metals	13,579.17	22.74	32.09	13,634.00	29
26-E	Mach. & transp. equip.	35,419.51	342.35	236.32	35,998.18	11
27-E	Other manufacturing	19,659.35	134.76	38.96	19,833.07	24
28-E	Mining	6,856.61	3.88	2.46	6,862.95	44
29-E	Services	31,911.20	410.32	83.86	32,405.38	14
30-E	Wholesale	105,164.66	218.95	337.47	105,721.08	1
31-E	Transp. and commun.	24,296.13	99.63	14.28	24,410.04	20
32-E	Finance	7,378.67	192.82	12.36	7,583.85	41
33-E	TVA	20,532.77	25.49	8.14	20,566.40	23
34-E	Construction	32,270.21	648.78	1,203.56	34,122.55	13

TABLE III-16

INTERREGIONAL WEIGHTED FINAL DEMAND MULTIPLIERS AND THEIR RANK, MIDDLE TENNESSEE, 1963 (MODEL II)

Sector No.	Sector Title	Weighted Multiplier by Region			Total Weighted Multiplier	Rank
		East	Middle	West		
		Thousands of dollars				
1-M	Livestock	141.43	7,216.51	112.74	7,470.68	42
2-M	Crops	17.39	4,707.24	5.46	4,730.09	46
3-M	Food and tobacco	1,610.18	45,707.53	328.44	47,646.15	8
18-M	Textiles	376.11	22,027.87	23.52	22,427.50	21
19-M	Lumber	10.83	2,563.75	33.25	2,607.83	52
20-M	Furniture	108.84	3,471.78	8.68	3,589.30	47
21-M	Paper	5.43	559.62	.48	565.53	56
22-M	Chemicals and plastics	1,376.33	19,158.66	209.26	20,744.25	22
24-M	Primary metals	119.28	493.11	26.90	639.29	54
25-M	Fabricated metals	216.58	7,138.09	33.39	7,388.06	40
26-M	Mach. & transp. equip.	837.68	26,618.71	448.95	27,905.34	16
27-M	Other manufacturing	1,619.70	23,074.30	133.99	24,827.99	18
28-M	Mining	7.64	551.41	5.11	564.16	55
29-M	Services	588.32	16,415.52	130.93	17,134.77	26
30-M	Wholesale	361.02	68,093.84	366.73	68,821.59	4
31-M	Transp. and commun.	101.20	19,207.12	22.40	19,330.72	25
32-M	Finance	110.09	8,703.50	17.70	8,831.29	35
33-M	TVA	231.50	3,258.46	1.41	3,491.37	49
34-M	Construction	751.60	24,320.13	821.82	25,893.55	17

TABLE III-17

INTERREGIONAL WEIGHTED FINAL DEMAND MULTIPLIERS AND THEIR RANK, WEST TENNESSEE, 1963 (MODEL II)

Sector No.	Sector Title	Weighted Multiplier by Region			Total Weighted Multiplier	Rank
		East	Middle	West		
		---------- Thousands of dollars ----------				
1-W	Livestock	8.15	50.62	3,251.77	3,510.55	48
2-W	Crops	10.98	100.96	8,271.69	8,383.63	38
3-W	Food and tobacco	2,567.68	625.99	54,106.95	57,300.62	6
18-W	Textiles	553.36	92.40	23,780.62	24,426.38	19
19-W	Lumber	9.17	44.46	8,654.72	8,708.35	36
20-W	Furniture	22.16	27.05	5,285.51	5,334.72	45
21-W	Paper	59.87	14.36	9,522.11	9,596.34	33
22-W	Chemicals and plastics	54.19	56.80	11,335.33	11,446.33	30
24-W	Primary metals	34.91	23.19	1,492.52	1,550.61	53
25-W	Fabricated metals	122.80	13.76	2,968.15	3,104.49	50
26-W	Mach. & transp. equip.	328.10	422.19	26,468.18	27,218.47	15
27-W	Other manufacturing	79.91	531.65	16,000.85	16,612.41	27
28-W	Mining	1.37	11.76	537.73	550.86	57
29-W	Services	224.50	534.73	33,893.28	34,652.51	12
30-W	Wholesale	98.10	618.03	87,309.25	88,025.38	2
31-W	Transp. and commun.	41.05	135.43	40,938.37	41,114.85	9
32-W	Finance	165.27	1,623.29	6,731.10	8,519.66	37
33-W	TVA	187.43	.99	2,573.15	2,761.57	51
34-W	Construction	430.14	1,505.18	37,624.17	39,559.49	10

Following the pattern of Model I, the service and manufacturing sectors rose to the top of the ranks when unit multipliers were weighted. The largest weighted multiplier was the east region's wholesale and retail sector (30-E, Table III-15). A 10 percent increase in the final demand for products and services of the east's wholesale and retail sector will increase output in the Tennessee economy by $105,721,280. As would be expected, its impact was largely in the east region. The wholesale and retail sector in the west region had the second largest weighted multiplier ($88,025,380), and this sector ranked fourth in the middle region ($68,821,590). Chemicals and plastics in the east region had the third largest weighted multiplier ($84,185,350, row 22-E, Table III-15). It will be recalled that these two sectors had the largest statewide weighted multipliers in Model I.

Food and tobacco processing ranked seventh, eighth, and sixth, respectively, in east, middle, and west. The highest ranking primary agricultural sector was the livestock sector in the east region which ranked thirty-fourth ($9,456,070). All three crop sectors registered relatively small weighted final demand multipliers. The west region had the largest crop sector multiplier ($8,383,630), as expected.

Agriculture vs. Industry

Unit multipliers for regional industry groups are presented in Table III-18. Table III-18 was computed in order to show the direct and indirect relationships among primary agriculture, agricultural processing, manufacturing and mining, and services.

TABLE III-18

INDUSTRY UNIT MULTIPLIERS AND RANK, TENNESSEE (EAST, MIDDLE, AND WEST), 1963 (MODEL II)

Industry	Regional Unit Multipliers			Total Unit Multiplier	Rank
	East	Middle	West		
East					
Primary Agriculture	1.4582156	0.0194677	0.0166841	1.4943674	3
Agricultural Processing	1.3640465	.0047724	.0048857	1.3737046	4
Manufacturing and Mining	1.1055559	.0071845	.0036937	1.1164341	12
Services	1.2098451	.0086046	.0069821	1.2254318	5
Middle					
Primary Agriculture	.0239415	1.5414470	.0194267	1.5848152	1
Agricultural Processing	.0475948	1.4552592	.0097533	1.5126073	2
Manufacturing and Mining	.0448891	1.1010449	.0100411	1.1559751	9
Services	.0173939	1.1604509	.0106608	1.1885056	6
West					
Primary Agriculture	.0014669	.0151654	1.1410425	1.1576748	8
Agricultural Processing	.0530767	.0118203	1.0614317	1.1263287	11
Manufacturing and Mining	.0132694	.0138374	1.1122414	1.1393482	10
Services	0.0058174	0.0232378	1.1437137	1.1727689	7

Primary agriculture in the middle region had the largest unit multiplier (1.5848152). A one dollar change in the output of the primary agricultural sector will induce a $1.58 change in the state economy. The change will take place in each region as follows (reading across the fifth row): 2.4 cents in the east region, $1.54 cents in the middle region, and 2 cents in the west region. Agricultural processing, also of the middle region, had the second largest unit multiplier (1.5126073).

The unit multipliers for primary agriculture and agricultural processing sectors in the west region were not as large as those in the middle and east regions. The logical explanation of the small unit multipliers for these two industries in the west can be found in the large amount of final demand inputs purchased by primary agriculture. Because of the significant direct relationship between agriculture and agricultural processing, the input-structure of one sector drastically affects the multiplying forces of the other industry. There is also a strong indication that the agricultural processing producers in the west region import many of their inputs from the Delta region surrounding Memphis where a large percent of the agricultural processing producers are located. Importing is one form of "leakage" which dampens the multiplying effect of new expenditures. This form of leakage affects regional income in the same way that savings or taxation affects the consumption function of consumers. Since both imports and labor are considered exogenous sectors in the model, purchasers of these inputs will tend to have smaller unit multipliers.

Because of the location of the middle region, producers in that region, especially primary agriculture and agricultural processing producers, probably purchase a higher percent of Tennessee produced inputs than the other two regions. The location of major urban areas within the regions is also an important factor affecting sector contributions to the state economy. Memphis in the west region, and Chattanooga and Tri-Cities in the east region are located on the state border.

CHAPTER IV

COMPARISON OF RESULTS IN MODEL I AND MODEL II

This chapter will be concerned with a more detailed analysis of the results obtained in Model I and Model II.

I. PRIMARY AGRICULTURE

Primary agriculture was the smallest contributor of all industry groups to the state's gross domestic output, following services, manufacturing, and agricultural processing. Primary agriculture was the state's second largest user of state produced inputs per dollar of output. The sector had the second largest unit multiplier in the state economy. This can be summarized by saying that by per dollar of output, agriculture is the second most important industry in the state in terms of economic expansion. Given the stable input-structures used in this study, investment in agriculture yielded greater returns to the economy per dollar of investment than either manufacturing or service.

However, the influence of primary agriculture was not evenly distributed over the state. The west region contributed more output ($305,992,000) to the state economy than either east ($287,517,000) or middle ($224,316,000). But because of the diverse nature of agriculture in the state, agriculture in the middle and east regions had a greater return to the economy per dollar of output than the west region; a fact

which over compensated for the west's superior output of agricultural goods. In terms of generating power, primary agriculture in the middle region was superior. A one dollar increase in the output of primary agriculture in the middle region induced a one dollar and 58 cent increase of output in the state economy, compared with one dollar and 49 cents for the east and one dollar and 16 cents in the west. In order to give a more complete analysis of the results obtained it is necessary to turn to the sectors.

Livestock

The results of the two models in this study indicated that livestock is an important segment of the agricultural industry in the state. There are three subdivisions of the livestock industry: meat animals and products, poultry and eggs, and farm dairy products. Model I included all three sectors while Model II included all livestock sector as one industry.

The east region led the state in the production of livestock products with $140,864,000 as compared to $123,343,000 for the middle region, and $72,789,000 for the west. While the input-structure for livestock sectors was similar in all three regions, there was a noticeable difference in the generating power of the different regions. A one-dollar increase in the output of livestock in the east region would generate a one-dollar and 80 cent increase in the state output, compared to a one dollar and 74 cent increase by the middle region, and a one dollar and 74 cent increase by the middle region, and a one dollar and

56 cent increase by the west region. Evidently, the east livestock producing sector is more dependent upon state produced inputs than either middle or west regions. Expansion of the livestock industry in the state would be more beneficial to the state economy if that expansion occurred in East Tennessee.

The weighted multipliers for the livestock sectors showed the same results. A 10 percent increase in the final demand for products of the livestock sector in the east region generated $9,456,070 in the state economy. The same 10 percent change in the middle region generated $7,470,680 and in the west region only $3,510,550.

Meat animals and products. This sector contributed $167,562,000 to the state economy in 1963. A large percent of its output was distributed to the meat and poultry processing industry. The sector purchased 30 cents of state produced inputs for every dollar of output. A one dollar change in output of meat animals induced a one dollar and 36 cent change in the state economy, a unit multiplier which ranked thirteenth in the state. Meat animals had a small weighted final demand multiplier because of the small percent of output which was distributed to final demand sectors. A 10 percent change in the final demand for output of the meat animals sector induced a $2,161,280 change in the state economy. The meat animals sector accounted for some of the importance given to the meat and poultry processing sector in that the meat animals sector sold its output within the state, eliminating the importation of inputs for the meat and poultry processing industry.

Poultry and eggs. Poultry and eggs had a smaller domestic output ($68,901,000) but a large final demand contribution to households which helped the poultry and eggs weighted final demand multiplier ($6,391,480) and a twenty-fifth ranking. The sector had a very large unit multiplier (1.8245219), mainly due to the high percent of state inputs used per dollar of output (65 percent).

The technical coefficients revealed that a one dollar increase in the output of poultry and eggs required 37 cents from its own sector, 9.4 cents from grain mill products, 4.6 cents from services and utilities, .8 cents from agricultural chemicals, and 1.4 cents from wholesale and retail trade. The indirect relationships between poultry and eggs and other agricultural related sectors was significant. For example, the indirect relationship between the poultry and eggs sector and the grain mill products sector induced a 5 cent increase in the output of grain mills per dollar of output in the poultry and eggs. The indirect relationship accounted for more than 25 percent of the total induced investment.

Farm dairy products. The farm dairy products sector generated $1.95 cents in the state economy for every dollar of output delivered to final demand, which was the largest unit multiplier in the state. The sector's 1963 gross domestic output was $100,533,000, the second largest livestock sector. A 10 percent change in the final demand for farm dairy products created $8,705,510 in the state economy. Farm dairy products had a large final demand, which coupled with a relatively large

unit multiplier made the sector the most influential livestock sector in terms of generating output in the state economy.

There were several intersectorial direct and indirect relationships which accounted for the significant multiplying effects of the farm dairy products sector. A one dollar change in farm dairy products delivered to final demand induced the following changes: 9 cents in food and feed grains, 37 cents in forage crops, 27 cents in grain mill products, 2 cents in agricultural chemicals, 1 cent in mining output, 6 cents in services and utilities, 2 cents in wholesale and retail trade, and 4 cents in transportation and communication. It is clear that the linkages between farm dairy products and sectors in all four major producing groups was quite extensive.

Crops and Other Agriculture

The gross domestic output of the crops sector was $475,218,000 in 1963. This figure was adjusted for inshipments and spoilage and deterioration. Although crops had a larger output than livestock, the multiplying effects of the crop sector was less than livestock. The crop sector in the state did not use a large amount of state produced intermediate inputs. Instead, crop sectors purchased a high percent of their inputs from final demand sectors, primarily labor. Because final demand sectors were not entered as productive forces in the models used in this study, the influence of the crop sectors was relatively low.

Crop production in the west region in 1963 was $408,555,000, much larger than the east region ($146,653,000) and middle region

($100,973,000). The crop sectors in the east and west regions had very low unit multipliers. A one dollar change in final demand for crop products of the east region generated only a one dollar and 5 cent change in the state economy. Thus, the generating effect in the economy was only 5 cents for every dollar of output. The west region had even a lower unit multiplier ($1.02). Crop producing in the middle region generated one dollar and 22 cents in the economy for every dollar of output delivered to final demand. These coefficients indicated that crop producing in the middle region of the state is more closely linked to the state economy than crop producing in the east and west regions.

In terms of weighted final demand multipliers, the west's crop producing sector was the largest. A 10 percent change in the final demand for crop products induced a $8,383,630 change in the state economy. The comparative figures for the east and middle regions were $6,889,910 and $4,730,090. The large final demand output of the west sector more than offset the low unit multiplier.

Food and feed grains. Food and feed grains was the second largest crop producing sector with a gross domestic output of $106,984,000 in 1963. Exports accounted for $23,530,000 of the output and $66,949,000 was delivered to grain mill processing. The state produced inputs used by the food and feed grains sector were purchased, largely, from manufacturing and service sectors and from the final demand sectors.

The food and feed grains sector did not have any extensive linkage, either direct or indirect, with other intermediate producing

sectors. Its unit multiplier was only $1.04, which was low enough to be ranked among the lowest unit multipliers. A 10 percent change in the final demand for food and feed grain products induced a change of $3,064,990 in the state economy, mainly due to the exports of the sectors.

Corn and soybeans were the most important food and feed grain products, and West Tennessee was superior in the production of both. A major portion of the corn produced in the east and middle regions was distributed directly to the livestock producing sectors. West Tennessee corn was, in general, distributed to grain processing plants.

Cotton. The results of Model I revealed some important characteristics about the cotton producing sector in the state. Its 1963 gross domestic output of $122,526,000 was the largest output of any crop producing sector. Yet, it delivered only slightly over 20 percent of its output to textile and apparel manufactures, of which 90 percent went out of the state to be made into a semi-raw product. The cotton sector registered a unit multiplier of $1.20 in the state economy. Its weighted multiplier was more significant. A 10 percent increase in the final demand for cotton generated $11,268,810 in the state economy.

Tobacco. The gross domestic output of the tobacco sector in 1963 was $88,385,000, being the third most important crop producing sector. Tobacco manufacturers within the state purchased approximately $40,000,000 from the tobacco sector, and the majority of the remaining output was exported. Thus, the tobacco industry closely paralleled the cotton sector in that both producing sectors exported a large percent

of their output. The tobacco processed by state tobacco manufacturers was used in cigar, chewing and smoking tobacco, and tobacco stemming and redrying. No cigarettes are manufactured in the state.

The tobacco producing sector had a unit multiplier of $1.09 and a weighted multiplier of $5,277,560. The unit multiplier was relatively low because, like most crops, tobacco requires a significant amount of inputs from the final demand sectors, especially household labor. This may be more true of the tobacco sector than other crop sectors because tobacco is still harvested by hand rather than by machine. The east region is the most important tobacco producing region in the state.

Fruits and nuts. Fruits and nuts does not make up a major agricultural sector in the state, having a gross domestic output of only $2,918,000 in 1963. But the sector's unit multiplier of $1.86 was rather significant. This suggests that the state economy would reap relatively high returns from an increase in the output of fruits and nuts. The weighted final demand multiplier for fruits and nuts was extremely low ($307,650) which is a reflection of the sector's relatively small gross domestic output.

Vegetables. The vegetables producing sector produced a gross domestic output of $13,892,000 in 1963. Potatoes, snapbeans, and tomatoes were the largest producing vegetable sectors. Approximately 40 percent of the vegetable output was purchased by agricultural processing; snap beans was the largest contributor.

The vegetable producers in the state purchased very few state produced inputs. Therefore, it only generated $1.09 in the state economy per dollar of output, according to its 1963 input-structure. A 10 percent change in final demand for vegetable products induced a $929,040 change in the state output.

Forage crops. The forage crop sector is composed of hay and pasture. The estimated gross domestic output of the sector in 1963 was $68,402,000; hay contributed $50,562,000 and pasture contributed $17,840,000. Corn and sorghum used for silage are not included in the forage crop sector but are included in the food and feed grains sector.

Hay was contributed to meat animals, farm dairy, miscellaneous agriculture, and grain mill product. All of the pasture output was distributed to livestock purchasing sectors. Forage crops, as expected, had the smallest unit multiplier of all sectors. The expenditure effect induced by a change in the output of forage crops produced less than a one cent change in the economy per dollar of output. The weighted final demand multiplier for the forage crop sector was zero because all of the sector's output was purchased by intermediate producing sectors, none going to the final demand sectors.

Forest products. The forest products sector included sawlogs, fuelwood, pulpwood, and all other forest products. The sector's 1963 gross domestic output was $54,077,000. Sawlogs was the state's most important forest product. The lumber and wood products sector purchased

$37,257,000 of the state produced forest products. Households purchased the majority of the fuelwood output.

The forest products sector had a unit multiplier of $1.01. The one dollar effect was due to the original dollar purchase and the one cent change was caused by the direct relationship between the sawlogs sector and the lumber and wood products sector. A 10 percent change in the final demand for forest products induced a $1,665,610 change in the state's output. The indirect relationships between the forest products sector and other producing sectors was insignificant, less than .001.

Miscellaneous agriculture. The gross domestic output of miscellaneous agriculture in 1963 was $18,034,000. The sector includes honey and beeswax; legumes and grass seeds; greenhouse and nursery products; horses, mules, and goats; and miscellaneous crops. The purchasers of miscellaneous agricultural products included miscellaneous agriculture, dairy products, canned and frozen foods, miscellaneous agricultural processing, chemical and allied products, and households.

Because of extensive direct and indirect linkages between the miscellaneous agricultural sector and other agricultural related sectors, the sector had a unit multiplier of $1.67 in 1963. If we assume that the basic coefficients have remained constant since 1963, a one dollar increase in the output of miscellaneous agriculture will generate a one dollar and 67 cent increase in the state economy. The sector's weighted final demand multiplier was $2,232,520, influenced mainly by the household purchases of greenhouse and nursery products.

II. AGRICULTURAL PROCESSING

The results of both models used in this study revealed some important features of the agricultural processing industry in Tennessee. The sector's state gross output was $1,037,562,000 including output of grain mill products, meat and poultry processing, dairy products, canned and frozen foods, and miscellaneous agricultural processing.

The statewide agricultural processing industry had the largest unit multiplier of all industries. A one dollar increase in the output of agricultural processing industries delivered to final demand generated one dollar and 54 cents in the economy. For every dollar of the output the sector purchased 40 cents of a state produced inputs; a figure which was also high for the state. The amount of instate produced inputs purchased per dollar of output and the unit multiplier are highly correlated. The agricultural processing industry had intensive direct and indirect linkages with primary agricultural sector, manufacturing and mining sector, and service sectors.

The statewide agricultural processing sector registered a weighted final demand multiplier of $142,461,874; ranking third among the four major producing industries. The weighted multiplier of the agricultural processing industry compared favorably with those of manufacturing and services industry when gross output and final demand contributions were evaluated.

Like primary agriculture, the nature of the agricultural processing industry did vary between the regions of the state. In the amount

of output the east region led with $418,596,000 as compared with $310,411,000 for the middle region and $408,555,000 for the west region. The middle region had the largest unit multiplier with $1.54; the west region had a unit multiplier of $1.42 and the east region $1.40. The agricultural processing sector in the east region purchased 26 cents of instate produced inputs per dollar of output, the middle region 33 cents and the west region 10 cents. Some reasons for this difference were given earlier.

The agricultural processing industry unlike other industries, registered significant intersectional and interregional direct and indirect linkages. This is the basic explanation of why the sector posted large statewide technical and interdependence coefficients. The weighted multipliers for each region were large because each sector had large final demands.

Grain Mill Products

The grain mill products sector had a gross domestic output of $279,410,000 in 1963. Prepared animal feeds was the state's largest grain mill sector in output. The sector purchased 36 cents of state produced inputs for every dollar of output. The sector had 19 direct relationships out of a possible 34, and 34 indirect relationship. The grain mill products sector purchased 24 cents of food and feed grains produced in Tennessee per dollar of output.

The grain mill products sector had a state unit multiplier of $1.40 which closely paralleled the state unit multiplier for all

agricultural processing sectors. Its statewide weighted final demand multiplier was $28,521,260, the tenth best weighted multiplier in the state. The east region was the leading producer of grain mill products.

Meat and Poultry Processing

Much has already been said about the results obtained for this sector. It used more instate produced inputs per dollar of output than any other sector (53 percent). It had the largest unit multiplier ($1.97) and the ninth largest weighted final demand multiplier ($54,558,230).

Meat and poultry processing output includes meat slaughtering plants, meat processing plants, and poultry dressing plants. Meat slaughtering plants had, by far, the largest output of any meat and poultry processing sectors.

Model II implied that there was a good deal of interregional shipment of meat and poultry processing output as well as interregional shipment of inputs.

Dairy Products

The dairy products sector sold goods and services valued at $198,628,000 in 1963. This included $25,207,000 output of natural and process cheese, $33,532,000 of condensed and evaporated milk, $30,104,000 of ice cream and frozen dessert, and $101,148,000 of fluid milk. These figures were adjusted for inshipments and inventory depletion. The middle regions had the largest dairy products output.

The statewide unit multiplier for dairy products was $1.23, which was lower than the statewide unit multiplier for the agricultural processing sector as a whole. This figure was also lower than the unit multipliers for state and regional livestock sectors. The sector's weighted final demand multiplier was $16,596,210 which ranked eighteenth in the state. The majority of dairy products were purchased by final demand sectors. Exports were the largest final demand purchasing sector for grain mill products, meat and poultry processing, and dairy products. The exports for the west region were larger, on a percentage basis, than the other two regions; this again points up the location differences of the three regions.

Canned and Frozen Foods

The 1963 gross output of the canned and frozen foods industry in the state was $57,421,000. This sector includes canned fruits and vegetables; canned specialties, pickles, sauces, salad dressing; and, frozen fruits and vegetables. The middle region was the largest producer of canned and frozen foods.

