OHFOOD

An Ohio Food Industries Input-Output Model

(Version 1.2)

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Abstract

This manuscript provides the basic documentation for a sophisticated input-output model, called **OHFOOD** for Ohio food. The model is designed specifically to capture the interdependencies and linkages among various industries composing the complex economy of Ohio. The input-output model of Ohio's economy also maintains a high degree of detail on the food and agricultural sectors. The interindustry model may be used to investigate "shocks" to the economy, such as entry of new firms into the state.

This documentation provides a brief view of the importance of food and agriculture to the state's economy based on the interindustry model. The analysis indicates that the food and agricultural sectors of the state contribute approximately 12 percent of the output, 10 percent of the value added, 15 percent of the total employment, and 9 percent of total income.

Of the 5 basic sectors within the food production and distribution chain, food processing is the largest in terms of output, but the wholesaling and retailing sectors are the most significant in terms of value added. The food and agriculture sectors account for nearly 700,000 jobs in Ohio.

The **OHFOOD** model can be used to assess changes in the structure of the Ohio economy. Keeping the model updated with the latest data available is an on-going task of the Farm Income Enhancement Program and the Department of Agricultural Economics and Rural Sociology of The Ohio State University.

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OHFOOD: An Ohio Food Industries
Input-Output Model

Introduction

Measuring production in an economy can be insightful in terms of relationships among various industrial groups. A technique known as input-output modeling endeavors to account for the interdependence of production activities of many different industries comprising the economy. The interdependence captured in the model arises because each industry employs the outputs of other industries as its raw materials. In addition, its output may be used by other producers, or industries, as a factor of production.

To illustrate linkages and interdependencies, consider corn production. Some output from this production activity is input into dry and wet corn milling. The output from milling is input into cattle feeding as is some output directly from corn production. Moving closer to the consumer level, some output from the milling industry is high-fructose corn syrup (HFCS) which in turn is input into the soft drink manufacturing industry. Quantifying, or measuring, these interdependencies and linkages can reveal how much of each industry's output is consumed by other industries compared to how much is available for final consumption or net output.

The food marketing system may be viewed as consisting of five basic components which are vertically linked and interdependent, in an economic sense. The five basic components are farm inputs and machinery, farm production, food processing, food wholesaling and retailing, and finally food service. A diagram of the simplified economic linkages among these five stages is provided in Figure 1. The four elliptical shapes of the

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diagram represent final demand components for the output of the other five stages. The arrows indicate economic flows, in terms of dollars of output, from one sector which becomes input to another sector.

For each industry or sector of the economy, estimates of the amount of direct purchases per dollar of output are obtained from the interindustry model. In addition, other economic measures of interest derived for each sector of the economy from the input-output model include total employment, value added, and the total dollar value of output. Each of these economic indicators measures different yet related interdependence among the various sectors of the economy.

Another useful indicator from input-output analysis is the "multiplier." An output multiplier for a sector, for example, measures the additional value of production of all sectors of the economy necessary to satisfy an extra dollar demanded from that specific sector. Output multipliers can be the basis for analyzing the importance of each industry in terms of its overall influence on the economy.

Other multipliers include income and employment. An income multiplier is a measure of the intuitive notion that income earned by one individual or industry is spent and becomes income to a second individual or industry. In turn, the second individual spends a portion of that income so that it becomes income to yet another individual. The income multiplier relates an increment in the income of one sector to an increment of income of other sectors. In essence, when expenditures from one sector increase, the income of other sectors will increase in some multiple of the original increment.

Finally, employment multipliers are derived from output multipliers simply by converting from an output to employment base. The "total effect" multipliers indicate the number of jobs created for each $1 million expansion in demand in their industries. The employment multiplier provided herein for each sector relates an increment in the employment within that sector to an increment in employment among all other sectors. These multipliers provide information on how much additional production or number of jobs will result from an increase in demand in a specified sector. Likewise, such a multiplier will show the total decline in production or number of jobs within the economy if curtailment occurs in a given sector. All of these measures serve to describe both the linkages among sectors within the economy and the relative importance of each sector to the total economy.

Simulation of the economic impact of new firms within an industry is one of the most powerful features of an input-output model. New firms may occur either through new plants or facilities representing net additions