The canned and frozen foods industry had a relatively large unit multiplier of $1.76, seventh ranked sector in the state. The industry purchased 9 cents of state produced vegetables and 12 cents of grain mill products for every dollar of output. The sector purchased approximately 50 cents of instate produced inputs for every dollar of output.

The sector's weighted final demand multiplier was $7,559,570. The comparatively small final demand output offset the weight of the

unit multiplier, reducing the influence of the sector from a seventh ranking according to unit multiplier to a ranking of twenty-fourth in terms of weighted multiplier.

Miscellaneous Agricultural Processing

The miscellaneous agricultural processing sector includes cottonseed oil mills, soybean oil mills, animal and marine fats and oils, roasted coffee, manufactured ice, and food preparation of which soybean oil mills had the largest value of shipments. The sector, itself, had a gross output of $227,436,000 in 1963. Almost one-half of this total output was exported outside the state. The west region was superior in the production of miscellaneous agricultural processed goods, mainly in cottonseed and soybean oils.

The sector had a large number of direct relationships, but the value of each relationship was small. As a result, the sector had a unit multiplier of $1.17, well below the statewide average for agricultural processing sectors. Because of the weight carried by cottonseed and soybean oils, it is expected that many inputs purchased by the sector were imported from the mid-south area outside the state.

The sector had a weighted final demand multiplier of $24,748,930, due to the large percent of its output which was distributed to final demand sectors, especially exports.

III. MANUFACTURING, MINING, AND SERVICES

Manufacturing

Manufacturing industries in the state produced approximately $4.7 million of output in 1963. The results of Model I revealed that manufacturing sectors in the state used less state produced inputs per dollar of output than either agricultural sectors, agricultural processing sectors, or service sectors. The sector contributed approximately 90 percent of its output to final demand, which is a relatively high percent. The manufacturing sectors also imported approximately 90 percent of their inputs. Not only does the manufacturing sector depend on export demand for its output, it is also greatly dependent on foreign on foreign (outside of state) suppliers for inputs.

It seems clear that manufacturing producers in the state have become a part of the pattern which is somewhat characteristic of industrial development in the United States. Industrial location is no longer tied so closely to the location of raw materials.

Manufacturing and mining had a relatively low unit multiplier of $1.15; the lowest among the four major groups. Its weighted final demand multiplier was approximately $500 million, the second highest among the four major groups. Its weighted effect was strengthened by the strong final demands, especially exports.

The manufacturing and mining sector's output in the east region was $2,610,293,000 in 1963, as compared to $1,080,841,000 in the middle region, and $1,067,504,000 in the west region. The sector in the middle

region again purchased more instate produced inputs per dollar of output than the other two regions.

In terms of statewide unit multipliers, the most important manufacturing sectors in the state were agricultural chemicals, paper and allied products, primary metal industries, and machinery and transportation equipment. In terms of total influence, chemicals and allied products, textiles and apparel, machinery and transportation equipment, and other manufacturing were the state's most important manufacturing sectors.

The chemicals and plastics sector in the east region was the single most influential interregional manufacturing sector. It was the only interregional manufacturing sector to rank among the top ten of the interregional weighted final demand multipliers.

Mining

The 1963 output of the state's mineral industry was approximately $160,723,000. The state was a heavy producer of Portland cement, bituminous coal, copper, phosphate rock, sand and gravel, stone and zinc. Tennessee led the nation in the production of ball clay, pyrite, and zinc in 1963. The east region was the greatest producer of minerals in the state with a gross output of $113,760,000, or approximately three-fourths of the state production.

The mining sector had a low statewide unit multiplier of $1.09. Its statewide weighted multiplier was $8,266,360, ranking twenty-third in the state. The sector's unit multiplier in the east region was $1.05, as compared to $1.15 in the middle region, and $1.13 in the west

region. As would be expected from the above figures, the east region had a much larger weighted final demand multiplier because of the large output of minerals in the east region.

The mining industry in the east region purchased fewer state produced inputs per dollar of output than the other two regions. The east region could be importing its inputs for the mining industry or it could be purchasing other final demand inputs, which could account for the difference in the input-structures of the mining industries in the three regions.

Services

The aggregate picture of the service sector's role in the state economy was quite impressive. The service sector purchased, on a statewide average, 18 cents of instate produced intermediate inputs for every dollar of output, a figure which was second only to the manufacturing sectors. The average statewide unit multiplier for service sectors was $1.23. But the statewide service sector had the state's largest weighted multiplier ($595,083,314).

The service sector's output in the middle region was considerably lower than its output in the east and west regions. The east and west regions were superior in the amount of wholesale business. Of course a large share of the east's service output was due to TVA output. For example TVA's east region weighted final demand multiplier was $20,566,400, as compared to $3,491,370 for the middle region and $2,761,570 for the

west region. The west's transportation and communication weighted multiplier was larger than the corresponding multipliers for middle and east regions.

CHAPTER V

SUMMARY AND CONCLUSIONS

I. SUMMARY

The principal objective of this study was to establish quantitative interrelationships among the major producing sectors within the State of Tennessee, with major emphasis upon the agricultural sector.

The Leontief model used in this study involved four major mathematical procedures. First, the flow table was developed to show how and to what extent the products of the major producing sectors in the state were distributed to other intermediate and final demand sectors. Second, technical ciefficients were computed to measure the direct relationships that existed among producing sectors. These coefficients measured the amount of output i required by sector j per unit of output of sector j. Third, interdependence coefficients were computed to show the direct and indirect relationships between producing sectors. These coefficients measured the amount of output in sector i generated by a one dollar final demand delivery by sector j. Fourth, unit multipliers and weighted final demand multipliers were computed for all producing sectors. The unit multipliers measured the impact on the economy of a one dollar change in the output of a particular sector delivered to final demand. The weighted final multipliers measured the impact on the economy of a 10 percent change in the final demand output of a particular sector.

This study made use of two models, both were variations of the Leontief input-output model. Model I was a statewide complete sector analysis. Model II was an interregional condensed sector analysis depicting regional variations. The following are some of the most important results of both models.

Agriculture is a major industry complex in Tennessee. It contributed over $800 million dollars to the 1963 gross domestic output in Tennessee. But agriculture's influence on the state economy is not evenly spread over the state because of the regional nature of agriculture within the state. State agriculture had a unit multiplier of 1.3226499 (a one dollar change in the final demand for agriculture will induce a one dollar and 32 cent change in the state economy). The unit multiplier for livestock in the east region was $1.80, for crops in the east region $1.04, for livestock in the middle region $1.74, crops in the middle region $1.21, for livestock in the west region $1.56, and for crops in the west region $1.02. Livestock output had more effect on the state economy per dollar of output than crops. Because of this, agriculture in the east region had a larger multiplying effect in the state economy than agriculture in either middle or west region. All three livestock sectors--meat animals and products, poultry and eggs, and farm dairy products--had relatively large state unit multipliers. On the other hand, all eight crop sectors had low unit multipliers with the exception of fruits and nuts ($1.86) and miscellaneous agriculture ($1.67).

The agricultural processing industry was the most important single industry grouping in the state in terms of generating power per dollar of output. A one dollar change in the final demand for agricultural processing products induces a $1,54 change in the state economy. The influence of agricultural processing was also not evenly distributed over the state. The industry had a unit multiplier of $1.58 in the middle region, compared to $1.49 in the east region, and $1.16 in the west region. On the state level all agricultural processing sectors had relatively large unit multipliers with the exception of miscellaneous agricultural processing ($1.17). Meat and poultry processing had the largest unit multiplier ($1.97) of any sector in the state, including manufacturing and service sectors. Agricultural processing contributed $1,137 million to the state's 1963 gross domestic output. Its regional output was as follows: $418 million in the east region, $310 million in the middle region, and $409 million in the west region.

Manufacturing and service sectors were the most important producing sectors in the state as to total output. These sectors, in general, had lower unit multipliers than either agriculture or agricultural processing sectors, but they ranked above the agricultural related sectors when their unit multipliers were weighted with final demand contributions. Agricultural chemicals had the largest statewide unit multiplier ($1.94) of the manufacturing sectors while construction in the west region had the largest interregional unit multiplier. Wholesale and retail sectors and chemicals and allied products sectors were largest according to the rank of statewide and interregional final demand multipliers.

The statewide and interregional flow tables revealed that the Tennessee economy is final demand orientated rather than being oriented toward the demands of producing sectors. The technical coefficients also implied that the state imports many of its manufacturing and service inputs.[1] The west region also imported many of its agricultural processing inputs.

The interregional model revealed that the flow of goods and services in the state flowed more readily from east to west than from west to east.

The interdependence coefficients, both state and interregional, revealed that the major producing sectors in the state do not have a close intersectorial or interregional relationship. Although data were not available, it is quite likely that the regions in the state are linked more closely to surrounding regions outside the state boundaries than to separate regions within the state. It is quite certain that the state is not a homogeneous production force. It consists of many branches, of which some do not extend from the same base. Each grows its separate way, independent of the forces around it.

II. CONCLUSIONS

The basic purpose of any input-output interindustry analysis is to establish a base upon which future projections can be made about

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[1] It is logical to assume that inputs were imported if they were not produced within the state.

economic growth for a particular area. It is true that an interindustry analysis only gives a snap-shot of the operations of the economy during some past time period. But, if the basic coefficients remain fairly constant from one time period to the next, the only variable functions are those which fall outside the model, and then the coefficients can be used for prediction of future economic conditions given certain changes in control variables.

The principal objective of this study was to establish the interrelationships between sectors and regions. There are numerous uses for the data provided by this study, many of which this study did not exploit. Besides developing the effects of economic growth and its impact on the Tennessee economic structure, it is possible to develop the impact of alternate projections of final demand on the economic growth of the state and regions.

A subsequent analysis of the data involved in this study could be used to predict optimization of economic growth in the state and regions, assuming a competitive advantage could be established for each producing sector. There is one optimal economic growth for any region given the economic structure of the economy and the competitive position of the region. The various multipliers could be used to show what producing sectors and in what proportion could give the maximum economic growth within its existing competitive structure.

And finally, a subsequent analysis of the input-output structure of the producing forces in the state could be very useful in determining the degree of change in production coefficients. It would be helpful

for economic planners to have some idea of how coefficients are changing from year to year.

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APPENDIXES

APPENDIX A

BASIC INPUT-OUTPUT TABLES OF MODEL I

TABLE A-1

INTERINDUSTRY FLOWS OF GOODS AND SERVICES BY INDUSTRY OF ORIGIN AND DESTINATION, TENNESSEE ECONOMY, SECTORS 1-14, 1963 (MODEL I)

		Purchasing Sectors & Sector Numbers													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Sect. No.	Producing Sectors	Meat animals & prods.	Poultry & eggs	Farm dairy products	Food & feed grains	Cotton	Tobacco	Fruits & nuts	Vege-tables	Forage crops	Forest products	Misc. agri.	Grain mill products	Meat & poultry proc.	Dairy products
		(thousands of dollars)													
1	Meat animals & prod.	--	--	--	--	--	--	--	--	--	--	--	--	140189.00	--
2	Poultry & eggs	--	21862.00	--	--	--	--	--	--	--	--	--	--	11793.00	6.00
3	Farm dairy prod.	--	--	3310.00	--	--	--	--	--	--	--	--	--	--	52570.00
4	Food & feed grains	6254.00	541.00	2309.00	1498.00	--	--	--	--	--	--	40.00	66949.00	--	--
5	Cotton	--	--	--	--	672.00	--	--	--	--	--	--	--	--	--
6	Tobacco	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7	Fruits & nuts	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8	Vegetables	--	--	--	--	--	--	--	113.00	--	--	--	--	--	--
9	Forage crops	23816.00	--	35641.00	--	--	--	--	--	--	--	4056.00	889.00	--	--
10	Forest products	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11	Misc. agr.	--	--	--	--	--	--	--	--	--	--	2257.00	--	--	--
12	Grain mill prod.	10665.40	6482.90	24321.60	--	--	--	--	--	--	--	990.62	21672.30	231.70	140.62
13	Meat & poultry proc.	--	--	--	--	--	--	--	--	--	--	120.40	879.41	1428.62	567.81
14	Dairy products	--	--	--	--	--	--	--	--	--	--	--	672.00	917.40	24371.90
15	Canned & frozen foods	--	--	--	--	--	--	--	--	--	--	--	32.41	106.96	274.00
16	Misc. agr. processing	--	--	--	--	--	--	--	--	--	--	642.00	167.40	99.74	2104.90
17	Tobacco manufactures	--	--	--	--	--	--	--	--	--	--	--	--	--	--
18	Textiles & apparel	7.20	--	4.09	--	4.94	3.50	3.50	4.00	--	--	--	--	--	--
19	Lumber & wood prod.	--	--	--	--	--	--	--	--	--	--	--	216.17	174.53	316.19
20	Furniture & fixtures	--	--	--	--	--	--	--	--	--	--	--	--	--	--
21	Paper & allied prod.	--	--	--	--	--	--	--	--	--	--	--	918.27	1206.24	814.79
22	Chemical & allied prod.	1106.69	550.50	449.50	20.80	21.07	--	--	--	--	--	--	87.51	104.40	72.17
23	Agricultural chemicals	1999.50	44.50	2001.04	672.95	10417.41	3241.17	1072.75	307.90	200.02	--	--	--	--	--
24	Primary metal industries	--	--	--	--	--	--	--	--	--	--	--	--	--	--
25	Fabricated metals	43.80	--	23.17	--	--	--	--	--	--	--	--	1076.24	1142.94	996.19
26	Machinery & transp. equip.	18.01	--	--	70.00	99.07	--	--	--	19.00	--	--	87.30	103.40	62.67
27	Other manufacturing	106.14	37.19	99.90	4.27	49.50	9.50	--	--	30.00	--	10.00	281.90	617.19	116.18
28	Mining	--	--	--	--	--	--	--	--	--	--	--	--	--	--
29	Services & utilities	3210.17	3140.90	4919.24	849.65	1292.60	714.17	196.90	219.66	17.09	107.80	807.30	704.20	618.17	514.90
30	Wholesale & retail trade	1021.40	965.72	1124.70	204.90	417.90	316.41	72.93	107.96	6.70	219.44	298.69	1034.00	2073.62	1949.70
31	Transp. & communication	1873.00	489.73	2432.19	99.40	123.30	77.92	21.16	13.40	1.92	62.33	73.01	3114.19	5234.70	4792.91
32	Finance, ins., & real est.	516.72	249.26	476.91	6.07	89.60	107.18	18.41	6.33	1.00	17.41	83.17	67.18	101.23	48.72
33	TVA	62.20	6.00	60.00	15.41	37.92	19.93	12.86	9.42	12.40	15.40	17.43	307.00	154.90	315.19
34	Construction	98.14	28.05	204.42	--	--	--	--	--	--	--	--	--	--	--

TABLE A-2

INTERINDUSTRY FLOWS OF GOODS AND SERVICES BY INDUSTRY OF ORIGIN AND DESTINATION, TENNESSEE ECONOMY, SECTORS 15-28, 1963 (MODEL I)

Sect. No.	Producing Sectors	Purchasing Sectors & Sector Numbers 15 Canned & frozen foods	16 Misc. agr. proc.	17 Tobacco manu-facturers	18 Textiles & apparel	19 Lumber & wood products	20 Furniture & fixtures	21 Paper & allied products	22 Chemical & allied products	23 Agri-cultural chemicals	24 Primary metal industries	25 Fabri-cated metals	26 Mach. & transp. equip.	27 Other manu-facturing	28 Mining
		(thousands of dollars)													
1	Meat animals & prod.	--	17.00	--	11377.00	--	--	--	--	--	--	--	--	--	--
2	Poultry & eggs	2.00	207.00	--	--	--	--	--	--	--	--	--	--	--	--
3	Farm dairy prod.	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4	Food & feed grains	--	17.00	--	--	--	--	--	--	--	--	--	--	--	--
5	Cotton	--	--	--	23000.00	--	--	--	--	--	--	--	--	782.00	--
6	Tobacco	--	--	40000.00	--	--	--	--	--	--	--	--	--	--	--
7	Fruit & nuts	772.00	587.00	--	--	--	--	--	--	--	--	--	--	--	--
8	Vegetables	4946.00	283.00	--	--	--	--	--	--	--	--	--	--	--	--
9	Forage crops	--	--	--	--	--	--	--	--	--	--	--	--	--	--
10	Forest products	--	--	--	--	19872.00	--	17257.00	400.00	60.00	--	--	--	--	--
11	Misc. agr	887.00	595.00	--	--	--	--	--	887.00	--	--	--	--	--	--
12	Grain mill prod.	6724.50	2347.88	--	--	--	--	--	167.90	1172.84	4.50	21.70	--	--	--
13	Meat & poultry proc.	4272.00	7076.96	--	--	--	--	--	3792.19	672.00	--	--	--	672.94	--
14	Dairy products	814.00	1174.90	--	--	--	--	--	546.70	17.40	--	--	--	274.37	--
15	Canned & frozen foods	4791.72	2016.72	--	--	--	--	--	417.92	6.14	--	--	--	2.91	--
16	Misc. agr. processing	2745.50	4216.15	--	--	--	--	--	107.61	3.72	--	1.00	--	4.11	--
17	Tobacco manufactures	--	--	449.50	--	--	--	--	16.70	1.40	--	--	--	--	--
18	Textiles & apparel	--	--	--	2824.45	11.29	22.59	--	56.48	1.00	84.73	67.78	428.17	432.69	16.94
19	Lumber & wood products	564.11	417.10	123.00	--	1048.79	2326.51	648.45	--	--	155.82	269.69	2200.65	28.77	--
20	Furniture & fixtures	--	--	--	--	--	1299.31	--	--	--	--	--	12.96	--	--
21	Paper & allied prod.	617.19	249.26	319.83	5266.07	577.49	2464.51	4259.23	5221.09	1101.20	195.36	785.72	3971.56	4677.86	1758.22
22	Chemical & allied prod.	67.91	116.90	59.01	13658.60	1182.55	1455.93	1139.85	4000.72	--	215.96	3035.99	6739.47	3541.00	--
23	Agricultural chemicals	--	--	--	--	--	--	--	455.00	--	--	--	--	--	--
24	Primary metal industries	--	--	--	--	142.89	--	82.80	215.44	--	42.50	1019.31	1798.99	311.43	--
25	Fabricated metals	874.40	1292.90	1312.09	25.27	--	150.27	--	720.27	1.26	265.36	564.85	4424.00	198.39	--
26	Machinery & transp. equip.	99.83	106.00	132.71	1751.67	19.28	291.85	10.37	138.77	16.06	222.06	1010.47	9687.25	12661.10	252.22
27	Other manufacturing	216.90	196.40	72.41	2206.70	46.57	363.16	276.13	814.27	117.76	174.03	1175.55	8357.91	19535.71	111.28
28	Mining	--	--	--	2782.82	--	--	--	9080.30	9008.05	--	--	--	16876.86	--
29	Services & utilities	160.80	317.84	244.17	1426.57	1363.82	613.75	1768.78	5726.14	111.50	283.94	4624.76	35017.16	12224.53	3389.94
30	Wholesale & retail trade	517.41	326.82	178.90	5252.17	398.64	615.41	2846.06	6100.10	421.60	3590.48	1924.90	12719.53	3384.06	2185.50
31	Transp. & communication	1234.70	3352.54	678.92	15348.87	4553.36	3837.22	4371.65	13372.62	2274.54	3995.41	4446.47	54436.43	11999.06	2400.67
32	Finance, ins., & real est.	14.90	17.52	--	285.48	332.57	152.93	35.44	2318.28	35.44	--	52.92	6627.12	199.06	343.74
33	TVA	117.80	464.74	201.42	3388.55	334.33	387.12	3006.46	16060.72	1742.04	9152.61	656.09	3378.49	4120.05	236.29
34	Construction	--	--	--	1785.28	--	--	3329.48	522.08	--	471.11	852.69	4715.28	235.56	793.46

TABLE A-3

INTERINDUSTRY FLOWS OF GOODS AND SERVICES BY INDUSTRY OF ORIGIN AND DESTINATION, TENNESSEE ECONOMY, SECTORS 29-41, 1963 (MODEL I)

Sect. No.	Producing Sectors	Purchasing Sectors & Sector Numbers											
		29	30	31	32	33	34	36	37	38	39	40	41
		Services & utilities	Wholesale & retail trade	Transp. & commun.	Finance, ins., & real est.	TVA	Construct.	Business investments	State & local government	Federal government	Households	Exports	Gross domestic output
		(thousands of dollars)											
1	Meat animals & prod.	--	--	--	--	--	--	4740.00	--	--	11201.00	--	167,562.00
2	Poultry & eggs	--	--	--	--	--	--	75.00	--	--	34956.00	--	68,901.00
3	Farm dairy prod.	--	--	--	--	--	--	--	--	--	13888.00	30765.00	100,533.00
4	Food & feed grains	--	--	--	--	--	--	5845.00	--	--	--	23531.00	106,984.00
5	Cotton	--	--	--	--	--	--	5262.00	--	--	--	89000.00	122,526.00
6	Tobacco	--	--	--	--	--	--	--	--	--	2.00	48382.00	88,385.00
7	Fruits & nuts	--	--	--	--	--	--	--	--	--	1559.00	--	2,918.00
8	Vegetables	--	--	--	--	--	--	--	--	--	8550.00	--	13,892.00
9	Forage crops	--	--	--	--	--	--	--	--	--	--	--	68,402.00
10	Forest products	--	--	--	--	--	--	--	--	--	16488.00	--	54,077.00
11	Misc. agr.	--	--	--	--	--	--	--	--	--	13408.00	--	18,034.00
12	Grain mill prod.	799.90	462.19	74.50	--	--	--	2174.14	2007.11	2419.27	81874.51	114554.08	279,410.00
13	Meat & poultry proc.	21675.18	1162.00	174.19	--	--	--	3698.19	862.22	617.72	79637.50	191809.67	319,119.00
14	Dairy products	31274.81	2671.61	816.00	--	--	--	3419.21	1982.50	2697.50	71422.69	55555.01	198,628.00
15	Canned & frozen foods	4114.50	2715.52	101.72	--	--	--	99.71	106.90	274.17	27840.90	14518.80	57,421.00
16	Misc. agr. processing	3718.90	1214.15	161.92	--	--	--	67.16	5992.50	4951.16	91450.10	109787.98	227,436.00
17	Tobacco manufactures	611.42	241.50	10.46	--	--	--	6.74	12.40	213.00	39740.00	14194.88	55,548.00
18	Textiles & apparel	33.88	11.29	33.88	--	--	59.87	10051.31	16.83	58073.98	39657.32	881165.27	993,077.00
19	Lumber & wood prod.	--	--	--	--	--	9834.62	4151.99	179.55	14404.09	802.24	169312.19	207,360.00
20	Furniture & fixtures	114.49	338.06	--	--	4.32	--	3265.87	--	589.93	10658.95	201886.05	218,171.00
21	Paper & allied prod.	--	302.70	--	--	--	51.52	417.55	--	938.15	3106.40	184045.79	223,266.00
22	Chemical & allied prod.	5913.76	594.64	2.20	16.84	26.44	3854.02	4172.19	595.65	106700.51	21296.38	965023.84	1,145,823.00
23	Agricultural chemicals	368.01	--	16.75	--	--	--	2416.00	--	--	1342.00	10067.00	34,622.00
24	Primary metal industries	318.03	--	54.23	--	25.65	366.39	3100.05	175.58	5668.76	3827.34	103026.94	120,177.00
25	Fabricated metals	174.38	27.80	80.87	--	10.11	4742.44	23573.32	--	13391.67	2233.23	187800.16	245,146.00
26	Machinery & transp. equip.	471.89	3776.03	3.94	3.94	5.90	11798.73	26037.20	4754.30	73007.52	27887.01	600791.45	775,397.00
27	Other manufacturing	44842.60	13441.13	3866.70	2518.25	1482.48	51666.77	7195.63	1167.24	7012.19	39230.45	441242.10	648,692.00
28	Mining	618.94	244.70	--	--	22123.44	24227.35	--	1481.37	28616.29	8564.38	37107.50	160,732.00
29	Services & utilities	72021.89	103730.92	9513.51	22969.52	795.29	21022.53	313.20	39063.08	6627.13	393354.44	223126.42	987,125.00
30	Wholesale & retail trade	20496.51	22683.30	1755.89	283.84	24923.01	136858.49	158341.46	9616.73	61417.43	1135557.22	1063870.36	2,686,080.00
31	Transp. & communication	101655.29	26347.48	18196.33	30197.52	5545.26	11071.29	1496.62	1795.69	70581.52	100095.61	612707.04	1,124,444.00
32	Finance, ins., & real est.	988.48	2822.23	1251.14	21422.35	2049.31	3314.05	251.78	4611.46	4612.67	45568.37	118894.58	217,991.00
33	TVA	7041.05	3966.71	2679.67	1754.61	--	193.56	--	860.96	99274.47	44945.80	68987.42	274,000.00
34	Construction	12075.41	995.96	1438.14	17257.66	191.48	123980.23	160545.31	44483.39	54377.07	38496.80	285253.00	752,130.00

TABLE A-4

TECHNICAL COEFFICIENTS, TENNESSEE ECONOMY, SECTORS 1-11, 1963 (MODEL I)

Sect. No.	Producing Sectors	Purchasing Sectors & Sector Numbers: 1 Meat animals & products	2 Poultry and eggs	3 Farm dairy products	4 Food & feed grains	5 Cotton	6 Tobacco	7 Fruits and nuts	8 Vegetables	9 Forage crops	10 Forest products	11 Miscellaneous agriculture
1	Meat animals & prod.	—	—	—	—	—	—	—	—	—	—	—
2	Poultry & eggs	—	.3172958	—	—	—	—	—	—	—	—	—
3	Farm dairy prod.	—	—	.0329245	—	—	—	—	—	—	—	—
4	Food & feed grains	.0373239	.0078518	.0229676	.0140021	—	—	—	—	—	—	—
5	Cotton	—	—	—	—	.0054846	—	—	—	—	—	.0022180
6	Tobacco	—	—	—	—	—	—	—	—	—	—	—
7	Fruits & nuts	—	—	—	—	—	—	—	—	—	—	—
8	Vegetables	—	—	—	—	—	—	—	—	—	—	—
9	Forage crops	.1421342	—	.3545204	—	—	—	—	.0081342	—	—	—
10	Forest products	—	—	—	—	—	—	—	—	—	—	.2249085
11	Misc. agr.	—	—	—	—	—	—	—	—	—	—	—
12	Grain mill prod.	.0636512	.0940901	.2419265	—	—	—	—	—	—	—	.1251525
13	Meat & poultry proc.	—	—	—	—	—	—	—	—	—	—	.0549307
14	Dairy products	—	—	—	—	—	—	—	—	—	—	.0066763
15	Canned & frozen foods	—	—	—	—	—	—	—	—	—	—	—
16	Misc. agr. processing	—	—	—	—	—	—	—	—	—	—	—
17	Tobacco manufactures	—	—	—	—	—	—	—	—	—	—	.0355994
18	Textiles & apparel	.0000430	—	.0000407	—	.0000403	.0000396	.0011995	.0002879	—	—	—
19	Lumber & wood prod.	—	—	—	—	—	—	—	—	—	—	—
20	Furniture & fixtures	—	—	—	—	—	—	—	—	—	—	—
21	Paper & allied prod.	—	—	—	—	—	—	—	—	—	—	—
22	Chemical & allied prod.	.0066047	.0079897	.0044712	.0001944	.0001720	—	—	—	—	—	—
23	Agricultural chemicals	.0119330	.0006459	.0199043	.0062902	.0850220	.0366710	.3676319	.0221638	.0029242	—	—
24	Primary metal industries	—	—	—	—	—	—	—	—	—	—	—
25	Fabricated metals	.0002614	—	.0002305	—	—	—	—	—	—	—	—
26	Machinery & transp. equip.	.0001075	—	—	.0006543	.0008086	—	—	—	.0002778	—	—
27	Other manufacturing	.0006334	.0005398	.0009937	.0000399	.0004040	.0001075	—	—	.0004386	—	.0005545
28	Mining	—	—	—	—	—	—	—	—	—	—	—
29	Services & utilities	.0191583	.0455857	.0489316	.0079418	.0105496	.0080802	.0674777	.0158120	.0002498	.0019935	.0447654
30	Wholesale & retail trade	.0060957	.0140161	.0111874	.0019152	.0034107	.0035799	.0249931	.0077714	.0000980	.0040579	.0165626
31	Transp. & communication	.0111781	.0071077	.0241930	.0009291	.0010063	.0008816	.0072515	.0009646	.0000281	.0011526	.0040485
32	Finance, ins. & real est.	.0030838	.0036177	.0047438	.0000567	.0007313	.0012126	.0063091	.0004557	.0000146	.0003219	.0046118
33	TVA	.0003712	.0000871	.0005968	.0001440	.0003095	.0002255	.0044071	.0006781	.0001813	.0002848	.0009665
34	Construction	.0005857	.0004071	.0020334	—	—	—	—	—	—	—	—

TABLE A-5

TECHNICAL COEFFICIENTS, TENNESSEE ECONOMY, SECTORS 12-23, 1963 (MODEL I)

Sect. No.	Producing Sectors	Purchasing Sectors & Sector Numbers											
		12 Grain mill products	13 Meat & poultry processing	14 Dairy products	15 Canned & frozen foods	16 Misc. agricultural processing	17 Tobacco manufacturers	18 Textiles and apparel	19 Lumber & wood products	20 Furniture and fixtures	21 Paper & allied products	22 Chemical & allied products	23 Agricultural chemicals
1	Meat animals & prod.	—	.4393001	—	—	.0000747	—	.0114563	—	—	—	—	—
2	Poultry & eggs	—	.0369549	.0000302	.0000348	.0009101	—	—	—	—	—	—	—
3	Farm dairy products	—	—	.1647348	—	—	—	—	—	—	—	—	—
4	Food & feed grains	.2396085	—	—	—	.0000747	—	—	—	—	—	—	—
5	Cotton	—	—	—	—	—	—	.0231603	—	—	—	—	—
6	Tobacco	—	—	—	—	—	.7200979	—	—	—	—	—	—
7	Fruits & nuts	—	—	—	.0134446	.0025809	—	—	—	—	—	—	—
8	Vegetables	—	—	—	.0861357	.0012443	—	—	—	—	—	—	—
9	Forage crops	.0031817	—	—	—	—	—	—	—	—	—	—	—
10	Forest products	—	—	—	—	—	—	—	.0958333	—	.0772935	.0003491	.0028850
11	Misc. agr.	—	—	—	.0154473	.0026161	—	—	—	—	—	.0007741	—
12	Grain mill prod.	.0775645	.0007261	.0007080	.1171087	.0103233	—	—	—	—	—	.0001465	.0563947
13	Meat & poultry proc.	.0031474	.0044768	.0028587	.1743979	.0311163	—	—	—	—	—	.0033096	.0323124
14	Dairy products	.0024051	.0028748	.1227012	.0141760	.0051658	—	—	—	—	—	.0004771	.0008367
15	Canned & frozen foods	.0001160	.0003352	.0013795	.0834489	.0088672	—	—	—	—	—	.0003647	.0002952
16	Misc. agr. processing	.0005991	.0003125	.0105972	.0478135	.0185377	—	—	—	—	—	.0000939	.0001789
17	Tobacco manufactures	—	—	—	—	—	.0089922	—	—	—	—	.0000146	.0000673
18	Textiles & apparel	—	—	—	—	—	—	.0028441	.0000544	.0001035	—	.0000493	.0000481
19	Lumber & wood prod.	.0007737	.0005469	.0015919	.0098241	.0018339	.0022143	—	.0050578	.0106637	.0029044	—	—
20	Furniture & fixtures	—	—	—	—	—	—	—	—	.0059555	—	—	—
21	Paper & allied prod.	.0032865	.0037799	.0041021	.0107485	.0010960	.0057577	.0053028	.0027850	.0112962	.0190769	.0045566	.0529499
22	Chemical & allied prod.	.0003132	.0003272	.0003633	.0011827	—	.0038878	.0030572	.0325013	.0162304	—	.0000593	.0056210
23	Agricultural chemicals	—	—	—	—	—	—	—	—	—	—	.0003971	—
24	Primary metal industries	—	—	—	—	—	—	—	.0006891	—	.0003709	.0001880	—
25	Fabricated metals	.0038518	.0035815	.0050154	.0152279	.0056847	.0236208	.0000254	—	.0006888	—	.0006286	.0000606
26	Machinery & transp. equip.	.0003124	.0003240	.0003155	.0017386	.0004661	.0023891	.0017639	.0000930	.0013377	.0000464	.0001211	.0007722
27	Other manufacturing	.0010089	.0019340	.0005849	.0037774	.0008635	.0013036	.0022221	.0002246	.0016646	.0012368	.0007106	.0056684
28	Mining	—	—	—	—	—	—	.0028022	—	—	—	.0079247	.4331418
29	Services & utilities	.0025203	.0019371	.0025923	.0078004	.0013975	.0043957	.0115062	.0065771	.0028132	.0079223	.0049974	.0053614
30	Wholesale & retail trade	.0037007	.0064980	.0098158	.0090108	.0014370	.0032206	.0052888	.0019225	.0028208	.0127474	.0053238	.0202722
31	Transp. & communication	.0111456	.0164036	.0241301	.0215026	.0147406	.0122222	.0154559	.0219587	.0175881	.0195805	.0116708	.1093687
32	Finance, ins. & real est.	.0002404	.0003172	.0002453	.0002595	.0000770	—	.0002875	.0016038	.0007010	.0001587	.0020232	.0017041
33	TVA	.0010987	.0004854	.0015868	.0020515	.0020434	.0036261	.0034122	.0016123	.0017744	.0134658	.0140168	.0837640
34	Construction	—	—	—	—	—	—	.0017977	—	—	.0149126	.0004556	—

TABLE A-6

TECHNICAL COEFFICIENTS, TENNESSEE ECONOMY, SECTORS 24-34, 1963 (MODEL I)

Sect. No.	Producing Sectors	Purchasing Sectors & Sector Numbers 24 Primary metal industries	25 Fabricated metals	26 Machinery & transp. equip.	27 Other manu-facturing	28 Mining	29 Services and utilities	30 Wholesale & retail trade	31 Transp. and commun.	32 Finance, ins., & real est.	33 TVA	34 Construction
1	Meat animals & prod.	—	—	—	—	—	—	—	—	—	—	—
2	Poultry & eggs	—	—	—	—	—	—	—	—	—	—	—
3	Farm dairy prod.	—	—	—	—	—	—	—	—	—	—	—
4	Food & feed grains	—	—	—	—	—	—	—	—	—	—	—
5	Cotton	—	—	—	.0012055	—	—	—	—	—	—	—
6	Tobacco	—	—	—	—	—	—	—	—	—	—	—
7	Fruits & nuts	—	—	—	—	—	—	—	—	—	—	—
8	Vegetables	—	—	—	—	—	—	—	—	—	—	—
9	Forage crops	—	—	—	—	—	—	—	—	—	—	—
10	Forest products	—	—	—	—	—	—	—	—	—	—	—
11	Misc. agr.	—	—	—	—	—	—	—	—	—	—	—
12	Grain mill prod.	.0000374	.0000885	—	—	—	.0008103	.0001721	.0000663	—	—	—
13	Meat & poultry proc.	—	—	—	.0010374	—	.0219579	.0004326	.0001549	—	—	—
14	Dairy products	—	—	—	.0004230	—	.0316827	.0009946	.0007257	—	—	—
15	Canned & frozen foods	—	—	—	.0000045	—	.0041682	.0010110	.0000905	—	—	—
16	Misc. agr. processing	—	.0000041	—	.0000063	—	.0037674	.0004520	.0001440	—	—	—
17	Tobacco manufactures	—	—	—	—	—	.0006194	.0000899	.0000093	—	—	—
18	Textiles & apparel	.0007050	.0002765	.0005522	.0006670	.0001054	.0000343	0000042	.0000301	—	—	.0000796
19	Lumber & wood prod.	.0012966	.0011001	.0028381	.0000444	—	—	—	—	—	—	.0130757
20	Furniture & fixtures	—	—	.0000167	—	—	.0001160	.0001259	—	—	.0000158	—
21	Paper & allied prod.	.0016256	.0032051	.0051220	.0072112	.0109388	—	.0001127	—	—	—	.0000685
22	Chemicel & allied prod.	.0004910	.0857162	.0086915	.0022444	.0070916	.0059909	.0002214	.0000020	.0000773	.0000965	.0051241
23	Agricultural chemicals	—	—	—	—	—	.0003728	—	.0000149	—	—	—
24	Primary metal industries	.0003536	.0041580	.0023201	.0004801	—	.0003222	—	.0000482	—	.0000936	.0004871
25	Fabricated metals	.0022081	.0023041	.0057055	.0003058	—	.0001767	.0000103	.0000719	—	.0000369	.0063053
26	Machinery & transp. equip.	.0018478	.0041219	.0114933	.0195179	.0015692	.0004780	.0014058	.0000035	.0000181	.0000215	.0156871
27	Other manufacturing	.0014481	.0047953	.0107789	.0301155	.0006923	.0454275	.0050040	.0034388	.0115521	.0054105	.0686939
28	Mining	—	—	—	.0260168	—	.0006270	.0000911	—	—	.0807425	.0322117
29	Services & utilities	.0023627	.0188653	.0451603	.0188449	.0210906	.0729613	.0386180	.0084606	.1053691	.0029025	.0279507
30	Wholesale & retail trade	.0298766	.0078521	.0164039	.0052167	.0135972	.0207638	.0084448	.0015616	.0013021	.0909599	.1819612
31	Transp. & communication	.0332460	.0181380	.0702046	.0184973	.0149359	.1029812	.0098089	.0161825	.1385865	.0202382	.0147199
32	Finance, ins., & real est.	—	.0002159	.0085467	.0003069	.0021386	.0010014	.0010507	.0011127	.0982717	.0074792	.0044062
33	TVA	.0761594	.0026763	.0043571	.0063513	.0014701	.0071329	.0014768	.0023831	.0080490	—	.0002573
34	Construction	.0039201	.0034783	.0060811	.0003631	.0049365	.0122329	.0003708	.0012790	.0791668	.0006988	.1648388

TABLE A-7

INTERDEPENDENCE COEFFICIENTS, TENNESSEE ECONOMY, SECTORS 1-11, 1963 (MODEL I)

Sect. No.	Producing Sectors	Purchasing Sectors & Sector Numbers 1 Meat animals & products	2 Poultry and eggs	3 Farm dairy products	4 Food & feed grains	5 Cotton	6 Tobacco	7 Fruits & nuts	8 Vegetables	9 Forage crops	10 Forest products	11 Miscell. agriculture
1	Meat animals & prod.	1.00052410	.00100861	.00130679	.00018700	.00137289	.00063219	.00614681	.00051300	.00005018	.00002919	.00465530
2	Poultry & eggs	.00000090	1.46476550	.00000237	.00000030	.00000184	.00000087	.00000840	.00000078	.00000006	.00000005	.00006162
3	Farm dairy prod.	.00020167	.00038964	1.03455050	.00007109	.00053071	.00024353	.00237652	.00019620	.00001804	.00000990	.00180249
4	Food & feed grains	.05486912	.04811443	.09046527	1.01431660	.00140013	.00060639	.00605141	.00038615	.00004849	.00000426	.01969905
5	Cotton	.00037103	.00037344	.00037460	.00036795	1.00588530	.00036939	.00040494	.00037546	.00036787	.00036743	.00037208
6	Tobacco	.00001163	.00003580	.00002896	.00000465	.00001097	1.00000670	.00005858	.00001002	.00000043	.00000146	.00002767
7	Fruits & nuts	.00000219	.00000660	.00000579	.00000075	.00000161	.00000103	1.00000890	.00000163	.00000005	.00000025	.00011745
8	Vegetables	.00001172	.00003568	.00003029	.00000416	.00000900	.00000574	.00004982	1.00820990	.00000027	.00000140	.00011407
9	Forage crops	.14288804	.00114588	.36820943	.00043689	.00078470	.00056748	.00217764	.00053114	1.00039750	.00039122	.25901947
10	Forest products	.00013007	.00008087	.00027580	.00005141	.00064593	.00027843	.00277079	.00017180	.00002444	1.00000230	.00005574
11	Misc.agr.	.00000887	.00001939	.00001202	.00000120	.00000236	.00000140	.00001218	.00000222	.00000007	.00000034	1.14319450
12	Grain mill prod.	.06991678	.14979830	.27289765	.00043988	.00549676	.00237343	.02371593	.00149025	.00018998	.00001201	.06956691
13	Meat & poultry proc.	.00118392	.00228737	.00296497	.00041733	.00311552	.00142963	.01395133	.00115177	.00010591	.00005814	.01058152
14	Dairy products	.00105719	.00319543	.00296153	.00034056	.00062115	.00041601	.00357301	.00070968	.00001809	.00009323	.00261062
15	Canned & frozen foods	.00013273	.00040429	.00034213	.00004728	.00010237	.00006523	.00056644	.00010329	.00000308	.00001598	.00070963
16	Misc. agr. processing	.00015740	.00045102	.00045950	.00004375	.00008926	.00005763	.00049955	.00009298	.00000265	.00001319	.04180850
17	Tobacco manufactures	.00001601	.00004958	.00004008	.00000632	.00001510	.00000920	.00008121	.00001378	.00000046	.00000189	.00003830
18	Textiles & apparel	.00004799	.00000814	.00005238	.00000185	.00005165	.00004455	.00124893	.00029501	.00000083	.00000029	.00000627
19	Lumber & wood prod.	.00010029	.00018224	.00030501	.00002513	.00005282	.00003450	.00017044	.00003195	.00001986	.00001931	.00018869
20	Furniture & fixtures	.00000379	.00001190	.00000905	.00000149	.00000272	.00000198	.00001563	.00000344	.00000019	.00000092	.00000960
21	Paper & allied prod.	.00105168	.00071456	.00233370	.00039317	.00509604	.00218830	.02190186	.00134639	.00018106	.00000506	.00044488
22	Chemical & allied prod.	.00684074	.01232493	.00519869	.00026728	.00032296	.00008848	.00077877	.00013795	.00000948	.00001729	.00048821
23	Agricultural chemicals	.01275073	.00134132	.02231359	.00642050	.08556706	.03672487	.36787014	.02239961	.00295807	.00003406	.00107312
24	Primary metal industries	.00001500	.00003518	.00003457	.00000544	.00001162	.00000574	.00004996	.00000807	.00000129	.00000111	.00002576
25	Fabricated metals	.00056735	.00065492	.00137597	.00001391	.00005827	.00002655	.00024898	.00002497	.00000366	.00000236	.00059560
26	Machinery & transp. equip.	.00032100	.00029814	.00051004	.00070444	.00101886	.00009509	.00087137	.00008727	.00029709	.00001198	.00029980
27	Other manufacturing	.00220883	.00498264	.00503104	.00055518	.00180542	.00092998	.00725633	.00112065	.00049970	.00015189	.00398246
28	Mining	.00585304	.00104351	.01030017	.00287232	.03777159	.01623358	.16267594	.00998309	.00133116	.00004898	.00081904
29	Services & utilities	.02266689	.07511173	.05866125	.00900778	.01362459	.00986714	.08296066	.01817060	.00037149	.00239593	.05783275
30	Wholesale & retail trade	.00792249	.02376672	.01605366	.00246087	.00703507	.00527210	.04149130	.00927728	.00024475	.00419451	.02140509
31	Transp. & communication	.01698173	.02196755	.03894869	.00282109	.01333322	.00675521	.06329092	.00591378	.00047814	.00154224	.01394501
32	Finance, ins., & real est.	.00358453	.00612639	.00580217	.00011580	.00119730	.00151621	.00868351	.00064501	.00003380	.00037045	.00604586
33	TVA	.00193371	.00131563	.00361840	.00078188	.00778441	.00347520	.03674719	.00277129	.00044343	.00031984	.00199207
34	Construction	.00146804	.00247478	.00411606	.00017889	.00066842	.00044129	.00356100	.00042865	.00002345	.00007530	.00147999

TABLE A-8

INTERDEPENDENCE COEFFICIENTS, TENNESSEE ECONOMY, SECTORS 12-23, 1963 (MODEL I)

Sect. No.	Producing Sectors	Purchasing Sectors & Sector Numbers 12 Grain mill products	13 Meat & poultry processing	14 Dairy products	15 Canned & frozen foods	16 Miscellaneous agricultural processing	17 Tobacco manufacturer	18 Textiles & apparel	19 Lumber & wood products	20 Furniture and fixtures	21 Paper & allied products	22 Chemical & allied products	23 Agricultural chemicals
1	Meat animals & prod.	.00161578	.44178060	.00172702	.03712617	.01450091	.00052424	.01168987	.00009609	.00005723	.00012672	.00156568	.01460956
2	Poultry & eggs	.00000312	.00054529	.00006924	.00087463	.00137783	.00000077	.00000037	.00000019	.00000010	.00000026	.00000224	.00001865
3	Farm dairy prod.	.00062509	.17130359	.00066788	.01439282	.00559188	.00020168	.00007645	.00003559	.00002033	.00004769	.00060545	.00566311
4	Food & feed grains	.26362476	.03941303	.00046549	.03759633	.00456366	.00045007	.00068490	.00001317	.00000814	.00001818	.00021609	.01618702
5	Cotton	.00036919	.00035949	.00036870	.00037444	.00036866	.00037136	.02372595	.00036952	.00037230	.00037149	.00037007	.00038010
6	Tobacco	.00000328	.00001181	.00000305	.00000691	.00000198	.72663989	.00000723	.00000412	.00000227	.00000634	.00001431	.00006188
7	Fruits & nuts	.00000439	.00000830	.00005729	.01481784	.00276473	.00000128	.00000128	.00000072	.00000042	.00000117	.00000646	.00000775
8	Vegetables	.00001701	.00004532	.00017835	.09487585	.00213958	.00000716	.00000715	.00000399	.00000234	.00000659	.00003877	.00004393
9	Forage crops	.00428660	.12414011	.00088657	.01560296	.00520135	.00053569	.00207839	.00041120	.00040037	.00041994	.00102404	.00467254
10	Forest products	.00038464	.00046357	.00056027	.00214612	.00032339	.00089169	.00045906	.09654984	.00194473	.07911649	.00073053	.00750711
11	Misc. agr.	.00000594	.00001451	.00007080	.01944101	.00322465	.00000303	.00001412	.00000608	.00000666	.00000632	.00089646	.00001064
12	Grain mill prod.	1.08451390	.07693128	.00157569	.14734491	.01559175	.00175100	.00098996	.00003572	.00002253	.00005041	.00057887	.06379079
13	Meat & poultry proc.	.00366958	1.00563750	.00392078	.08449302	.03282713	.00118394	.00044878	.00020895	.00011936	.00027999	.00355432	.03324528
14	Dairy products	.00322616	.00438599	1.14018000	.01911386	.00645574	.00053372	.00054582	.00031773	.00016510	.00043411	.00082798	.00216558
15	Canned & frozen foods	.00018527	.00051411	.00187414	1.09172570	.00990862	.00008143	.00008132	.00004531	.00002662	.00007493	.00044368	.00050010
16	Misc. agr. processing	.00073478	.00053948	.01243369	.05427133	1.01959430	.00007296	.00007253	.00004212	.00002332	.00006222	.00019159	.00039726
17	Tobacco manufactures	.00000442	.00001627	.00000410	.00000947	.00000262	1.00908470	.00000991	.00000558	.00000302	.00000867	.00001974	.00008580
18	Textiles & apparel	.00000362	.00003340	.00000419	.00006067	.00000878	.00004272	1.00285960	.00005736	.00010861	.00000611	.00005286	.00010801
19	Lumber & wood prod.	.00089238	.00088366	.00191264	.01116568	.00205139	.00233299	.00007750	1.00511760	.01084503	.00324091	.00005613	.00033633
20	Furniture & fixtures	.00000148	.00000443	.00000216	.00000341	.00000089	.00000279	.00000272	.00000144	1.00599220	.00000392	.00000204	.00000872
21	Paper & allied prod.	.00380257	.00478175	.00487083	.01359104	.00158351	.00764028	.00569800	.00289698	.01168123	1.01954160	.00483138	.05936213
22	Chemical & allied prod.	.00053814	.00432058	.00059111	.00221050	.00082052	.00155408	.01408991	.00582703	.00692009	.00543342	1.00361150	.00070604
23	Agricultural chemicals	.00173864	.00933838	.00009824	.00859982	.00142623	.02669927	.00218061	.00004072	.00003873	.00004269	.00047152	1.00045080
24	Primary metal industries	.00002477	.00003342	.00003243	.00010215	.00003222	.00011783	.00001840	.00069995	.00002303	.00039965	.00019925	.00005642
25	Fabricated metals	.00423222	.00412019	.00586019	.01798043	.00618407	.02393322	.00008054	.00001560	.00071447	.00013417	.00067198	.00051430
26	Machinery & transp. equip.	.00058872	.00063384	.00044843	.00230395	.00058731	.00266442	.00194940	.00012812	.00142420	.00044664	.00020304	.00185133
27	Other manufacturing	.00158083	.00409775	.00116598	.00570334	.00136685	.00258485	.00334552	.00078199	.00208855	.00388592	.00135230	.00890286
28	Mining	.00093654	.00442105	.00025818	.00428811	.00086510	.01219744	.00437724	.00026125	.00031730	.00188889	.00938913	.44068426
29	Services & utilities	.00591513	.02254431	.00437435	.01153212	.00336228	.01303808	.01399226	.00801021	.00385703	.01072085	.00663872	.02120493
30	Wholesale & retail trade	.00512509	.01307869	.01189706	.01466965	.00272353	.00803031	.00700181	.00291367	.00351511	.01848469	.00735991	.03744473
31	Transp. & communication	.01394905	.01348636	.02932467	.03309127	.01764849	.01907822	.01848360	.02393252	.01933664	.02263534	.01382305	.12610128
32	Finance, ins., & real est.	.00037745	.00294743	.00041058	.00104051	.00029753	.00120639	.00054035	.00189911	.00088780	.00050530	.00245118	.00404158
33	TVA	.00155979	.00211341	.00207956	.00401624	.00243439	.00647184	.00409110	.00196685	.00217156	.01406151	.01433134	.08597726
34	Construction	.00024647	.00133022	.00027496	.00075301	.00019681	.00067460	.00260947	.00039829	.00040256	.01848598	.00106381	.00468461

TABLE A-9

INTERDEPENDENCE COEFFICIENTS, TENNESSEE ECONOMY, SECTORS 24-34, 1963 (MODEL I)

Sect. No.	Producing Sectors	Purchasing Sectors & Sector Numbers 24 Primary metal industries	25 Fabricated metals	26 Machinery & transp. equip.	27 Other manufacturing	28 Mining	29 Services and Utilities	30 Wholesale & retail trade	31 Transp. and commun.	32 Finance, ins., & real est.	33 TVA	34 Construction
1	Meat animals & prod.	.00008218	.00025006	.00057086	.00073467	.00025482	.01085251	.00067447	.00018082	.00136450	.00013517	.00061805
2	Poultry & eggs	.00000017	.00000049	.00000114	.00000113	.00000052	.00002188	.00000198	.00000056	.00000278	.00000033	.00000134
3	Farm dairy prod.	.00002728	.00009426	.00021736	.00028031	.00009690	.00420627	.00026005	.00006854	.00052749	.00005093	.00023744
4	Food & feed grains	.00002351	.00005656	.00007572	.00007817	.00003413	.00139005	.00015993	.00004289	.00017916	.00002463	.00009468
5	Cotton	.00038740	.00038192	.00039893	.00163549	.00037292	.00043267	.00037650	.00037318	.00040198	.00037606	.00047927
6	Tobacco	.00000530	.00001081	.00002595	.00001142	.00001223	.00049054	.00008541	.00001152	.00006284	.00001105	.00003776
7	Fruits & nuts	.00000110	.00000190	.00000447	.00000207	.00000210	.00008102	.00001965	.00000257	.00001060	.00000234	.00000750
8	Vegetables	.00000635	.00001053	.00002480	.00001139	.00001171	.00044814	.00011570	.00001341	.00005864	.00001358	.00004300
9	Forage crops	.00040576	.00045607	.00054544	.00058960	.00045496	.00345324	.00057901	.00043464	.00076926	.00042168	.00055996
10	Forest products	.00027419	.00038723	.00072389	.00064240	.00088018	.00010795	.00002404	.00000859	.00016794	.00008133	.00163712
11	Misc. agr.	.00000317	.00001371	.00001410	.00000802	.00000296	.00011071	.00002601	.00000339	.00001513	.00000325	.00001625
12	Grain mill prod.	.00008126	.00018457	.00020158	.00018021	.00009139	.00362317	.00052758	.00013916	.00047372	.00007533	.00027026
13	Meat & poultry proc.	.00016015	.00055335	.00127600	.00164558	.00056885	.02469289	.00152660	.00040238	.00309663	.00029899	.00139387
14	Dairy products	.00027336	.00082916	.00202780	.00138799	.00091954	.03949568	.00273614	.00120360	.00501714	.00050905	.00217022
15	Canned & frozen foods	.00007235	.00011967	.00028174	.00012937	.00013305	.00508988	.00132182	.00015146	.00066607	.00015493	.00049005
16	Misc. agr. processing	.00005072	.00011222	.00026252	.00012690	.00012038	.00487942	.00072714	.00020857	.00063669	.00010000	.00035155
17	Tobacco manufactures	.00000723	.00001488	.00003591	.00001573	.00001685	.00068109	.00011848	.00001586	.00008713	.00001522	.00005230
18	Textiles & apparel	.00071382	.00029037	.00058039	.00070772	.00011056	.00008079	.00001241	.00003431	.00003968	.00001535	.00017903
19	Lumber & wood prod.	.00140375	.00121972	.00306558	.00017020	.00014823	.00038594	.00006174	.00004707	.00145949	.00005716	.01586942
20	Furniture & fixtures	.00000685	.00000403	.00002603	.00000429	.00000502	.00013024	.00013302	.00000159	.00001908	.00002905	.00003464
21	Paper & allied prod.	.00179658	.00343804	.00551915	.00806651	.01120070	.00085887	.00022915	.00005017	.00035112	.00097866	.00146814
22	Chemical & allied prod.	.00196925	.01272859	.00943072	.00605347	.00027842	.00705461	.00055591	.00010003	.00165640	.00024387	.00740166
23	Agricultural chemicals	.00003988	.00005383	.00007498	.00016858	.00004917	.00073513	.00007723	.00005728	.00012467	.00004189	.00008246
24	Primary metal industries	1.00038460	.00419809	.00241537	.00055994	.00002227	.00039861	.00002330	.00005627	.00012844	.00010466	.00073987
25	Fabricated metals	.00227106	1.00239920	.00590740	.00047089	.00007015	.00076342	.00008787	.00010107	.00079450	.00006931	.00777682
26	Machinery & transp. equip.	.00209185	.00442563	1.01318910	.02050827	.00178490	.00191517	.00163165	.00012763	.00239984	.00046705	.02125978
27	Other manufacturing	.00291830	.00653510	.01500640	1.03270050	.00256165	.05269712	.00741256	.00424292	.02792712	.00698012	.08899827
28	Mining	.00645708	.00074580	.00129059	.02763114	1.00048020	.00365878	.00054544	.00040768	.00520125	.08107989	.04126541
29	Services & utilities	.00538355	.02172637	.05301139	.02350408	.02435403	1.08365350	.04271078	.00972754	.13302948	.01035855	.05065605
30	Wholesale & retail trade	.03847032	.00999651	.02642165	.00780373	.01589397	.02787137	1.00998880	.00243512	.02560879	.09367896	.22302661
31	Transp. & communication	.03698477	.02195427	.08060991	.02449801	.01885462	.11762460	.01523013	1.01791690	.17341542	.02531647	.03103082
32	Finance, ins., & real est.	.00080096	.00043498	.00992059	.00076583	.00251401	.00168056	.00129243	.00130584	1.11004910	.00866389	.00661521
33	TVA	.07648435	.00352638	.00562069	.00719258	.00192360	.00873295	.00192933	.00255316	.01062523	1.00053890	.00208672
34	Construction	.00508711	.00470383	.00938756	.00138019	.00676160	.01633254	.00124579	.00183552	.10753224	.00239490	1.19939610

1.70634463

APPENDIX B

BASIC INPUT-OUTPUT TABLES OF MODEL II

TABLE B-1

INTERREGIONAL FLOW TABLE, TENNESSEE ECONOMY, SECTORS 1-E - 33-E, 1963 (MODEL II)

Sect. No.	Producing Sectors	Purchasing Sectors and Numbers: 1-E Livestk.	2-E Crops	3-E Food & tobacco	18-E Textiles	19-E Lumber	20-E Furnit.	21-E Paper	22-E Chem. & plastics	24-E Primary metals	25-E Fabric. metals	26-E Mach. & equip.	27-E Other manufac.	28-E Mining	29-E Services	30-E Wholesl. & retail	31-E Transp. & comm.	32-E Finance	33-E TVA
		(thousands of dollars)																	
1-E	Livestock	3955.94	—	66487.04	92.44	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2-E	Crops	57051.80	—	20611.63	119.04	—	—	—	—	—	—	—	—	—	3070.62	—	—	—	—
3-E	Food & tobacco	23882.13	—	5020.62	—	—	—	—	63.38	—	—	—	—	—	420.33	—	—	—	—
18-E	Textiles	10.16	15.81	—	877.84	10.16	21.46	—	25.98	79.08	63.27	167.20	457.56	15.81	31.63	10.16	31.63	—	—
19-E	Lumber	—	—	—	—	61.13	1005.64	837.83	—	—	563.35	148.63	—	—	—	—	—	—	—
20-E	Furniture	—	—	—	—	—	1046.57	—	—	—	—	—	—	—	152.29	—	—	—	5.40
21-E	Paper	—	—	895.21	1333.16	371.39	759.96	805.04	558.16	126.66	223.26	1618.68	4083.19	1131.36	—	—	—	—	—
22-E	Chemicals & plastics	—	3786.11	42.65	6984.85	160.87	830.49	332.63	2970.12	—	763.10	6427.07	6602.58	17.63	—	—	—	—	8.81
24-E	Primary metals	—	—	—	—	2.93	—	82.80	—	52.76	689.55	158.28	167.80	—	66.68	—	—	—	24.18
25-E	Fabricated metals	—	50.54	5797.58	36.64	—	50.54	—	240.09	—	731.65	1156.23	120.05	—	137.74	—	—	—	3.79
26-E	Mach. & transp. equip.	—	—	830.55	2203.10	4.82	27.31	3.21	12.85	46.59	613.67	2906.02	49.80	176.71	7.87	39.35	—	3.94	145.31
27-E	Other manufacturing	149.55	130.73	582.06	1927.48	—	668.21	365.17	338.28	228.41	2254.64	1760.30	1410.16	156.65	4672.20	5193.44	—	285.22	1512.53
28-E	Mining	—	—	—	2650.88	—	—	—	—	—	—	—	—	—	—	—	—	—	30915.72
29-E	Services	345.78	31.25	1220.19	4959.90	1149.04	33.91	2158.44	5309.65	472.11	2106.58	21751.33	10986.38	994.77	30947.65	51216.13	5036.36	21130.92	—
30-E	Wholesale & retail	199.97	—	—	2110.67	270.93	361.24	1930.06	2293.88	1789.43	807.62	999.85	2293.87	630.87	7191.26	6730.68	901.81	163.85	16934.43
31-E	Transp. & comm.	233.01	320.66	5947.15	6013.42	2118.48	1584.05	1752.93	6671.84	2603.75	2599.48	32245.46	5690.63	998.32	54544.08	14393.31	11276.51	14996.15	4412.26
32-E	Finance, ins. & real est.	3285.40	—	92.25	184.49	86.90	200.03	43.69	1962.40	—	57.29	2241.08	237.90	318.00	2259.05	5070.60	1094.32	6723.73	1752.18
33-E	TVA	47.76	12.57	605.82	1930.57	170.94	198.59	2005.98	2330.26	5919.91	341.87	628.44	1201.57	118.15	2043.69	1498.20	982.88	613.36	—
34-E	Construction	—	—	—	6388.97	—	—	12985.95	708.05	585.45	100.56	2362.46	292.03	221.78	—	2107.62	—	—	298.92
1-M	Livestock	—	—	—	233.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2-M	Crops	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3-M	Food & tobacco	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18-M	Textiles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	143.45	—	—	—
19-M	Lumber	—	—	—	—	—	15.58	—	—	—	—	—	—	—	—	—	—	—	—
20-M	Furniture	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-M	Paper	—	—	—	7256.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-M	Chemicals & plastics	1415.08	2255.61	—	—	—	—	—	85.94	—	—	273.48	—	—	—	37.63	—	—	—
24-M	Primary metals	—	—	—	—	—	—	—	—	—	11.72	144.36	—	—	—	—	—	—	—
25-M	Fabricated metals	—	—	—	—	—	—	—	—	104.88	—	525.67	—	—	5.05	5.05	—	—	—
26-M	Mach. & transp. equip.	9.00	—	—	1.97	—	14.46	—	—	—	38.55	1416.42	131.73	—	13.82	289.25	—	—	19.45
27-M	Other manufacturing	4.59	—	4.59	5.05	10.72	4.59	4.59	—	—	9.18	90.01	943.23	—	428.64	69.93	1227.70	143.42	16.41
28-M	Mining	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29-M	Services	—	—	—	—	—	—	—	—	—	—	—	—	—	2989.64	—	—	—	—
30-M	Wholesale & retail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31-M	Transp. & comm.	96.20	—	—	12.83	2.14	2.14	10.69	12.83	10.69	4.27	6.41	12.83	4.27	42.75	40.62	4.27	—	100.47
32-M	Finance, ins. & real est.	—	—	—	—	588.43	—	—	—	—	—	—	—	—	—	—	—	1862.39	—
33-M	TVA	10.05	2.51	120.66	382.09	32.68	40.22	397.17	462.53	1171.41	67.87	123.17	236.29	2.51	419.80	316.73	193.56	120.66	—
34-M	Construction	—	—	—	—	—	—	—	—	—	—	—	—	—	913.30	—	—	—	—
1-W	Livestock	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2-W	Crops	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3-W	Food and tobacco	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1381.09	—	—	—
18-W	Textiles	—	—	—	53.10	—	—	—	—	—	—	4.52	—	—	—	—	—	—	—
19-W	Lumber	—	—	163.01	—	27.57	46.75	—	—	157.02	—	134.24	—	—	—	—	49.14	—	—
20-W	Furniture	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.16	—	—	—
21-W	Paper	—	—	—	—	—	—	—	3434.87	—	—	—	—	—	—	40.79	—	—	—
22-W	Chemicals & plastics	3206.29	—	168.78	—	85.31	—	—	2.51	—	155.56	170.61	6.61	—	632.27	—	—	—	2.20
24-W	Primary metals	—	—	—	—	9.53	—	—	—	—	13.19	77.68	—	—	—	—	—	—	—
25-W	Fabricated metals	—	—	—	—	—	—	—	34.12	—	—	10.11	—	—	—	—	—	—	—
26-W	Mach. & transp. equip.	—	—	—	—	—	—	—	19.68	—	53.01	985.88	22.49	—	38.09	173.16	—	—	—
27-W	Other manufacturing	—	—	—	9.18	—	—	—	54.27	—	—	130.14	125 66	—	22.53	885.95	—	—	—
28-W	Mining	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29-W	Services	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30-W	Wholesale & retail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31-W	Transp. & comm.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
32-W	Finance, ins. & real est.	—	—	—	—	—	—	—	—	—	—	—	—	8.74	—	6.80	—	—	—
33-W	TVA	7.54	2.51	98.04	314.22	27.65	32.68	32.68	379.57	95.52	55.30	103.06	196.08	2.51	331.82	261.43	160.88	100.55	—
34-W	Construction	—	—	—	—	—	—	—	—	—	—	143.26	—	—	24.80	—	—	—	—

TABLE B-2

INTERREGIONAL FLOW TABLE, TENNESSEE ECONOMY, SECTORS 1-M - 33-M, 1963 (MODEL II)

Sec. No.	Producing Sectors	Purchasing Sectors and Numbers: 1-M Livestk.	2-M Crops	3-M Food & tobacco	18-M Textile	19-M Lumber	20-M Furn.	21-M Paper	22-M Chem. & plastics	24-M Primary metals	25-M Fabric. metals	26-M Mach. & equip.	27-M Other manufac.	28-M Mining	29-M Services	30-M Wholesl. & retail	31-M Transp. & comm.	32-M Finance	33-M TVA
		(thousands of dollars)																	
1-E	Livestock	—	—	4205.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2-E	Crops	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3-E	Food and tobacco	—	—	280.22	—	—	—	—	—	—	—	—	—	—	40.03	—	—	—	—
18-E	Textiles	1.13	2.26	—	260.98	1.13	2.26	—	3.39	10.16	7.91	44.06	151.39	2.26	4.52	1.13	4.52	—	—
19-E	Lumber	—	—	—	—	31.16	75.51	—	—	—	—	166.61	—	—	—	—	—	—	—
20-E	Furniture	—	—	—	—	—	—	—	—	—	—	—	—	—	3.24	—	—	—	1.08
21-E	Paper	—	—	141.69	195.36	—	55.82	—	—	—	—	691.27	1032.61	—	—	—	—	—	—
22-E	Chemicals & plastics	—	—	40.14	1136.48	—	—	79.33	257.58	6.61	454.37	3894.32	13.22	8.81	—	—	—	—	2.20
24-E	Primary metals	—	—	—	—	2.93	—	17.59	—	1.47	329.02	67.42	56.43	—	11.72	—	—	—	4.40
25-E	Fabricated metals	—	—	27.80	—	—	63.18	—	—	—	13.90	2.53	—	—	17.69	—	53.07	—	1.26
26-E	Mach. & transp. equip.	—	—	—	110.19	4.82	36.95	—	—	—	35.34	59.91	8860.59	165.47	9.84	1.97	—	—	27.31
27-E	Other manufacturing	18.58	—	307.65	1013.14	—	582.96	—	—	—	936.50	255.62	2265.27	—	176.69	191.89	—	2.52	299.26
28-E	Mining	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2291.03
29-E	Services	2605.29	—	—	—	—	—	—	—	—	—	—	—	—	3180.48	10.64	—	109.05	—
30-E	Wholesale & retail	82.57	—	4123.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31-E	Transp. & commun.	4.28	2.14	21.38	102.61	—	34.20	34.20	100.47	—	—	2.14	34.20	—	1201.40	2.14	42.75	—	21.38
32-E	Finance, ins. & real est.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.91	—
33-E	TVA	30.16	10.06	377.06	296.62	45.25	65.36	30.16	10640.75	1168.90	120.66	1694.27	1666.62	50.27	2724.92	1073.37	721.45	575.65	—
34-E	Construction	—	—	—	—	—	—	—	—	—	—	84.03	—	—	—	—	—	—	53.72
1-M	Livestock	2224.68	—	76221.41	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2-M	Crops	42540.34	—	10961.91	719.80	—	—	—	—	—	—	—	—	—	7190.30	—	—	—	—
3-M	Food and tobacco	—	—	—	—	—	—	—	—	—	—	—	—	—	—	817.31	—	—	—
18-M	Textiles	—	—	—	66.66	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19-M	Lumber	—	—	237.32	—	237.32	717.97	—	—	—	—	593.31	79.11	—	—	—	—	—	—
20-M	Furniture	—	—	—	—	—	—	—	—	—	—	—	—	—	—	758.88	—	—	—
21-M	Paper	—	—	—	7256.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-M	Chemicals & plastics	692.49	4453.51	—	—	—	—	—	85.94	—	2.51	1088.91	—	—	—	40.14	—	—	—
24-M	Primary metals	—	—	—	—	—	—	—	559.11	—	96.73	287.25	—	—	—	—	139.96	—	—
25-M	Fabricated metals	—	—	—	—	—	—	—	3.79	140.26	7.58	1541.64	—	—	45.49	36.65	—	—	—
26-M	Mach. & transp. equip.	11.25	—	5.90	24.18	—	133.17	5.90	118.15	143.69	4.82	2674.75	571.28	—	16.07	289.25	5.90	—	4.99
27-M	Other manufacturing	17.21	12.62	279.72	65.63	23.34	17.21	4.59	92.11	—	221.08	3332.30	13668.93	—	1535.48	672.82	1984.94	2346.99	3.79
28-M	Mining	—	—	—	—	—	—	—	9224.10	—	—	—	3147.47	—	—	62.37	—	—	—
29-M	Services	1186.28	—	1203.57	1340.55	580.56	857.13	483.42	—	—	3364.00	2588.67	3834.78	2035.42	18489.06	45800.73	1420.34	747.41	1307.96
30-M	Wholesale & retail	21769.89	14512.83	—	7813.11	—	—	—	—	—	—	7813.11	—	—	1834.58	13727.14	—	—	—
31-M	Transp. & commun.	2058.63	421.13	4074.51	2035.12	739.65	299.28	389.07	904.26	273.63	666.97	7373.02	1849.14	305.69	16772.62	3924.87	2430.60	5932.20	235.15
32-M	Finance, ins. & real est.	—	—	—	—	19.42	—	—	—	—	—	—	—	—	.49	901.58	.49	5804.21	—
33-M	TVA	5.03	2.51	75.41	57.82	10.05	12.57	5.03	2104.01	231.27	25.14	336.84	329.30	10.05	540.46	211.16	143.28	113.12	—
34-M	Construction	267.24	—	—	—	—	—	—	—	—	—	—	—	227.29	1214.98	—	969.78	348.51	—
1-W	Livestock	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2-W	Crops	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3-W	Food and tobacco	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1381.09	—	—	—
18-W	Textiles	—	—	—	53.10	—	—	—	—	—	—	4.52	—	—	—	—	—	—	—
19-W	Lumber	—	—	92.29	—	109.07	46.75	—	—	157.02	—	189.38	—	—	—	—	99.48	—	—
20-W	Furniture	—	—	—	—	—	—	—	—	—	—	8.64	—	—	—	2.16	—	—	—
21-W	Paper	—	—	382.13	42.94	—	6.44	6.44	225.41	—	6.44	—	—	—	—	40.79	—	—	—
22-W	Chemicals & plastics	2419.59	—	393.55	—	258.43	—	—	2.51	—	155.56	198.21	119.00	—	1304.69	143.01	—	—	—
24-W	Primary metals	—	—	—	—	9.53	—	—	—	—	53.49	159.74	—	—	—	—	—	—	—
25-W	Fabricated metals	—	—	118.78	—	—	—	—	51.81	—	—	10.11	—	—	—	—	—	—	—
26-W	Mach. & transp. equip.	—	—	—	—	—	—	—	19.68	—	53.01	2607.59	32.49	—	38.09	173.16	—	—	—
27-W	Other manufacturing	—	—	—	—	—	—	—	54.27	—	—	152.22	880.48	—	33.89	940.22	—	—	—
28-W	Mining	—	—	—	—	—	—	—	—	—	—	—	—	—	4.80	—	—	—	—
29-W	Services	252.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30-W	Wholesale & retail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31-W	Transp. & commun.	—	—	—	—	—	—	—	—	—	—	—	—	213.77	—	—	—	—	—
32-W	Finance, ins. & real est.	—	—	—	—	—	—	—	—	—	—	—	—	8.74	11.17	41.75	—	44.67	—
33-W	TVA	5.03	2.51	60.33	47.76	7.54	10.05	5.03	1731.99	191.05	20.11	276.51	268.97	7.54	442.42	191.05	118.15	93.01	—
34-W	Construction	—	—	—	—	—	—	—	—	—	—	143.26	—	—	24.80	—	—	—	—

TABLE B-3

INTERREGIONAL FLOW TABLE, TENNESSEE ECONOMY, SECTORS 1-W - 33-W, 1963 (MODEL II)

Sec. No.	Producing Sectors	Producing Sectors and Numbers: 1-W Livestk.	2-W Crops	3-W Food & tobacco	18-W Textiles	19-W Lumber	20-W Furnit.	21-W Paper	22-W Chem. & plastic	24-W Prim. metals	25-W Fab. metals	26-W Mach. & equip.	27-W Other manufc.	28-W Mining	29-W Services	30-W Wholesl. & retail	31-W Transp. & comm.	32-W Finance	33-W TVA
		(thousands of dollars)																	
1-E	Livestock	—	—	13676.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2-E	Crops	—	—	123.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3-E	Food and tobacco	—	—	280.22	—	—	—	—	—	—	—	—	—	—	40.03	—	—	—	—
18-E	Textiles	2.26	3.39	—	152.52	2.26	4.52	—	5.65	15.81	12.43	21.46	1.13	3.39	6.78	2.26	6.78	—	—
19-E	Lumber	—	—	—	—	31.16	75.51	—	—	—	—	—	—	—	—	—	—	—	—
20-E	Furniture	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.08
21-E	Paper	—	—	94.46	—	—	—	30.05	—	—	—	32.30	328.46	—	—	—	—	—	—
22-E	Chemicals & plastics	—	—	40.14	4524.43	—	—	52.89	245.88	6.61	551.98	2279.78	—	—	—	—	—	—	2.20
24-E	Primary metals	—	—	—	—	3.66	—	17.59	—	1.46	17.59	93.80	2.20	—	—	—	—	—	3.66
25-E	Fabricated metals	5.05	—	18.95	—	—	12.64	—	—	—	13.90	2.53	—	—	8.85	—	—	—	1.26
26-E	Mach. & transp. equip.	—	—	—	—	4.82	27.31	—	—	—	1.61	17.31	—	—	9.84	1.97	—	—	22.49
27-E	Other manufacturing	18.58	—	582.06	127.60	—	7.63	—	—	19.98	34.39	231.93	75.72	—	525.02	137.63	—	2.52	237.68
28-E	Mining	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1820.83
29-E	Services	—	—	—	—	—	—	—	—	—	—	—	—	—	748.07	10.64	—	54.52	—
30-E	Wholesale & retail	50.32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31-E	Transp. & comm.	—	—	17.10	100.47	—	34.20	34.20	100.47	—	—	—	34.20	—	—	—	—	—	21.38
32-E	Finance, ins. & real est.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	572.41	—
33-E	TVA	17.60	80.44	163.39	263.94	27.65	20.11	384.61	113.12	256.40	17.60	160.87	163.39	32.68	394.66	304.17	263.94	100.55	—
34-E	Construction	—	—	—	—	—	—	—	—	—	698.41	—	—	—	—	—	—	—	42.70
1-M	Livestock	—	—	1837.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2-M	Crops	—	—	744.86	—	—	—	—	—	—	—	—	—	—	—	60.05	—	—	—
3-M	Food and tobacco	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18-M	Textiles	—	—	—	198.84	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19-M	Lumber	—	—	148.63	—	296.06	163.01	—	—	—	—	117.46	79.11	—	—	—	—	—	—
20-M	Furniture	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-M	Paper	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-M	Chemicals & plastics	780.30	2471.38	—	—	—	—	—	85.94	—	—	—	—	—	—	37.63	—	—	—
24-M	Primary metals	—	—	—	—	—	—	—	—	—	34.44	22.72	—	—	—	—	—	—	—
25-M	Fabricated metals	—	—	—	—	—	—	—	—	104.88	—	592.65	—	—	5.05	5.05	—	—	—
26-M	Mach. & transp. equip.	9.00	—	1.97	3.93	—	1.97	1.97	—	—	8.03	409.20	131.73	—	13.82	289.25	1.97	—	3.86
27-M	Other manufacturing	6.12	—	8.64	3.79	13.78	6.12	6.12	—	—	6.12	471.09	724.50	—	436.48	53.01	1263.11	242.13	2.52
28-M	Mining	—	—	—	—	—	—	—	—	—	—	—	4212.62	—	—	62.37	—	—	—
29-M	Services	—	—	—	107.72	—	53.86	53.86	—	—	—	107.72	322.50	—	2147.14	4296.27	—	—	—
30-M	Wholesale & retail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31-M	Transp. & comm.	126.12	—	—	173.15	—	6.41	—	429.68	85.51	87.65	1395.93	—	173.15	1023.97	463.89	—	—	—
32-M	Finance, ins. & real est.	75.74	140.80	—	—	45.64	—	—	—	—	—	—	—	—	—	—	—	1289.01	—
33-M	TVA	2.51	15.08	32.68	52.79	5.03	5.03	75.41	22.62	50.27	2.51	32.68	30.16	7.54	77.93	60.33	52.79	20.11	—
34-M	Construction	—	—	—	—	—	—	—	—	—	—	—	—	227.29	668.10	—	—	11287.46	—
1-W	Livestock	1433.13	—	48768.63	40.40	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2-W	Crops	29907.76	—	56570.17	13774.99	—	—	—	—	—	—	—	—	—	12073.65	—	—	—	—
3-W	Food and tobacco	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1781.40	—	—	—
18-W	Textiles	—	—	—	97.16	—	—	—	21.47	—	—	107.33	—	—	—	—	—	—	—
19-W	Lumber	—	—	699.99	—	415.92	628.08	—	—	161.81	—	874.99	—	—	—	—	182.19	—	—
20-W	Furniture	—	—	—	—	—	—	—	—	—	—	8.64	—	—	—	2.16	—	—	—
21-W	Paper	—	—	1648.74	1262.31	—	1427.62	4139.01	483.03	—	519.52	379.98	122.37	—	—	236.15	—	—	—
22-W	Chemicals & plastics	81.53	6.61	168.78	—	516.86	17.63	27.60	105.45	35.26	261.33	419.53	13.22	—	2480.09	426.59	4.41	—	—
24-W	Primary metals	—	—	—	—	9.53	—	—	—	—	397.18	1060.37	—	—	—	—	—	—	—
25-W	Fabricated metals	—	—	—	—	—	—	—	1637.68	—	—	3012.52	—	—	—	—	—	—	—
26-W	Mach. & transp. equip.	—	—	—	—	—	—	—	19.68	—	419.29	1640.42	404.83	—	295.13	3130.62	—	—	—
27-W	Other manufacturing	—	—	—	9.18	—	—	—	983.13	—	—	2542.00	251.31	—	496.33	7466.25	—	—	—
28-W	Mining	—	—	—	—	—	—	—	—	—	—	—	2197.48	—	549.37	—	—	—	—
29-W	Services	5040.35	942.90	142.30	5694.00	45.88	29.92	—	81.79	—	96.42	4695.23	787.31	—	7841.80	15688.25	303.22	599.79	—
30-W	Wholesale & retail	—	—	—	1712.02	—	65.79	—	4280.70	856.66	876.01	13960.66	—	1712.02	10274.71	4649.68	—	—	—
31-W	Transp. & comm.	53.44	74.82	3702.54	4576.87	1162.92	899.98	1269.81	3161.70	566.50	664.83	9267.04	2894.48	320.66	14029.90	4856.91	2229.65	5006.55	141.09
32-W	Finance, ins. & real est.	221.87	—	69.43	53.40	305.86	—	—	—	—	—	2068.82	—	8.74	435.01	482.59	305.86	975.85	—
33-W	TVA	2.51	12.57	27.65	42.73	5.03	2.51	62.84	20.11	42.73	2.51	27.65	27.64	5.03	65.36	50.27	42.73	15.08	—
34-W	Construction	—	—	—	—	—	—	—	—	—	—	2585.62	—	—	5391.65	—	—	—	—

TABLE B-4

INTERREGIONAL FLOW TABLE, TENNESSEE ECONOMY, SECTORS 34-41, 1963 (MODEL II)

Sec. No.	Producing Sectors	Purchasing Sectors and Numbers: 34-E East construction	34-M Middle construc.	34-W West construction	35 Unallo.	36-E Business invest.E	36-M Business invest.M	36-W Business invest.W	37 State governmt.	38 Federal government	39-E East household	39-M Middle household	39-W West household	40 Exports	41 Gross domestic output
		(thousands of dollars)													
1-E	Livestock	—	—	—	—	289.87	—	—	—	—	47,648.13	—	—	4,509.25	140,864.00
2-E	Crops	—	—	—	—	55.76	—	—	—	12,975.25	6,533.57	—	—	46,112.12	146,653.00
3-E	Food and tobacco	—	—	—	—	7,088.91	—	—	64.72	7,619.66	98,139.91	3,984.80	27,170.72	244,500.32	418,596.00
18-E	Textiles	58.75	6.78	10.16	0.74	3,137.28	52.08	113.88	21.12	46,075.38	15,786.31	5,648.55	4,678.65	506,052.83	584,198.00
19-E	Lumber	3,610.22	1,073.96	1,998.09	—	1,879.18	295.58	480.88	—	156.42	91.70	66.05	203.76	72,584.63	85,437.00
20-E	Furniture	—	—	—	—	1,245.41	—	—	—	473.60	1,277.38	1,484.10	1,249.62	128,328.23	135,266.00
21-E	Paper	—	—	—	1.45	84.58	—	—	—	188.06	125.37	104.55	—	83,676.00	98,688.00
22-E	Chemicals & plastics	2,398.38	1,296.06	42.65	2.53	1,746.43	—	—	556.20	299,481.30	4,595.27	1,396.76	593.38	501,382.16	856,015.00
24-E	Primary metals	117.98	102.59	130.44	.32	2,036.49	1,373.09	1,008.68	243.14	4,555.81	5,373.66	58.54	28.50	82,313.84	99,219.80
25-E	Fabricated metals	832.74	84.66	36.64	1.43	11,895.14	16.05	5.05	—	7,547.84	787.63	195.23	259.42	102,174.71	132,404.00
26-E	Mach. & transp. equip.	702.22	386.30	363.34	1.57	6,631.70	251.89	536.56	374.56	44,253.18	2,581.57	1,818.22	2,085.04	212,693.81	289,149.00
27-E	Other manufacturing	18,574.69	1,384.78	707.39	3.16	1,324.06	235.12	323.38	307.91	198.60	16,361.78	1,338.55	1,318.16	144,413.53	216,157.00
28-E	Mining	10,982.55	—	—	—	—	—	—	2,510.30	27,109.73	2,491.11	—	—	32,987.85	113,760.00
29-E	Services	1,793.38	—	—	—	—	—	—	10,786.83	2,549.70	126,886.89	7,765.61	4,618.91	93,755.60	414,726.00
30-E	Wholesale & retail	29,179.19	442.52	—	—	68,769.83	145.92	—	2,037.78	20,611.47	445,257.75	11,227.87	5,895.18	396,397.88	1,029,832.00
31-E	Transp. & comm.	4,632.45	—	—	—	83.80	10.05	—	59.64	31,623.17	36,072.21	318.09	12.18	161,790.61	404,949.00
32-E	Finance, ins. & real est.	1,959.01	—	47.58	3.99	308.05	—	—	1,064.17	7,905.01	24,890.74	27.58	241.93	5,867.31	68,500.00
33-E	TVA	62.84	62.84	15.08	6.86	—	—	—	432.71	72,971.98	17,609.15	11,761.39	3,667.33	50,709.61	202,207.00
34-E	Construction	35,931.43	838.91	22.04	.99	46,078.71	2,004.03	—	67,517.58	32,301.09	15,484.78	—	—	51,824.79	278,935.00
1-M	Livestock	—	—	—	—	—	4,128.95	—	—	—	—	34,817.82	—	3,879.73	123,343.00
2-M	Crops	—	—	—	.30	—	32.93	—	—	8,090.67	—	3,225.99	—	27,465.90	100,973.00
3-M	Food and tobacco	—	—	—	—	—	1,231.97	—	12,078.51	1,111.54	5,519.01	54,360.78	3,574.48	231,513.90	310,411.00
18-M	Textiles	—	—	—	—	15.14	371.47	15.14	—	375.99	967.54	1,614.91	1,926.16	193,775.15	199,327.00
19-M	Lumber	797.08	2,168.29	975.67	.47	—	304.09	—	—	—	—	—	—	23,945.52	30,876.00
20-M	Furniture	—	—	—	—	303.50	981.45	322.61	—	6.59	384.29	1,225.98	442.07	28,791.63	33,212.00
21-M	Paper	—	—	—	—	—	—	—	—	—	—	—	—	5,323.94	19,836.00
22-M	Chemicals & plastics	—	429.04	95.34	2.04	—	371.08	—	—	141.76	1,734.23	1,560.49	1,143.36	173,218.17	192,502.00
24-M	Primary metals	—	126.04	—	—	—	317.73	—	14.00	—	—	—	—	3,968.94	5,723.00
25-M	Fabricated metals	571.16	2,503.87	645.72	.52	64.07	1,914.67	40.06	—	1,984.92	987.03	805.70	563.08	60,264.11	73,468.00
26-M	Mach. & transp. equip.	910.22	4,050.54	1,047.50	6.93	374.40	2,644.87	391.04	1,610.98	4,209.11	1,457.98	2,815.64	3,007.16	220,786.98	250,134.00
27-M	Other manufacturing	648.42	10,403.73	165.75	1.26	1.26	5,131.64	1.26	847.47	30.91	962.24	16,990.10	1,416.36	183,248.66	250,334.00
28-M	Mining	249.49	3,564.89	—	—	—	—	—	607.18	74.85	—	180.16	3,900.27	143.23	25,429.00
29-M	Services	—	8,474.84	107.72	—	—	596.73	—	10,096.27	1,936.01	84,480.73	626.85	34,911.41	237,156.00
30-M	Wholesale & retail	—	267.06	—	1.03	551.79	62,547.09	275.96	—	28,440.84	6,815.05	261,383.71	4,886.16	243,633.65	676,293.00
31-M	Transp. & comm.	177.43	1,985.95	10,526.18	10.99	422.84	2,065.69	3,921.45	829.65	4,997.80	3,622.16	12,996.11	34,396.06	122,867.28	253,834.00
32-M	Finance, ins. & real est.	—	221.39	—	.92	—	—	—	1,290.67	565.27	1,439.57	10,007.66	1,818.65	56,924.67	82,997.00
33-M	TVA	12.57	12.57	2.51	2.51	—	—	—	125.18	14,436.78	3,483.82	2,326.99	725.47	10,032.17	40,019.00
34-M	Construction	2,018.08	35,855.66	92.29	—	17,897.39	33,699.14	450.18	9,310.98	7,959.35	—	18,189.70	—	87,858.28	229,455.00
1-W	Livestock	—	—	—	—	—	—	2,571.43	—	—	—	—	17,672.79	2,302.62	72,789.00
2-W	Crops	—	—	—	.49	—	—	16.92	—	38,597.81	—	—	9,238.67	73,022.54	233,203.00
3-W	Food and tobacco	—	—	—	3.34	—	—	15,112.56	—	13,583.03	6,318.64	6,444.74	89,438.42	273,110.69	408,555.00
18-W	Textiles	—	—	—	1.57	17.17	16.95	5,783.92	—	267.42	2,313.57	2,315.96	11,608.17	186,886.09	209,552.00
19-W	Lumber	776.70	777.90	1,094.34	.26	—	—	1,307.93	320.87	7,420.40	106.56	35.48	255.19	74,716.67	91,047.00
20-W	Furniture	—	—	—	—	184.04	166.76	973.66	—	1.40	1,333.75	1,576.76	4,227.28	41,205.67	49,693.00
21-W	Paper	—	—	62.26	—	—	—	325.02	—	951.24	189.56	191.49	1,991.79	86,625.66	104,742.00
22-W	Chemicals & plastics	—	138.00	481.93	2.67	12.80	13.05	1,039.46	37.46	3,231.77	697.00	891.58	2,306.05	95,261.71	118,103.00
24-W	Primary metals	.73	.73	27.11	.39	—	—	265.13	—	556.56	.07	1.10	3.59	12,589.35	15,235.00
25-W	Fabricated metals	116.78	—	7,043.54	1.02	—	27.42	15,508.26	—	167.31	40.18	40.31	11,415.87	39,274.00	
26-W	Mach. & transp. equip.	1,462.29	1,574.98	3,270.20	8.72	789.51	1,431.67	16,127.67	4,483.31	21,312.00	1,994.79	2,947.06	17,585.33	153,010.17	236,114.00
27-W	Other manufacturing	1,902.52	3,823.41	7,545.86	1.19	266.98	21.77	863.82	6.05	6,510.87	2,218.82	2,280.28	21,191.32	120,531.10	182,201.00
28-W	Mining	—	40.78	13,856.61	1.93	—	—	—	—	—	—	—	—	4,892.03	21,543.00
29-W	Services	—	—	7,460.78	.01	—	—	3.59	3,838.38	340.06	—	95.68	234,547.54	46,715.78	335,243.00
30-W	Wholesale & retail	55.47	55.47	105,590.58	.40	—	3,380.70	39,270.19	6,664.50	15,237.38	7,980.05	9,966.23	341,061.55	412,304.23	979,955.00
31-W	Transp. & comm.	2.14	2.14	3,963.34	—	—	72.47	842.05	2,057.77	45,427.12	170.80	213.78	7,313.80	350,502.13	465,661.00
32-W	Finance, ins. & real est.	—	158.27	710.29	—	—	—	—	6,406.16	2,053.08	3,255.61	9,493.79	18,352.51	21,078.99	66,494.00
33-W	TVA	10.05	10.05	2.51	1.59	—	—	—	103.06	11,878.55	2,866.45	1,914.48	596.77	8,254.45	31,774.00
34-W	Construction	3,967.28	730.09	55,532.33	0.29	8,248.64	6,541.20	21,339.99	7,171.97	20,045.11	—	537.51	3,394.64	107,917.56	243,740.00

TABLE B-5

INTERREGIONAL TECHNICAL COEFFICIENTS, TENNESSEE ECONOMY, SECTORS 1-E - 30-E, 1963 (MODEL II)

Sect. No.	Producing Sectors	Purchasing Sectors & Sector Numbers: 1-E Livestock	2-E Crops	3-E Food & tobacco	18-E Textile	19-E Lumber	20-E Furniture	21-E Paper	22-E Chemicals & plastics	24-E Primary metals	25-E Fabricated metals	26-E Machinery & transp.	27-E Other manufacturing	28-E Mining	29-E Services	30-E Retail & wholesale
1-E	Livestock	.0280834	—	.1588334	.0001582	—	—	—	—	—	—	—	—	—	—	—
2-E	Crops	.4050133	—	.0492399	.0002038	—	—	—	—	—	—	—	—	—	.0074040	—
3-E	Food & tobacco	.1695403	—	.0119940	—	—	—	—	.0000740	—	—	—	—	—	.0010135	—
18-E	Textile	.0000721	.0001078	—	.0015026	.0001189	.0001587	—	.0000303	.0007970	.0004779	.0005782	.0021168	.0001390	.0000763	.0000099
19-E	Lumber	—	—	—	—	.0007155	.0074345	.0084897	—	—	.0042548	.0005140	—	—	—	—
20-E	Furniture	—	—	—	—	—	.0077371	—	—	—	—	—	—	—	.0003672	—
21-E	Paper	—	—	.0021386	.0022820	.0043469	.0056183	.0081574	.0006520	.0012766	.0016862	.0055981	.0188899	.0099451	—	—
22-E	Chemicals & plastics	—	.0258168	.0001019	.0019563	.0018829	.0061397	.0033705	.0034697	—	.0057634	.0222275	.0305453	.0001550	—	—
24-E	Primary metals	—	—	—	—	.0000343	—	.0008390	—	.0005318	.0052079	.0005474	.0007763	—	.0001608	—
25-E	Fabricated metals	—	.0003446	.0138501	.0000627	—	.0003736	—	.0002805	—	.0055259	.0039987	.0005554	—	.0003321	—
26-E	Machinery & transp.	—	—	.0019841	.0037712	.0000564	.0002019	.0000325	.0000150	.0004696	.0046348	.0100503	.0002304	.0015534	.0000190	.0000382
27-E	Other manufacturing	.0010617	.0008914	.0013905	.0032994	—	.0049399	.0037002	.0003952	.0023021	.0170285	.0060879	.0065238	.0013770	.0112658	.0050430
28-E	Mining	—	—	—	.0045376	—	—	—	—	—	—	—	—	—	—	—
29-E	Services	.0024547	.0002131	.0029150	.0084901	.0134490	.0002507	.0218714	.0062028	.0047583	.0159102	.0752253	.0508259	.0087445	.0746219	.0497325
30-E	Wholesale & retail	.0014196	—	—	.0036129	.0031711	.0026706	.0195572	.0026797	.0180352	.0060997	.0034579	.0106121	.0055456	.0173398	.0065357
31-E	Transp. & commun.	.0016541	.0021865	.0142074	.0102935	.0247958	.0117106	.0177623	.0077941	.0262425	.0196329	.1115185	.0263264	.0087757	.1315184	.0139764
32-E	Finance, ins. & real est.	.0233232	—	.0002204	.0003158	.0010171	.0014788	.0004427	.0022925	—	.0004327	.0077506	.0011006	.0027954	.0054471	.0049237
33-E	TVA	.0003391	.0000857	.0014473	.0033047	.0020008	.0014681	.0203265	.0027222	.0596651	.0025820	.0021734	.0055588	.0010386	.0049278	.0014548
34-E	Construction	—	—	—	.0109363	—	—	.1315859	.0008271	.0059006	.0007595	.0081704	.0013510	.0019495	—	.0020466
1-M	Livestock	—	—	—	.0003992	—	—	—	—	—	—	—	—	—	—	—
2-M	Crops	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3-M	Food & tobacco	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.0001393
18-M	Textile	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19-M	Lumber	—	—	—	—	—	.0001152	—	—	—	—	—	—	—	—	—
20-M	Furniture	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-M	Paper	—	—	—	.0124205	—	—	—	—	—	—	—	—	—	—	—
22-M	Chemicals & plastics	.0100457	.0153806	—	—	—	—	—	.0001004	—	—	.0009458	—	—	—	.0000365
24-M	Primary metals	—	—	—	—	—	—	—	—	—	.0000885	.0004993	—	—	—	—
25-M	Fabricated metals	—	—	—	—	—	—	—	—	.0010571	—	.0018180	—	—	.0000122	.0000049
26-M	Machinery & transp.	.0000639	—	—	.0000034	—	.0001069	—	—	—	.0002912	.0048986	.0006094	—	.0000333	.0002809
27-M	Other manufacturing	.0000326	—	.0000110	.0000086	.0001255	.0000339	.0000465	—	—	.0000693	.0003113	.0043636	—	.0010335	.0000679
28-M	Mining	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29-M	Services	—	—	—	—	—	—	—	—	—	—	—	—	—	.0072087	—
30-M	Wholesale & retail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31-M	Transp. & commun.	.0006829	—	—	.0000220	.0000250	.0000158	.0001083	.0000150	.0001077	.0000322	.0000222	.0000594	.0000375	.0001031	.0000394
32-M	Finance, ins. & real est.	—	—	—	—	.0068873	—	—	—	—	—	—	—	—	—	—
33-M	TVA	.0000713	.0000171	.0002882	.0000684	.0003825	.0002973	.0040245	.0005403	.0118063	.0005126	.0004260	.0010931	.0000221	.0010122	.0003076
34-M	Construction	—	—	—	—	—	—	—	—	—	—	—	—	—	.0022022	—
1-W	Livestock	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2-W	Crops	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3-W	Food & tobacco	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.0013411
18-W	Textile	—	—	—	.0000909	—	—	—	—	—	—	.0000156	—	—	—	—
19-W	Lumber	—	—	.0003894	—	.0003227	.00003456	—	—	.0015826	—	.0004643	—	—	—	—
20-W	Furniture	—	—	—	—	—	—	—	—	—	—	—	—	—	—	.0000021
21-W	Paper	—	—	—	—	—	—	—	.0040126	—	—	—	—	—	—	.0000396
22-W	Chemicals & plastics	.0227616	—	.0004032	—	.0009985	—	—	.0000029	—	.0011749	.0005900	.0000306	—	.0015245	—
24-W	Primary metals	—	—	—	—	.0001115	—	—	—	—	.0000996	.0002687	—	—	—	—
25-W	Fabricated metals	—	—	—	—	—	—	—	.0000399	—	—	.0000350	—	—	—	—
26-W	Machinery & transp.	—	—	—	—	—	—	—	.0000230	—	.0004004	.0034096	.0001040	—	.0000918	.0001681
27-W	Other manufacturing	—	—	—	.0000157	—	—	—	.0000634	—	—	.0004501	.0005813	—	.0000543	.0008603
28-W	Mining	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29-W	Services	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30-W	Wholesale & retail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31-W	Transp. & commun.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
32-W	Finance, ins. & real est.	—	—	—	—	—	—	—	—	—	—	—	—	.0000768	—	.0000066
33-W	TVA	.0000535	.0000171	.0002342	.0005379	.0003236	.0002416	.0003311	.0004434	.0009627	.0004177	.0003564	.0009071	.0000221	.0008001	.0002539
34-W	Construction	—	—	—	—	—	—	—	—	—	—	.0004955	—	—	.0000598	—

TABLE B-6

INTERREGIONAL TECHNICAL COEFFICIENTS, TENNESSEE ECONOMY, SECTORS 31-E - 25-M, 1963 (MODEL II)

Sect. No.	Producing Sectors	Purchasing Sectors & Sector Numbers													
		31-E Transp. & commun.	32-E Finance	33-E TVA	34-E Construction	1-M Livestock	2-M Crops	9-M Food & tobacco	18-M Textile	19-M Lumber	20-M Furniture	21-M Paper	22-M Chemicals & plastics	24-M Primary metals	25-M Fabricated metals
1-E	Livestock	—	—	—	—	—	—	.0135469	—	—	—	—	—	—	—
2-E	Crops	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3-E	Food & tobacco	—	—	—	—	—	—	.0009027	—	—	—	—	—	—	—
18-E	Textile	.0000781	—	—	.0002106	.0000092	.0000224	—	.0013093	.0000966	.0000680	—	.0000176	.0017753	.0001077
19-E	Lumber	—	—	—	.0129429	—	—	—	—	.0010092	.0022736	—	—	—	—
20-E	Furniture	—	—	.0000267	—	—	—	—	—	—	—	—	—	—	—
21-E	Paper	—	—	—	—	—	—	.0004564	.0009801	—	.0016807	—	—	—	—
22-E	Chemicals & plastics	—	—	.0000436	.0085983	—	—	.0001293	.0057016	—	—	.0039993	.0013381	.0011550	.0061846
24-E	Primary metals	—	—	.0001196	.0004230	—	—	—	—	.0000949	—	.0008868	—	.0002569	.0004784
25-E	Fabricated metals	—	—	.0000187	.0029854	—	—	.0000896	—	—	.0019023	—	—	—	.0001892
26-E	Machinery & transp.	—	.0000575	.0007186	.0025175	—	—	—	.0005528	.0001561	.0011125	—	—	—	.0004810
27-E	Other manufacturing	—	.0041638	.0074801	.0665915	.0001506	—	.0009911	.0050828	—	.0169505	—	—	—	.0127470
28-E	Mining	—	—	.1528914	.0393732	—	—	—	—	—	—	—	—	—	—
29-E	Services	.0124370	.3084806	—	.0064294	.0211223	—	—	—	—	—	—	—	—	—
30-E	Wholesale and retail	.0022270	.0023920	.0837480	.1046093	.0006694	—	.0132834	—	—	—	—	—	—	—
31-E	Transp. & commun.	.0278467	.2189219	.0218205	.0166076	.0000347	.0000212	.0000689	.0005148	—	.0010297	.0017241	.0005219	—	—
32-E	Finance, ins. & real est.	.0027024	.0981566	.0086653	.0070232	—	—	—	—	—	—	—	—	—	—
33-E	TVA	.0024272	.0089542	—	.0002253	.0002445	.0000996	.0012147	.0014881	.0014655	.0019680	.0015205	.0552760	.2042460	.0016423
34-E	Construction	—	—	.0014783	.1288165	—	—	—	—	—	—	—	—	—	—
1-M	Livestock	—	—	—	—	.0180965	—	.2455500	—	—	—	—	—	—	—
2-M	Crops	—	—	—	—	.3448946	—	.0353142	.0036112	—	—	—	—	—	—
3-M	Food & tobacco	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18-M	Textile	—	—	—	—	—	—	—	.0003344	—	—	—	—	—	—
19-M	Lumber	—	—	—	.0028576	—	—	.0007645	—	.0076862	.0216178	—	—	—	—
20-M	Furniture	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-M	Paper	—	—	—	—	—	—	—	.0364062	—	—	—	—	—	—
22-M	Chemicals & plastics	—	—	—	—	.0056143	.0441059	—	—	—	—	—	.0004464	—	.0000342
24-M	Primary metals	—	—	—	—	—	—	—	—	—	—	—	.0029044	—	.0013166
25-M	Fabricated metals	—	—	—	.0020476	—	—	—	—	—	—	—	.0000197	.0245081	.0001032
26-M	Machinery & transp.	—	—	.0000962	.0032632	.0000912	—	.0000190	.0001213	—	.0040097	.0002974	.0006138	.0251075	.0000656
27-M	Other manufacturing	.0030317	.0020937	.0000812	.0023246	.0001395	.0001250	.0009011	.0003293	.0007559	.0005182	.0002314	.0004785	—	.0030092
28-M	Mining	—	—	—	.0008944	—	—	—	—	—	—	—	.0479169	—	—
29-M	Services	—	—	—	—	.0096177	—	.0038773	.0067254	.0181552	.0258078	.0243708	—	—	.0457886
30-M	Wholesale & retail	—	—	—	—	.1764988	.1437298	—	.0391974	—	—	—	—	—	—
31-M	Transp. & commun.	.0000105	—	.0004969	.0006361	.0166903	.0041707	.0131262	.0102100	.0239555	.0090112	.0196143	.0046974	.0478123	.0090784
32-M	Finance, ins. & real est.	—	.0271882	—	—	—	—	—	—	.0006290	—	—	—	—	—
33-M	TVA	.0004780	.0017615	—	.0000451	.0000408	.0000249	.0002429	.0002901	.0003255	.0003785	.0002536	.0109298	.0404106	.0003422
34-M	Construction	—	—	—	.0072349	.0021666	—	—	—	—	—	—	—	—	—
1-W	Livestock	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2-W	Crops	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3-W	Food & tobacco	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18-W	Textile	—	—	—	—	—	—	—	.0002664	—	—	—	—	—	—
19-W	Lumber	.0001213	—	—	.0027845	—	—	.0002973	—	.0035325	.0014076	—	—	.0274367	—
20-W	Furniture	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-W	Paper	—	—	—	—	—	—	.0012310	.0002154	—	.0001939	—	.0011709	—	.0000877
22-W	Chemicals & plastics	—	—	.0000109	—	.0196168	—	.0012678	—	.0083699	—	.0003247	.0000130	—	.0021174
24-W	Primary metals	—	—	—	.0000026	—	—	—	—	.0003087	—	—	—	—	.0007281
25-W	Fabricated metals	—	—	—	.0004258	—	—	.0003827	—	—	—	—	.0002691	—	—
26-W	Machinery & transp.	—	—	—	.0052424	—	—	—	—	—	—	—	.0001022	—	.0007215
27-W	Other manufacturing	—	—	—	.0068207	—	—	—	—	—	—	—	.0002819	—	—
28-W	Mining	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29-W	Services	—	—	—	—	.0020432	—	—	—	—	—	—	—	—	—
30-W	Wholesale & retail	—	—	—	.0031989	—	—	—	—	—	—	—	—	—	—
31-W	Transp. & commun.	—	—	—	.0000077	—	—	—	—	—	—	—	—	—	—
32-W	Finance, ins. & real est.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33-W	TVA	.0003973	.0014679	—	.0000360	.0000408	.0000249	.0001944	.0002396	.0002442	.0003026	.0002536	.0089973	.0333828	.0002737
34-W	Construction	—	—	—	.0142230	—	—	—	—	—	—	—	—	—	—

TABLE B-7

INTERREGIONAL TECHNICAL COEFFICIENTS, TENNESSEE ECONOMY, SECTORS 26-M - 19-W, 1963 (MODEL II)

		Purchasing Sectors & Sector Numbers													
Sect. No.	Producing Sectors	26-M Machinery & transp.	27-M Other manu-facturing	28-M Mining	29-M Services	30-M Retail & wholesale	31-M Transp. & commun.	32-M Finance	33-M TVA	34-M Construction	1-W Livestock	2-W Crops	3-W Food & tobacco	18-W Textile	19-W Lumber
1-M	Livestock	—	—	—	—	—	—	—	—	—	—	—	.0334746	—	—
2-M	Crops	—	—	—	—	—	—	—	—	—	—	—	.0003016	—	—
3-M	Food & tobacco	—	—	—	.0001688	—	—	—	—	—	—	—	.0006859	—	—
18-M	Textile	.0001761	.0006048	.0000889	.0000191	.0000017	.0000178	—	—	.0000295	.0000310	.0000145	—	.0007278	.0000248
19-M	Lumber	.0006661	—	—	—	—	—	—	—	.0046805	—	—	—	—	.0003422
20-M	Furniture	—	—	—	.0000137	—	—	—	.0000270	—	—	—	—	—	—
21-M	Paper	.0027636	.0041249	—	—	—	—	—	—	—	—	—	.0002312	—	—
22-M	Chemicals & plastics	.0155689	.0000528	.0003465	—	—	—	—	.0000550	.0056484	—	—	.0000982	.0215910	—
24-M	Primary metals	.0002695	.0002254	—	.0000494	—	—	—	.0001099	.0004471	—	—	—	—	.0000402
25-M	Fabricated metals	.0000101	—	—	.0000756	—	.0002091	—	.0000315	.0003690	.0000694	—	.0000464	—	—
26-M	Machinery & transp.	.0002395	.0353951	.0065071	.0000415	.0000029	—	—	.0006824	.0016836	—	—	—	—	.0000529
27-M	Other manufacturing	.0010219	.0090490	—	.0007450	.0002837	—	.0000304	.0074779	.0060351	.0002553	—	.0014247	.00006089	—
28-M	Mining	—	—	—	—	—	—	—	.0572486	—	—	—	—	—	—
29-M	Services	—	—	—	.0134109	.0000157	—	.0013139	—	—	—	—	—	—	—
30-M	Wholesale & retail	—	—	—	—	—	—	—	—	.0019286	.0006913	—	—	—	—
31-M	Transp. & commun.	.0000086	.0001366	—	.0050659	.0000032	.0001684	—	.0005342	—	—	—	.0000419	.0004795	—
32-M	Finance, ins. & real est.	—	—	—	—	—	—	.0000351	—	—	—	—	—	—	—
33-M	TVA	.0067734	.0066576	.0019769	.0114900	.0015871	.0028422	.0069358	—	.0002739	.0002418	.0003449	.0003999	.0012595	.0003037
34-M	Construction	.0003359	—	—	—	—	—	—	.0013424	.0036561	—	—	—	—	—
1-M	Livestock	—	—	—	—	—	—	—	—	—	—	—	.0044968	—	—
2-M	Crops	—	—	—	.0303189	—	—	—	—	—	—	—	.0018232	—	—
3-M	Food & tobacco	—	—	—	—	.0012085	—	—	—	—	—	—	—	—	—
18-M	Textile	—	—	—	—	—	—	—	—	—	—	—	—	.0009489	—
19-M	Lumber	.0023720	.0003160	—	—	—	—	—	—	.0094497	—	—	.0003638	—	.0032517
20-M	Furniture	—	—	—	—	.0011147	—	—	—	—	—	—	—	—	—
21-M	Paper	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-M	Chemicals & plastics	.0043533	—	—	—	.0000594	—	—	—	.0018698	.0107200	.0105975	—	—	—
24-M	Primary metals	.0011484	—	—	—	—	.0005514	—	—	.0005493	—	—	—	—	—
25-M	Fabricated metals	.0061633	—	—	.0001918	.0000542	—	—	—	.0109096	—	—	—	—	—
26-M	Machinery & transp.	.0806933	.0022821	—	.0000678	.0004277	.0000232	—	.0001287	.0176529	.0001236	—	.0000048	.0000188	—
27-M	Other manufacturing	.0138221	.0546028	—	.0064746	.0009949	.0078198	.0282780	.0000947	.0453410	.0000841	—	.0000211	.0000181	.0001514
28-M	Mining	—	.0125731	—	—	.0000922	—	—	—	.0155363	—	—	—	—	—
29-M	Services	.0103491	.0153187	.0800433	.0779616	.0677232	.0055955	.0090053	.0326835	.0369346	—	—	—	.0005140	—
30-M	Wholesale & retail	.0312357	—	—	.0077358	.0202976	—	—	—	.0011639	—	—	—	—	—
31-M	Transp. & commun.	.0294763	.0073867	.0120213	.0707240	.0058035	.0095755	.0714749	.0058760	.0086551	.0017327	—	—	.0008263	—
32-M	Finance, ins. & real est.	—	—	—	.0000021	.0013331	.0000019	.0699328	—	.0009649	.0010405	.0006038	—	—	.0005013
33-M	TVA	.0013466	.0013154	.0003952	.0022789	.0003122	.0005645	.0013629	—	.0000548	.0000345	.0000647	.0000800	.0002519	.0000552
34-M	Construction	—	—	.0089382	.0051231	—	.0038205	.0041991	—	.1562645	—	—	—	—	—
1-W	Livestock	—	—	—	—	—	—	—	—	—	.0196888	—	.1193686	.0001928	—
2-W	Crops	—	—	—	—	—	—	—	—	—	.4108830	—	.1384640	.0657354	—
3-W	Food & tobacco	—	—	—	—	.0020421	—	—	—	—	—	—	—	—	—
18-W	Textile	.0000181	—	—	—	—	—	—	—	—	—	—	—	.0004637	—
19-W	Lumber	.0007571	—	—	—	—	.0003919	—	—	.0033902	—	—	.0017133	—	.0045682
20-W	Furniture	.0000345	—	—	—	.0000032	—	—	—	—	—	—	—	—	—
21-W	Paper	—	—	—	—	.0000603	—	—	—	—	—	—	.0040355	.0060239	—
22-W	Chemical & plastics	.0007924	.0004754	—	.0055014	.0002115	—	—	—	.0006014	.0011201	.0000283	.0004131	—	.0056768
24-W	Primary metals	.0006386	—	—	—	—	—	—	—	.0000032	—	—	—	—	.0001047
25-W	Fabricated metals	.0000404	—	—	—	—	—	—	—	—	—	—	—	—	—
26-W	Machinery & transp.	.0104248	.0000898	—	.0001606	.0002560	—	—	—	.0068640	—	—	—	—	—
27-W	Other manufacturing	.0006086	.0035172	—	.0001429	.0013903	—	—	—	.0166630	—	—	—	.0000438	—
28-W	Mining	—	—	—	.0000202	—	—	—	—	.0001777	—	—	—	—	—
29-W	Services	—	—	—	—	—	—	—	—	—	.0692460	.0040433	.0003483	.0271723	.0005039
30-W	Wholesale & retail	—	—	—	—	—	—	—	—	.0002417	—	—	—	.0081699	—
31-W	Transp. & commun.	—	—	.0084065	—	—	—	—	—	.0000093	.0007342	.0003208	.0090625	.0218412	.0127727
32-W	Finance, ins. & real est.	—	—	.0003437	.0000471	.0000617	—	.0005382	—	.0006898	.0030481	—	.0001699	.0002548	.0033594
33-W	TVA	.0011054	.0010744	.0002965	.0018655	.0002825	.0004655	.0011206	—	.0000438	.0000345	.0000539	.0000677	.0002039	.0000552
34-W	Construction	.0005727	—	—	.0001046	—	—	—	—	.0031818	—	—	—	—	—

TABLE B-8

INTERREGIONAL TECHNICAL COEFFICIENTS, TENNESSEE ECONOMY, SECTORS 20-W - 34-W, 1963 (MODEL II)

Sect. No.	Producing Sectors	Purchasing Sectors & Sector Numbers: 20-W Furniture	21-W Paper	22-W Chemicals & plastics	24-W Primary metals	25-W Fabricated metals	26-W Machinery & transp.	27-W Other manufacturing	28-W Mining	29-W Services	30-W Retail & wholesale	31-W Transp. & commun.	32-W Finance	33-W TVA	34-W Construction
1-E	Livestock	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2-E	Crops	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3-E	Food & tobacco	---	---	---	---	---	---	---	---	.0001194	---	---	---	---	---
18-E	Textile	.0000910	---	.0000478	.0010377	.0003165	.0000909	.0000062	.0001574	.0000202	.0000023	.0000146	---	---	.0000417
19-E	Lumber	.0015195	---	---	---	---	---	---	---	---	---	---	---	---	.0081976
20-E	Furniture	---	---	---	---	---	---	---	---	---	---	---	---	.0000340	---
21-E	Paper	---	.0002869	---	---	---	.0001364	.0018027	---	---	---	---	---	---	---
22-E	Chemicals & plastics	---	.0005050	.0020819	.0004339	.0140546	.0096554	---	---	---	---	---	---	.0000692	.0001750
24-E	Primary metals	---	.0001679	---	.0000958	.0004479	.0003973	.0000121	---	---	---	---	---	.0001152	.0005352
25-E	Fabricated metals	.0002544	---	---	---	.0003539	.0000107	---	---	.0000264	---	---	---	.0000397	.0001503
26-E	Machinery & transp.	.0005496	---	---	---	.0000410	.0000742	---	---	.0000294	.0000020	---	---	.0007078	.0014907
27-E	Other manufacturing	.0001539	---	---	.0013062	.0008756	.0009823	.0004156	---	.0015661	.0001404	---	.0000379	.0074803	.0029022
28-E	Mining	---	---	---	---	---	---	---	---	---	---	---	---	.0573057	---
29-E	Services	---	---	---	---	---	---	---	---	.0022314	.0000109	---	.0008199	---	---
30-E	Wholesale & retail	---	---	---	---	---	---	---	---	---	---	---	---	.0006729	---
31-E	Transp. & commun.	.0006882	.0003265	.0008507	---	---	---	.0001877	---	---	---	---	---	---	---
32-E	Finance, ins. & real est.	---	---	---	---	---	---	---	---	---	---	---	.0086084	---	.0001952
33-E	TVA	.0004047	.0036720	.0009578	.0168297	.0004481	.0006813	.0008968	.0015170	.0011772	.0003104	.0005668	.0015122	---	.0000619
34-E	Construction	---	---	---	---	.0177830	---	---	---	---	---	---	---	.0013439	.0000904
1-M	Livestock	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2-M	Crops	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3-M	Food & tobacco	---	---	---	---	---	---	---	---	---	.0000613	---	---	---	---
18-M	Textile	---	---	---	---	---	---	---	---	---	---	---	---	---	---
19-M	Lumber	.0032803	---	---	---	---	.0004975	.0004342	---	---	---	---	---	---	.0040029
20-M	Furniture	---	---	---	---	---	---	---	---	---	---	---	---	---	---
21-M	Paper	---	---	---	---	---	---	---	---	---	---	---	---	---	---
22-M	Chemicals & plastics	---	---	.0007277	---	---	---	---	---	---	.0000384	---	---	---	.0003912
24-M	Primary metals	---	---	---	---	.0008769	.0000962	---	---	---	---	---	---	---	---
25-M	Fabricated metals	---	---	---	.0068841	---	.0025100	---	---	.0000151	.0000052	---	---	---	.0026492
26-M	Machinery & transp.	.0000396	.0000188	---	---	.0002045	.0017331	.0007230	---	.0000412	.0002952	.0000042	---	.0001215	.0042976
27-M	Other manufacturing	.0001232	.0000584	---	---	.0001558	.0019952	.0039764	---	.0013020	.0000541	.0027125	.0036414	.0000793	.0006800
28-M	Mining	---	---	---	---	---	---	.0231207	---	---	.0000636	---	---	---	---
29-M	Services	.0010839	.0005142	---	---	---	.0004562	.0017700	---	.0064047	.0043842	---	---	---	.0004419
30-M	Wholesale & retail	---	---	---	---	---	---	---	---	---	---	---	---	---	---
31-M	Transp. & commun.	.0001290	---	.0036382	.0056127	.0022318	.0059121	---	.0080374	.0030544	.0004734	---	---	---	.0431861
32-M	Finance, ins. & real est.	---	---	---	---	---	---	---	---	---	---	---	.0193854	---	---
33-M	TVA	.0001012	.0007200	.0001915	.0032996	.0000639	.0001384	.0001655	.0003500	.0002325	.0000616	.0001134	.0003024	---	.0000103
34-M	Construction	---	---	---	---	---	---	---	.0105505	.0019929	---	---	.1697516	---	.0003786
1-W	Livestock	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2-W	Crops	---	---	---	---	---	---	---	---	.0360146	---	---	---	---	---
3-W	Food & tobacco	---	---	---	---	---	---	---	---	---	.0018178	---	---	---	---
18-W	Textile	---	---	.0001818	---	---	.0004546	---	---	---	---	---	---	---	---
19-W	Lumber	.0126392	---	---	.0106209	---	.0037058	---	---	---	---	.0003913	---	---	.0044898
20-W	Furniture	---	---	---	---	---	.0000366	---	---	---	---	---	---	---	---
21-W	Paper	.0287288	.0395162	.0040899	---	.0132281	.0016093	.0006716	---	---	.0000022	---	---	---	---
22-W	Chemicals & plastics	.0003548	.0002635	.0008929	.0023144	.0066540	.0017768	.0000726	---	---	.0002410	---	---	---	.0002554
24-W	Primary metals	---	---	---	---	.0101131	.0044909	---	---	.0073979	.0004353	.0000095	---	---	.0019772
25-W	Fabricated metals	---	---	.0138665	---	---	.0127588	---	---	---	---	---	---	---	.0001112
26-W	Machinery & transp.	---	---	.0001666	---	.0106760	.0069476	.0022219	---	---	---	---	---	---	.0288978
27-W	Other manufacturing	---	---	.0083243	---	---	.0107660	.0013793	---	.0008803	.0031947	---	---	---	.0134168
28-W	Mining	---	---	---	---	---	---	.0120607	---	.0014805	.0076190	---	---	---	.0309586
29-W	Services	.0006021	---	.0006925	---	.0024551	.0198854	.0043211	---	.0016387	---	---	---	---	.0568500
30-W	Wholesale & retail	.0013239	---	.0362455	.0562297	.0223051	.0591268	---	---	.0233914	.0160092	.0006512	.0090202	---	.0306096
31-W	Transp. & commun.	.0181108	.0121232	.0267707	.0371841	.0169280	.0392482	.0158862	.0794699	.0306485	.0047448	---	---	---	.4332099
32-W	Finance, ins. & real est.	---	---	---	---	---	.0087450	---	.0148846	.0418499	.0049563	.0047881	.0752933	.0044404	.0162605
33-W	TVA	.0000505	.0006000	.0001703	.0028047	.0000639	.0001171	.0001517	.0004057	.0012976	.0004925	.0006568	.0146758	---	.0029141
34-W	Construction	---	---	---	---	---	.0109507	---	.0002335	.0001950	.0000513	.0000918	.0002268	---	.0000103
									---	.0160828	---	---	---	---	.2278343

TABLE B-9

INTERREGIONAL INTERDEPENDENCE COEFFICIENTS, TENNESSEE ECONOMY, SECTORS 1-E - 30-E, 1963 (MODEL II)

Sect. No.	Producing Sectors	Purchasing Sectors & Sector Numbers															
		1-E	2-E	3-E	18-E	19-E	20-E	21-E	22-E	24-E	25-E	26-E	27-E	28-E	29-E	30-E
		Livestock	Crops	Food & tobacco	Textile	Lumber	Furniture	Paper	Chemicals & plastics	Primary metals	Fabricated metals	Machinery & transp.	Other manufacturing	Mining	Services	Retail & wholesale
1-E	Livestock	1.05858360	.00000985	.17018036	.00017809	.00000297	.00000059	.00000716	.00001420	.00000268	.00000398	.00001610	.00001145	.00000236	.00018878	.00005994
2-E	Crops	.43778403	1.00000430	.12024782	.00035483	.00001870	.00001397	.00022147	.00006924	.00005809	.00014986	.00066646	.00043776	.00008729	.00818113	.00044910
3-E	Food & tobacco	.18166587	.00000259	1.04134900	.00004127	.00001686	.00000947	.00003183	.00008587	.00000841	.00002159	.00009544	.00006392	.00001233	.00114901	.00006978
18-E	Textile	.00013430	.00011164	.00008077	1.00152270	.00012518	.00017409	.00007331	.00003379	.00081314	.00053095	.00062867	.00215054	.00014697	.00012481	.00002983
19-E	Lumber	.00001734	.00000238	.00008848	.00019529	1.00076300	.00756173	.01057850	.00002129	.00010858	.00432036	.00073582	.00022823	.00013678	.00002333	.00003399
20-E	Furniture	.00000500	.00000024	.00000240	.00000413	.00000592	1.00779830	.00001155	.00000307	.00000480	.00000748	.00003289	.00002173	.00000433	.00040261	.00002112
21-E	Paper	.00045265	.00003783	.00233079	.00247815	.00440032	.00585102	1.00866290	.00067976	.00146545	.00211297	.00591619	.01926244	.01007721	.00026636	.00012332
22-E	Chemicals & plastics	.01153578	.00596104	.00348849	.01242651	.00193126	.00642161	.00525454	1.00352090	.00021589	.00651438	.02307923	.03106221	.00032137	.00063372	.00022671
24-E	Primary metals	.00001915	.00000295	.00008234	.00002769	.00004191	.00001241	.00093818	.00000559	1.00055440	.00526296	.00061804	.00081635	.00001475	.00019055	.00001587
25-E	Fabricated metals	.00269303	.00035482	.01455890	.00012847	.00000890	.00038770	.00048180	.00029074	.00003070	1.00559860	.00413683	.00060813	.00002310	.00039224	.00003129
26-E	Machinery & transp.	.00039629	.00000985	.00216562	.00386909	.00008057	.00021917	.00049810	.00002612	.00057369	.00473579	1.01025430	.00044492	.00158606	.00011384	.00006174
27-E	Other manufacturing	.00214316	.00093556	.00216564	.00444345	.00030010	.00516972	.01477356	.00062882	.00360767	.01768497	.00816581	1.00783190	.00188145	.01259504	.00597845
28-E	Mining	.00036656	.00018222	.00036626	.00567664	.00043311	.00033644	.00948516	.00054002	.01018706	.00062457	.00103122	.00133201	1.00037070	.00105596	.00042905
29-E	Services	.01328010	.00054338	.00628893	.01078156	.01575381	.00183300	.02930476	.00800286	.00761942	.01986388	.08848026	.05801361	.01157396	1.08699320	.05685748
30-E	Wholesale & retail	.00211281	.00019142	.00079777	.00571347	.00390508	.00323537	.03855586	.00325534	.02431041	.00737733	.00709272	.01340435	.00656460	.02000883	1.00812590
31-E	Transp. & commun.	.01383153	.00262415	.01846372	.01340530	.02820845	.01342047	.02747203	.00991097	.03037720	.02476940	.13109609	.03673662	.01195821	.14958145	.02379833
32-E	Finance, ins. & real est.	.02761334	.00009048	.00481526	.00071685	.00136752	.00178246	.00243341	.00268625	.00094464	.00084614	.00984272	.00196081	.00330803	.00720948	.00596738
33-E	TVA	.00208296	.00103742	.00202032	.00356855	.00234617	.00172914	.02103590	.00286712	.05993211	.00329763	.00356146	.00659980	.00138994	.00603752	.00191342
34-E	Construction	.00010824	.00003699	.00040137	.01303722	.00068563	.00091490	.15255564	.00107371	.00722156	.00134316	.01045149	.00458962	.00379923	.00014046	.00240379
1-M	Livestock	.00000016	.00000005	.00000005	.00040747	.00000021	.00000020	.00000165	.00000015	.00000133	.00000052	.00000062	.00000143	.00000033	.00000091	.00000133
2-M	Crops	.00000669	.00000237	.00000263	.00015473	.00000706	.00000116	.00001640	.00000280	.00001717	.00000614	.00002863	.00001913	.00000326	.00026481	.00003639
3-M	Food & tobacco	.00000036	.00000003	.00000012	.00000093	.00000055	.00000046	.00000549	.00000046	.00000340	.00000105	.00000124	.00000191	.00000092	.00002293	.00001046
18-M	Textile	.00000001	.00000001	.00000001	.00000009	.00000001	.00000001	.00000001	.00000001	.00000001	.00000001	.00000002	.00000001	.00000001	.00000001	.00000001
19-M	Lumber	.00000149	.00000026	.00000292	.00004041	.00000420	.00012132	.00046819	.00000358	.00002772	.00000588	.00005341	.00001905	.00001217	.00002960	.00001079
20-M	Furniture	.00000001	.00000001	.00000001	.00000011	.00000001	.00000001	.00000003	.00000001	.00000001	.00000001	.00000019	.00000003	.00000001	.00000013	.00000003
21-M	Paper	.00000167	.00000139	.00000051	.01243941	.00000155	.00000216	.00000091	.00000042	.00001010	.00000659	.00000781	.00002671	.00000183	.00000155	.00000037
22-M	Chemicals & plastics	.01739546	.01539034	.00356655	.00002225	.00000356	.00000182	.00001319	.00010240	.00000373	.00001059	.00099407	.00001518	.00000362	.00014767	.00005252
24-M	Primary metals	.00005195	.00004481	.00001294	.00000244	.00000047	.00000032	.00000270	.00000043	.00000198	.00009198	.00051687	.00000134	.00000094	.00000280	.00000074
25-M	Fabricated metals	.00000403	.00000172	.00000589	.00003706	.00001063	.00000335	.00034369	.00000292	.00107569	.00002828	.00192140	.00001886	.00001220	.00004869	.00001525
26-M	Machinery & transp.	.00008834	.00001203	.00003281	.00007909	.00000770	.00011817	.00057148	.00000682	.00004639	.00034314	.00508202	.00066112	.00002604	.00011001	.00030552
27-M	Other manufacturing	.00021927	.00002371	.00011835	.00013966	.00048171	.00011955	.00072374	.00005846	.00016692	.00027814	.00106208	.00488140	.00008710	.00195991	.00028494
28-M	Mining	.00084242	.00073812	.00017419	.00001975	.00000876	.00000295	.00019626	.00000886	.00001198	.00000737	.00009037	.00008458	.00000681	.00008062	.00003181
29-M	Services	.00021826	.00007746	.00008581	.00046679	.00022952	.00003517	.00051253	.00008974	.00054526	.00019476	.00093522	.00061123	.00010205	.00871867	.00048533
30-M	Wholesale & retail	.00000562	.00000136	.00000215	.00010249	.00000324	.00000427	.00002663	.00000140	.00000865	.00001355	.00017413	.00002920	.00000227	.00011481	.00002657
31-M	Transp. & commun.	.00100025	.00000294	.00017783	.00034687	.00060231	.00004027	.00048187	.00003698	.00027889	.00008956	.00041617	.00019815	.00006519	.00082486	.00012001
32-M	Finance, ins. & real est.	.00080749	.00000268	.00014171	.00002281	.00745119	.00010843	.00015198	.00007874	.00002958	.00005693	.00029491	.00005933	.00009946	.00021425	.00017548
33-M	TVA	.00041714	.00020534	.00040254	.00070509	.00045125	.00034895	.00416477	.00056919	.01185795	.00065473	.00070348	.00130124	.00009202	.00123480	.00040033
34-M	Construction	.00005496	.00001053	.00002417	.00014654	.00008945	.00001392	.00140079	.00003144	.00008836	.00006628	.00033961	.00019725	.00008021	.00289798	.00017605
1-W	Livestock	.00000055	.00000003	.00000017	.00000100	.00000066	.00000053	.00000660	.00000053	.00000399	.00000123	.00000135	.00000221	.00000108	.00000332	.00016464
2-W	Crops	.00000239	.00000006	.00000057	.00000809	.00000117	.00000087	.00001513	.00000090	.00000647	.00000241	.00000750	.00000381	.00000184	.00000554	.00025573
3-W	Food & tobacco	.00000447	.00000026	.00000137	.00000809	.00000544	.00000436	.00005420	.00000439	.00003274	.00001009	.00001108	.00001814	.00000887	.00002728	.00135211
18-W	Textile	.00000443	.00000001	.00000083	.00009118	.00000020	.00000003	.00000044	.00000002	.00000011	.00000055	.00001773	.00000031	.00000006	.00000039	.00000012
19-W	Lumber	.00007578	.00000177	.00041267	.00004243	.00034252	.00035749	.00045881	.00000468	.00161640	.00002484	.00055807	.00002133	.00001376	.00003108	.00001406
20-W	Furniture	.00000001	.00000001	.00000001	.00000001	.00000001	.00000001	.00000014	.00000001	.00000005	.00000004	.00000032	.00000006	.00000002	.00000005	.00000213
21-W	Paper	.00017778	.00012732	.00003820	.00005769	.00001292	.00002710	.00002979	.00419347	.00000258	.00003394	.00011016	.00013187	.00000191	.00001188	.00004999
22-W	Chemicals & plastics	.02421884	.00000213	.00432909	.00003561	.00103076	.00001467	.00007879	.00001807	.00002836	.00122384	.00076662	.00012843	.00002007	.00171656	.00009435
24-W	Primary metals	.00000400	.00000012	.00000292	.00000199	.00111658	.00000874	.00001908	.00000064	.00000161	.00010874	.00029496	.00000168	.00000081	.00000112	.00000123
25-W	Fabricated metals	.00034142	.00000529	.00006191	.00001495	.00001518	.00000148	.00015946	.00004175	.00000804	.00002464	.00012407	.00005965	.00000445	.00002857	.00000647
26-W	Machinery & transp.	.00001945	.00000304	.00001952	.00009104	.00000782	.00000882	.00088144	.00003174	.00004961	.00043939	.00361114	.00015187	.00003000	.00013212	.00019702
27-W	Other manufacturing	.00022125	.00000735	.00004596	.00012847	.00002243	.00001422	.00122079	.00007669	.00008073	.00004861	.00063571	.00066202	.00003877	.00016134	.00090066
28-W	Mining	.00000300	.00000014	.00000113	.00001558	.00000112	.00000117	.00017633	.00000213	.00000871	.00000269	.00005948	.00001334	.00000463	.00000846	.00001396
29-W	Services	.00003490	.00000016	.00000720	.00001570	.00000359	.00000121	.00013573	.00000207	.00000798	.00001299	.00011796	.00001023	.00000450	.00001020	.00002384
30-W	Wholesale & retail	.00089443	.00000077	.00016505	.00011926	.00010809	.00000949	.00134263	.00001314	.00006556	.00009411	.00066719	.00005687	.00003562	.00011725	.00004081
31-W	Transp. & commun.	.00067984	.00000902	.00012926	.00001876	.00007806	.00000801	.00013417	.00005761	.00003346	.00006055	.00022551	.00003016	.00001062	.00006352	.00004297
32-W	Finance, ins. & real est.	.00000222	.00000033	.00000198	.00000244	.00000560	.00000148	.00002097	.00000055	.00000750	.00000439	.00003792	.00000220	.00000873	.00000453	.00000983
33-W	TVA	.00033751	.00017187	.00031994	.00057257	.00036645	.00026662	.00041183	.00046495	.00099597	.00048193	.00055970	.00101207	.00004922	.00097870	.00032809
34-W	Construction	.00000460	.00000084	.00000983	.00024580	.00001449	.00001743	.00283419	.00002105	.00013532	.00003637	.00090655	.00009307	.00007278	.00010213	.00005303

TABLE B-10

INTERREGIONAL INTERDEPENDENCE COEFFICIENTS, TENNESSEE ECONOMY, SECTORS 31-E - 25-M, 1963 (MODEL II)

Sect. No.	Producing Sectors	Purchasing Sectors & Sector Numbers: 31-E Transp.& commun.	32-E Finance	33-E TVA	34-E Construc-tion	1-M Livestock	2-M Crops	3-M Food & tobacco	18-M Textile	19-M Lumber	20-M Furniture	21-M Paper	22-M Chemicals & plastics	24-M Primary metals	25-M Fabricated metals
1-E	Livestock	.00000277	.00006555	.00000612	.00001118	.00002632	.00001361	.01450204	.00000442	.00000070	.00000121	.00000094	.00000053	.00000179	.00000192
2-E	Crops	.00011391	.00283069	.00008201	.00018248	.00018946	.00000737	.00609319	.00000697	.00000310	.00001325	.00000421	.00000579	.00001892	.00001355
3-E	Food & tobacco	.00001603	.00039768	.00001212	.00002778	.00003477	.00000481	.00341165	.00000391	.00000392	.00000687	.00000551	.00000176	.00000349	.00001105
18-E	Textile	.00008463	.00007616	.00004485	.00043285	.00002464	.00002486	.00001280	.00132477	.00003997	.00011008	.00000263	.00003132	.00179986	.00014682
19-E	Lumber	.00000087	.00001112	.00004888	.01514354	.00001611	.00000132	.00001183	.00001334	.00102065	.00233281	.00000189	.00000704	.00004182	.00000721
20-E	Furniture	.00000570	.00013972	.00003088	.00000889	.00000933	.00000034	.00000282	.00000046	.00000048	.00000111	.00000062	.00000246	.00000869	.00000141
21-E	Paper	.00002452	.00022262	.00170604	.00209450	.00002302	.00001033	.00050390	.00110486	.00001534	.00206382	.00001218	.00011926	.00049117	.00028321
22-E	Chemicals & plastics	.00001602	.00037682	.00038516	.01268275	.00012362	.00006814	.00037101	.00607406	.00003085	.00064894	.00402339	.00142145	.00185391	.00664443
24-E	Primary metals	.00000399	.00007281	.00013155	.00060677	.00000841	.00000151	.00000569	.00003907	.00009796	.00003197	.00088954	.00001249	.00041259	.00449835
25-E	Fabricated metals	.00000616	.00014057	.00003924	.00352618	.00001798	.00000301	.00014916	.00001159	.00000824	.00193407	.00000831	.00000698	.00002869	.00020974
26-E	Machinery & transp.	.00012421	.00027309	.00099033	.00324356	.00005615	.00003550	.00006602	.00059121	.00020594	.00118460	.00002742	.00041119	.00032193	.00063317
27-E	Other manufacturing	.00026065	.00919243	.00853600	.07832764	.00058881	.00009522	.00129670	.00520339	.00005557	.01722111	.00006027	.00065611	.00269057	.01299140
28-E	Mining	.00045942	.00225123	.15309332	.04549175	.00042112	.00051514	.00036838	.00033922	.00032017	.00045989	.00034066	.00974650	.03559444	.00051676
29-E	Services	.01512436	.37608796	.01065514	.02383062	.02389690	.00020684	.00697394	.00063391	.00035284	.00167427	.00048028	.00074032	.00238344	.00164769
30-E	Wholesale & retail	.00281562	.01114500	.08588083	.12288186	.00133888	.00026215	.01390762	.00029813	.00017157	.00054382	.00021213	.00484129	.01766212	.00054467
31-E	Transp. & commun.	1.03154710	.30214825	.02936814	.03047692	.00360730	.00022445	.00161882	.00110190	.00027243	.00227956	.00210348	.00231461	.00624712	.00119933
32-E	Finance, ins. & real est.	.00322626	1.11222850	.01075086	.01019005	.00018977	.00003456	.00052457	.00005752	.00002582	.00008649	.00044113	.00061701	.00222639	.00008605
33-E	TVA	.00264038	.01293945	1.00060680	.00148860	.00241693	.00295951	.00209267	.00187614	.00182715	.00257576	.00197469	.05612001	.20485410	.00295216
34-E	Construction	.00002017	.00011796	.00252493	1.14882090	.00003348	.00001173	.00013089	.00020948	.00001431	.00036420	.00001898	.00019254	.00070257	.00011922
1-M	Livestock	.00000015	.00000050	.00000354	.00000530	1.01844130	.00004578	.25008042	.00001323	.00000011	.00000022	.00000012	.00000024	.00000172	.00000028
2-M	Crops	.00000612	.00010663	.00000501	.00003770	.35213067	1.00035770	.12192473	.00396333	.00060875	.00086825	.00080747	.00014121	.00010282	.00151339
3-M	Food & tobacco	.00000040	.00000161	.00001197	.00001793	.00028469	.00017752	1.00007810	.00004923	.00000034	.00000066	.00000044	.00000077	.00000349	.00000084
18-M	Textile	.00000001	.00000001	.00000000	.00000000	.00000000	.00000000	.00000000	1.00033480	.00000000	.00000000	.00000000	.00000000	.00000000	.00000000
19-M	Lumber	.00000198	.00001371	.00000860	.00351935	.00003619	.00000555	.00078226	.00000357	1.00776040	.02180367	.00000357	.00000844	.00015663	.00000608
20-M	Furniture	.00000001	.00000005	.00000001	.00000018	.00026238	.00016371	.00007027	.00004537	.00000028	1.00000050	.00000038	.00000009	.00000095	.00000069
21-M	Paper	.00000105	.00000095	.00000056	.00000538	.00000031	.00000031	.00000016	.03643128	.00000050	.00000137	1.00000000	.00000039	.00002236	.00000182
22-M	Chemicals & plastics	.00000243	.00005260	.00000683	.00006041	.02129970	.04415244	.00703605	.00018019	.00003392	.00005826	.00003812	1.00045780	.00011847	.00010557
24-M	Primary metals	.00000014	.00000256	.00000104	.00001871	.00007650	.00013186	.00003215	.00000778	.00001476	.00001233	.00001263	.00291077	1.00008980	.00139504
25-M	Fabricated metals	.00000105	.00001969	.00000943	.00256934	.00005566	.00001635	.00001700	.00000862	.00000970	.00003680	.00001129	.00010416	.02467705	1.00016320
26-M	Machinery & transp.	.00001104	.00005845	.00014265	.00419333	.00027347	.00010007	.00010176	.00016383	.00001131	.00408145	.00031027	.00071975	.02543239	.00013293
27-M	Other manufacturing	.00334054	.00496595	.00028791	.00400771	.00104228	.00045262	.00138620	.00061907	.00119472	.00102183	.00063252	.00064926	.00096445	.00372148
28-M	Mining	.00004317	.00008533	.00000945	.00144500	.00111507	.00214197	.00037762	.00002396	.00002253	.00002045	.00001421	.04796308	.00002411	.00005932
29-M	Services	.00019946	.00350831	.00010421	.00114905	.02852292	.01105534	.01174626	.01136303	.02007644	.02863403	.02663087	.02465393	.00336598	.04991135
30-M	Wholesale & retail	.00000290	.00004670	.00000681	.00016118	.23537557	.14685900	.06303764	.04070188	.00024851	.00048392	.00033896	.00008113	.00085316	.00062085
31-M	Transp. & commun.	.00006469	.00271834	.00055595	.00223116	.02234662	.00613789	.01932099	.01212305	.02591252	.01182084	.02173273	.00593171	.04987981	.01286780
32-M	Finance, ins. & real est.	.00009445	.03251504	.00031503	.00042811	.00034696	.00021201	.00010762	.00006042	.00069277	.00003654	.00000212	.00001929	.00008411	.00000422
33-M	TVA	.00052059	.00256162	.00009387	.00028928	.00047277	.00059013	.00041585	.00036510	.00039741	.00049955	.00034361	.01109533	.04052537	.00060134
34-M	Construction	.00004221	.00118300	.00005705	.01000705	.00297604	.00012177	.00082780	.00012870	.00024690	.00023681	.00026204	.00057098	.00027959	.00036938
1-W	Livestock	.00000046	.00000185	.00001403	.00002234	.00005894	.00003656	.00001801	.00001022	.00000016	.00000021	.00000012	.00000082	.00000311	.00000028
2-W	Crops	.00000073	.00000301	.00002188	.00007139	.00016972	.00005680	.00004733	.00003365	.00000089	.00000047	.00000022	.00000148	.00000574	.00000126
3-W	Food & tobacco	.00000379	.00001512	.00011523	.00018345	.00048401	.00030027	.00014789	.00008354	.00000135	.00000176	.00000099	.00000669	.00002551	.00000233
18-W	Textile	.00000002	.00000014	.00000004	.00000320	.00000374	.00000004	.00000122	.00026676	.00000157	.00000019	.00000004	.00000009	.00000081	.00000080
19-W	Lumber	.00012610	.00004328	.00001250	.00339801	.00002427	.00000766	.00031555	.00000697	.00359191	.00150347	.00001186	.00008686	.02761105	.00006165
20-W	Furniture	.00000001	.00000003	.00000019	.00000067	.00000077	.00000047	.00000024	.00000014	.00000000	.00000015	.00000001	.00000004	.00000093	.00000004
21-W	Paper	.00000034	.00000502	.00000599	.00010203	.00013492	.00006572	.00133213	.00026737	.00003854	.00020650	.00035561	.00123023	.00001287	.00013144
22-W	Chemicals & plastics	.00002675	.00059945	.00002965	.00020698	.02026321	.00009527	.00661750	.00007400	.00857773	.00036167	.00014851	.00004521	.00025730	.00240437
24-W	Primary metals	.00000008	.00000050	.00000064	.00007113	.00000370	.00000044	.00000540	.00000040	.00031389	.00001297	.00000029	.00000397	.00003872	.00073228
25-W	Fabricated metals	.00000048	.00001013	.00000342	.00119303	.00029012	.00001398	.00047748	.00000190	.00011923	.00000664	.00000254	.00027190	.00000992	.00004387
26-W	Machinery & transp.	.00000326	.00005014	.00003614	.00657886	.00010730	.00004715	.00003823	.00001928	.00001018	.00005871	.00001009	.00012263	.00029704	.00074582
27-W	Other manufacturing	.00001644	.00008125	.00010168	.00899774	.00057613	.00022405	.00018337	.00006933	.00008630	.00003283	.00001331	.00030380	.00005420	.00006725
28-W	Mining	.00000032	.00000341	.00000403	.00132424	.00001534	.00000313	.00000460	.00000150	.00000178	.00000195	.00000106	.00000439	.00000300	.00000318
29-W	Services	.00000036	.00000408	.00000444	.00101635	.00217241	.00000545	.00053787	.00000952	.00001487	.00000343	.00000073	.00000579	.00002429	.00002128
30-W	Wholesale & retail	.00000205	.00004217	.00002561	.01007985	.00084848	.00000841	.00028007	.00000961	.00033608	.00002507	.00000864	.00001998	.00004740	.00018489
31-W	Transp. & commun.	.00000518	.00003307	.00000783	.00097312	.00068007	.00003347	.00024217	.00001629	.00029791	.00003806	.00001101	.00047980	.00053502	.00013117
32-W	Finance, ins. & real est.	.00000063	.00001980	.00001333	.00015289	.00002405	.00001137	.00000797	.00000361	.00001430	.00000737	.00000167	.00001992	.00010067	.00000986
33-W	TVA	.00043190	.00211593	.00007170	.00022579	.00040311	.00049372	.00033879	.00030032	.00030230	.00039515	.00031960	.00913201	.03347240	.00044676
34-W	Construction	.00000189	.00003766	.00004893	.02132368	.00006560	.00000311	.00001982	.00000695	.00000462	.00001638	.00000548	.00000924	.00003852	.00002213

TABLE B-11

INTERREGIONAL INTERDEPENDENCE COEFFICIENTS, TENNESSEE ECONOMY, SECTORS 26-M - 19-W, 1963 (MODEL II)

		Purchasing Sectors & Sector Numbers														
		26-M	27-M	28-M	29-M	30-M	31-M	32-M	33-M	34-M	1-W	2-W	3-W	18-W	19-W
Sect. No.	Producing Sectors	Machinery & transp.	Other manufacturing	Mining	Services	Retail & wholesale	Transp.& commun.	Finance	TVA	Construction	Live-stock	Crops	Food & tobacco	Textile	Lumber
1-M	Livestock	.00000382	.00000153	.00000299	.00003531	.00009447	.00000025	.00000074	.00000141	.00000257	.00000183	.00000011	.03555283	.00000168	.00000004
2-M	Crops	.00000691	.00003357	.00001629	.00014423	.00004933	.00000146	.00001495	.00001377	.00001664	.00000337	.00000025	.01504077	.00000354	.00000029
3-M	Food & tobacco	.00000518	.00000810	.00001749	.00020834	.00003288	.00000134	.00000817	.00000812	.00001200	.00000970	.00000056	.00679701	.00000583	.00000013
18-M	Textile	.00019806	.00068832	.00009735	.00003416	.00000601	.00002534	.00002435	.00002702	.00010533	.00004142	.00001505	.00001514	.00073496	.00002607
19-M	Lumber	.00072273	.00008024	.00003951	.00003735	.00006161	.00002410	.00003145	.00003218	.00570061	.00001755	.00000089	.00000717	.00000646	.00035097
20-M	Furniture	.00000075	.00000217	.00000203	.00002144	.00000158	.00000027	.00000119	.00002835	.00000154	.00000017	.00000005	.00000029	.00000019	.00000003
21-M	Paper	.00294258	.00483924	.00005557	.00008728	.00002786	.00004736	.00016991	.00073219	.00056138	.00001321	.00000229	.00028195	.00003603	.00000419
22-M	Chemicals & plastics	.01603768	.00130309	.00057902	.00011932	.00003310	.00004500	.00008532	.00034532	.00766007	.00004940	.00001604	.00055329	.02172036	.00002054
24-M	Primary metals	.00031655	.00027712	.00001553	.00006701	.00000610	.00000688	.00001414	.00012066	.00063389	.00000257	.00000027	.00000364	.00000257	.00004133
25-M	Fabricated metals	.00003157	.00016749	.00004314	.00011199	.00001228	.00021631	.00002608	.00005007	.00049147	.00007494	.00000027	.00015703	.00000819	.00000868
26-M	Machinery & transp.	.00079492	.03794171	.00665054	.00038239	.00007683	.00032318	.00121165	.00080628	.00426455	.00002584	.00000617	.00002269	.00001390	.00006588
27-M	Other manufacturing	.00147309	.01013144	.00025705	.00128391	.00043842	.00015781	.00050717	.00780024	.00844609	.00041863	.00001841	.00157529	.00070404	.00001375
28-M	Mining	.00141191	.00137467	.00054343	.00226244	.00044923	.00054502	.00140495	.05742039	.00056056	.00024065	.00016490	.00014501	.00026272	.00006015
29-M	Services	.00068099	.00437720	.00191708	.01616034	.00119122	.00017411	.00194986	.00172852	.00202272	.00028881	.00002412	.00069347	.00032604	.00003463
30-M	Wholesale & retail	.00091398	.00121332	.00036750	.00145379	.00026772	.00028942	.00075962	.00069996	.00323182	.00084264	.00008240	.00025537	.00020884	.00003475
31-M	Transp. & commun.	.00078690	.00592021	.00160767	.00835966	.00066024	.00037134	.00074710	.00192187	.00175097	.00012853	.00003777	.00063340	.00080713	.00004645
32-M	Finance, ins. & real est.	.00015202	.00048216	.00011365	.00027029	.00004143	.00003912	.00015973	.00023562	.00018051	.00005348	.00001062	.00094666	.00008064	.00003796
33-M	TVA	.00792830	.00765396	.00310640	.01301509	.00257728	.00312934	.00808192	.00058714	.00205976	.00138925	.00095093	.00082397	.00148469	.00034398
34-M	Construction	.00089278	.00114022	.00012983	.00008907	.00001596	.00003946	.00008637	.00180538	.00515674	.00001453	.00000356	.00005020	.00004209	.00000746
1-M	Livestock	.00001024	.00000043	.00000040	.00000427	.00031824	.00000005	.00000009	.00000018	.00000110	.00000013	.00000001	.00457879	.00000054	.00000002
2-M	Crops	.00044929	.00057547	.00265454	.03294966	.00243954	.00019745	.00036094	.00107859	.00156843	.00002075	.00000272	.00341092	.00002937	.00000348
3-M	Food & tobacco	.00003937	.00000056	.00000139	.00001645	.00123483	.00000015	.00000030	.00000064	.00000394	.00000032	.00000002	.00000167	.00000066	.00000002
18-M	Textile	.00000002	.00000000	.00000000	.00000000	.00000000	.00000000	.00000000	.00000000	.00000000	.00000000	.00000000	.00000000	.00094964	.00000000
19-M	Lumber	.00243962	.00035182	.00010956	.00007187	.00003429	.00004875	.00006800	.00000858	.01142710	.00001526	.00000061	.00037497	.00000417	.00329890
20-M	Furniture	.00003613	.00000036	.00000123	.00001497	.00113896	.00000010	.00000018	.00000050	.00000304	.00000002	.00000000	.00000148	.00000006	.00000000
21-M	Paper	.00000246	.00000855	.00000121	.00000042	.00000007	.00000031	.00000030	.00000034	.00000131	.00000051	.00000019	.00000370	.00000032	
22-M	Chemicals & plastics	.00442938	.00007470	.00014646	.00147648	.00018234	.00001838	.00002935	.00005001	.00239032	.01541773	.01060416	.00407498	.00071584	.00000600
24-M	Primary metals	.00120139	.00002782	.00002069	.00005212	.00000792	.00056008	.00004770	.00000559	.00071256	.00004686	.00003090	.00001227	.00000281	.00000062
25-M	Fabricated metals	.00630600	.00009683	.00015499	.00029072	.00007975	.00006709	.00007179	.00001641	.01315532	.00001768	.00000160	.00000366	.00000435	.00000872
26-M	Machinery & transp.	1.01093020	.00265204	.00024698	.00023655	.00046875	.00014343	.00019443	.00015044	.02142103	.00016664	.00000867	.00003254	.00003063	.00001382
27-M	Other manufacturing	.01472560	1.05812510	.00133961	.00850483	.00177855	.00862879	.03319333	.00048013	.05794667	.00034389	.00003537	.00011958	.00015945	.00027093
28-M	Mining	.00042604	.01340095	1.00020450	.00029688	.00016743	.00018373	.00051581	.00001515	.01974580	.00076181	.00050924	.00020050	.00004344	.00001603
29-M	Services	.01465212	.01897489	.08754782	1.08670160	.07527771	.00651172	.01190347	.03557184	.05171307	.00068217	.00008950	.00026891	.00084773	.00011441
30-M	Wholesale & retail	.03241511	.00031927	.00110208	.01343123	1.02174350	.00090945	.00016018	.00044427	.00273063	.00001480	.00000141	.00132883	.00005024	.00000269
31-M	Transp. & commun.	.03177211	.00953102	.01854436	.07802514	.01155779	1.01028210	.07877830	.00849994	.01422541	.00235012	.00013062	.00045980	.00104058	.00016664
32-M	Finance, ins. & real est.	.00006097	.00001599	.00002507	.00003864	.00146862	.00000873	1.07521510	.00000830	.00131178	.00148577	.00064974	.00030182	.00005293	.00061975
33-M	TVA	.00157523	.00151236	.00061921	.00258165	.00050847	.00062123	.00158901	1.00010570	.00840898	.00025960	.00018446	.00016168	.00029620	.00006333
34-M	Construction	.00027009	.00023412	.01129189	.00701094	.00053757	.00461817	.00591082	.00027611	1.18606240	.00086670	.00002120	.00016085	.00014427	.00069750
1-W	Livestock	.00000846	.00000029	.00000035	.00000365	.00025413	.00000007	.00000017	.00000023	.00000191	1.02008520	.00000005	.12176649	.00019887	.00000006
2-W	Crops	.00002446	.00000145	.00000113	.00000656	.00039471	.00000021	.00000059	.00000045	.00002099	.42180926	1.00014940	.18884965	.06686999	.00002063
3-W	Food & tobacco	.00006948	.00000241	.00000285	.00002996	.00208700	.00000060	.00000139	.00000190	.00001567	.00000670	.00000042	1.00000380	.00001740	.00000049
18-W	Textile	.00002333	.00000095	.00000026	.00000122	.00000026	.00000004	.00000007	.00000006	.00000461	.00000037	.00000002	.00000029	1.00046420	.00000105
19-W	Lumber	.00088002	.00003248	.00005475	.00006003	.00001409	.00042978	.00005415	.00001075	.00419844	.00001457	.00000162	.00173139	.00001338	1.00461000
20-W	Furniture	.00003542	.00000011	.00000002	.00000006	.00000329	.00000001	.00000001	.00000000	.00000108	.00000002	.00000000	.00000001	.00000002	.00000000
21-W	Paper	.00010275	.00001174	.00000538	.00003112	.00007969	.00000061	.00000113	.00000258	.00007652	.00002891	.00001343	.00421618	.00637053	.00002579
22-W	Chemicals & plastics	.00096469	.00064469	.00049925	.00602461	.00064697	.00004680	.00009026	.00020033	.00123772	.00171589	.00006013	.00154896	.00022492	.00574269
24-W	Primary metals	.00070226	.00001359	.00000286	.00000261	.00000184	.00000054	.00000086	.00000054	.00008068	.00000157	.00000011	.00000074	.00000063	.00010745
25-W	Fabricated metals	.00021929	.00001608	.00001078	.00009239	.00001373	.00000179	.00000289	.00000508	.00027985	.00007417	.00000628	.00002879	.00002216	.00008019
26-W	Machinery & transp.	.01066852	.00027684	.00012096	.00024140	.00028901	.00003744	.00005393	.00002364	.00861978	.00010802	.00000691	.00001657	.00006639	.00000875
27-W	Other manufacturing	.00089079	.00377984	.00021991	.00038636	.00145900	.00011095	.00022222	.00003345	.02035265	.00021819	.00001430	.00004521	.00018393	.00006386
28-W	Mining	.00006422	.00004926	.00001029	.00003836	.00002030	.00000352	.00000567	.00000347	.00075036	.00021260	.00001190	.00002838	.00008234	.00000268
29-W	Services	.00027304	.00002607	.00001604	.00002321	.00003606	.00000250	.00000900	.00000259	.00049229	.07421131	.00414688	.00981026	.02831988	.00056828
30-W	Wholesale & retail	.00113049	.00007049	.00005921	.00032125	.00005187	.00001487	.00002167	.00002720	.00316983	.00304841	.00016912	.00045229	.00936188	.00024197
31-W	Transp. & commun.	.00055539	.00021240	.00850385	.00020365	.00008421	.00001497	.00006507	.00000914	.00114395	.00436319	.00050716	.00983847	.02334216	.01334067
32-W	Finance, ins. & real est.	.00010494	.00000892	.00086889	.00006125	.00007284	.00000555	.00059314	.00000680	.00094994	.00326525	.00000678	.00057599	.00031953	.00343585
33-W	TVA	.00128276	.00121887	.00047968	.00211303	.00044366	.00051192	.00130561	.00008380	.00032646	.00022031	.00015251	.00013891	.00024035	.00006148
34-W	Construction	.00092681	.00005603	.00006743	.00018328	.00001804	.00002155	.00002958	.00004036	.00544865	.00155131	.00008665	.00020628	.00059233	.00001504

TABLE B-12

INTERREGIONAL INTERDEPENDENCE COEFFICIENTS, TENNESSEE ECONOMY, SECTORS 20-W - 34-W, 1963 (MODEL II)

		Purchasing Sectors and Sector Numbers													
Sect. No.	Producing Sectors	20-W Furniture	21-W Paper	22-W Chemicals & plastics	24-W Primary metals	25-W Fabricated metals	26-W Machinery & transp.	27-W Other manufacturing	28-W Mining	29-W Services	30-W Retail & wholesale	31-W Transp.& commun.	32-W Finance	33-W TVA	34-W Construction
1-E	Livestock	.00000018	.00000006	.00000251	.00000406	.00000213	.00000514	.00000035	.00000534	.00002428	.00006641	.00000003	.00000143	.00000025	.00003901
2-E	Crops	.00000105	.00000056	.00000154	.00000819	.00000574	.00000467	.00000166	.00000272	.00003666	.00002931	.00000019	.00003532	.00000909	.00002395
3-E	Food & tobacco	.00000047	.00000023	.00000093	.00000138	.00000255	.00000498	.00000151	.00000142	.00013228	.00001573	.00000012	.00000785	.00000131	.00001549
18-E	Textile	.00009314	.00000071	.00005390	.00104554	.00034197	.00010964	.00001511	.00015957	.00002990	.00000401	.00001661	.00002365	.00002587	.00010073
19-E	Lumber	.00153038	.00000348	.00000458	.00000576	.00027396	.00013995	.00002388	.00006125	.00019041	.00000466	.00000117	.00098507	.00003096	.01067719
20-E	Furniture	.00000009	.00000018	.00000007	.00000077	.00000027	.00000017	.00000017	.00000010	.00000117	.00000014	.00000003	.00000193	.00003471	.00000046
21-E	Paper	.00002464	.00031002	.00002275	.00006540	.00007687	.00021153	.00185480	.00001167	.00005182	.00002138	.00001448	.00012544	.00072989	.00025423
22-E	Chemicals & plastics	.00004104	.00053230	.00230517	.00055194	.01450652	.01007635	.00007802	.00008835	.00012487	.00004793	.00000508	.00133349	.00035622	.00130422
24-E	Primary metals	.00000800	.00017597	.00000782	.00013158	.00047060	.00043117	.00001740	.00000728	.00001740	.00000252	.00000096	.00011184	.00012373	.00074719
25-E	Fabricated metals	.00025847	.00000061	.00000750	.00000484	.00042456	.00002684	.00000339	.00000772	.00003793	.00000180	.00000057	.00008786	.00005348	.00024008
26-E	Machinery & transp.	.00056650	.00000906	.00001074	.00003783	.00011579	.00020897	.00031205	.00005317	.00013731	.00001337	.00010492	.00091248	.00081756	.00205991
27-E	Other manufacturing	.00017635	.00005060	.00006040	.00161566	.00234308	.00122669	.00051858	.00012515	.00178233	.00019334	.00003642	.00166845	.00776043	.00422736
28-E	Mining	.00009914	.00067192	.00020215	.00295149	.00097942	.00019635	.00020394	.00028445	.00025340	.00007313	.00010333	.00042589	.05740103	.00021395
29-E	Services	.00012653	.00007146	.00006061	.00030150	.00063088	.00030874	.00019483	.00005534	.00274035	.00014632	.00002334	.00463955	.00120486	.00095190
30-E	Wholesale & retail	.00006511	.00034927	.00013516	.00148714	.00233833	.00018916	.00017451	.00017258	.00020528	.00004348	.00005314	.00082884	.00065238	.00032709
31-E	Transp. & commun.	.00087702	.00048980	.00095161	.00059306	.00079151	.00027863	.00036736	.00007661	.00054510	.00007025	.00003591	.00315769	.00179428	.00097602
32-E	Finance, ins. & real est.	.00001722	.00004518	.00002391	.00018945	.00023383	.00013636	.00002181	.00002401	.00005773	.00001400	.00001940	.00977748	.00022758	.00039107
33-E	TVA	.00056409	.00386045	.00109162	.01695126	.00100365	.00105075	.00111277	.00160865	.00144800	.00041939	.00059349	.00225491	.00014682	.00100669
34-E	Construction	.00001271	.00005982	.00029347	.00007661	.02046676	.00033512	.00029053	.00006268	.00004624	.00000721	.00000574	.00090135	.00180454	.00099534
1-M	Livestock	.00000008	.00000002	.00000090	.00000183	.00000081	.00000168	.00000007	.00000197	.00000103	.00002381	.00000001	.00000021	.00000004	.00001371
2-M	Crops	.00003896	.00001855	.00000845	.00002473	.00000685	.00004290	.00012449	.00003175	.00023021	.00016435	.00000204	.00028319	.00000052	.00015319
3-M	Food & tobacco	.00000011	.00000006	.00000228	.00000369	.00000183	.00000427	.00000020	.00000497	.00000270	.00006173	.00000001	.00000075	.00000010	.00003553
18-M	Textile	.00000000	.00000000	.00000017	.00000000	.00000001	.00000044	.00000000	.00000000	.00000000	.00000000	.00000000	.00000000	.00000000	.00000001
19-M	Lumber	.00334793	.00000035	.00000557	.00003633	.00007096	.00060786	.00044826	.00012263	.00011690	.00001010	.00000365	.00197281	.00000596	.00532442
20-M	Furniture	.00000002	.00000001	.00000000	.00000001	.00000002	.00000009	.00000008	.00000004	.00000012	.00000009	.00000000	.00000053	.00000001	.00000029
21-M	Paper	.00000116	.00000001	.00000068	.00001299	.00000425	.00000138	.00000019	.00000198	.00000037	.00000005	.00000021	.00000029	.00000032	.00000125
22-M	Chemicals & plastics	.00000319	.00000122	.00073191	.00000647	.00001141	.00003450	.00001192	.00003050	.00042480	.00006189	.00000080	.00041722	.00000166	.00059598
24-M	Primary metals	.00000056	.00000007	.00001649	.00001245	.00088046	.00011949	.00000201	.00001220	.00000667	.00000158	.00000017	.00012390	.00000061	.00008322
25-M	Fabricated metals	.00000197	.00000065	.00000412	.00688734	.00016804	.00363917	.00001781	.00014189	.00011026	.00001991	.00000187	.00226955	.00000656	.00357057
26-M	Machinery & transp.	.00004540	.00002120	.00002472	.00002461	.00033438	.00190959	.00075857	.00025451	.00021109	.00031860	.00001423	.00370798	.00013878	.00595778
27-M	Other manufacturing	.00021017	.00010877	.00016329	.00020948	.00035503	.00259429	.00434374	.00074619	.00182356	.00019749	.00289537	.01483029	.00014850	.00216600
28-M	Mining	.00000367	.00000167	.00024003	.00001813	.00004066	.00034516	.02321687	.00023182	.00015111	.00025175	.00003893	.00346667	.00000435	.00117698
29-M	Services	.00128373	.00061158	.00026170	.00078436	.00021156	.00138342	.00410477	.00101022	.00757342	.00496802	.00006706	.00933890	.00001642	.00479260
30-M	Wholesale & retail	.00001734	.00000824	.00000431	.00001100	.00001375	.00008074	.00007541	.00003613	.00010387	.00007801	.00000145	.00047648	.00000466	.00025612
31-M	Transp. & commun.	.00031439	.00005317	.00376749	.00586218	.00254209	.00709176	.00078118	.00837277	.00478000	.00094809	.00003357	.00445466	.00001336	.05854872
32-M	Finance, ins. & real est.	.00002222	.00000155	.00000176	.00001345	.00001207	.00019981	.00000290	.00002446	.00006122	.00001331	.00001481	.02166637	.00000708	.00019479
33-M	TVA	.00013262	.00075689	.00021754	.00332332	.00017340	.00021107	.00020898	.00036815	.00028612	.00008308	.00011863	.00044957	.00001853	.00019929
34-M	Construction	.00002300	.00000643	.00003732	.00005423	.00022470	.00195057	.00044982	.01265117	.00284347	.00019170	.00013806	.20450173	.00002048	.00284333
1-W	Livestock	.00000032	.00000006	.00000822	.00001278	.00000576	.00001513	.00000034	.00001774	.00000925	.00022226	.00000002	.00000046	.00000011	.00012718
2-W	Crops	.00002427	.00000042	.00007591	.00005476	.00012370	.00085695	.00016321	.00007575	.03694912	.00094365	.00002443	.00034382	.00000035	.00202813
3-W	Food & tobacco	.00000262	.00000051	.00006722	.00010498	.00004726	.00012350	.00000276	.00014565	.00007594	.00182838	.00000013	.00000377	.00000091	.00104442
18-W	Textile	.00000011	.00000005	.00018227	.00000063	.00000625	.00045870	.00000108	.00000019	.00000204	.00000161	.00000001	.00000082	.00000003	.00000991
19-W	Lumber	.01271779	.00000558	.00001746	.01068917	.00024410	.00390326	.00002082	.00005566	.00013200	.00002112	.00039563	.00075636	.00000806	.00600935
20-W	Furniture	1.00000000	.00000000	.00000010	.00000014	.00000047	.00003709	.00000011	.00000020	.00000015	.00000235	.00000000	.00000019	.00000001	.00000220
21-W	Paper	.02991346	1.04114570	.00448181	.00002918	.01389061	.00195706	.00070589	.00002268	.00006473	.00027487	.00000014	.00001392	.00000162	.00110047
22-W	Chemicals & plastics	.00047867	.00027846	1.00101790	.00243042	.00674999	.00216270	.00014165	.00006167	.00771486	.00060043	.00001883	.00029624	.00000325	.00362038
24-W	Primary metals	.00000439	.00000007	.00014255	1.00000730	.01016578	.00466549	.00001130	.00000211	.00001658	.00001563	.00000010	.00001413	.00000046	.00063723
25-W	Fabricated metals	.00000720	.00000396	.01388814	.00003693	1.00026000	.01331373	.00003494	.00000791	.00074286	.00006163	.00000073	.00005531	.00000205	.03777066
26-W	Machinery & transp.	.00000843	.00000097	.00045939	.00019203	.01095969	1.00764240	.00226598	.00035257	.00137153	.00327913	.00000272	.00150048	.00001561	.02001354
27-W	Other Manufacturing	.00001788	.00000386	.00863780	.00046129	.00053222	.01193593	1.00145410	.00083378	.00263654	.00775523	.00001455	.00355098	.00002022	.04496263
28-W	Mining	.00000217	.00000016	.00010890	.00000858	.00004577	.00102061	.01209351	1.00001940	.00292928	.00014336	.00000216	.00015659	.00000221	.07432863
29-W	Services	.00065988	.00000903	.00142293	.00096988	.00317597	.02230992	.00451531	.00134072	1.02554660	.01662944	.00067761	.00952535	.00000483	.05082964
30-W	Wholesale & retail	.00137552	.00001122	.03687421	.05664032	.02425529	.06770568	.00130471	.07995586	.04150618	1.00568170	.00002844	.00092947	.00001677	.57401191
31-W	Transp. & commun.	.01877897	.01269443	.02763584	.03792598	.01846468	.04269762	.01666929	.01548322	.04417209	.00605283	1.00489770	.07739387	.00446457	.03000824
32-W	Finance, ins. & real est.	.00005766	.00000860	.00004326	.00009348	.00012882	.00909406	.00005191	.00047648	.00148037	.00056045	.00067233	1.01513490	.00000776	.00444016
33-W	TVA	.00007645	.00062816	.00019188	.00282295	.00015089	.00017311	.00018040	.00024833	.00023874	.00006904	.00009600	.00034560	1.00001210	.00015670
34-W	Construction	.00001477	.00000144	.00004178	.00002473	.00059989	.01477086	.00013472	.00008657	.02139378	.00039472	.00001492	.00108392	.00003436	1.29643810

VITA

The author, Charles MacArthur Wilson, was born in McNairy County, Tennessee, on June 13, 1942. He was reared on a farm by his grandmother and attended McNairy Elementary School from 1948 to 1956. He graduated from Bethel Springs High School, Bethel Springs, Tennessee, in 1960.

The author received his Bachelor of Arts Degree from Lambuth College, Jackson, Tennessee, in 1964 with a major in Economics and a minor in Business Administration. He was the recipient of an NDEA Fellowship which enabled him to complete work on his Master of Science Degree from the University of Tennessee, Knoxville, Tennessee, in 1965. His major was Agricultural Economics. The author continued his education under the NDEA Fellowship toward completion of the Doctor of Philosophy Degree with a major in Agricultural Marketing and minors in Economic Theory and Political Science.

The author's research has resulted in his Master's thesis, "The Impact of Industrial Development on Lawrence County, Tennessee," and this doctoral dissertation, "An Interindustry Analysis of Tennessee with Emphasis on Agriculture."

While at the University of Tennessee the author was named to membership in Gamma Sigma Delta, an honorary fraternity. He is also a member of the American Agricultural Economics Association.

The author was married to Rosalind B. Robertson on December 20, 1964, at Maury City, Tennessee.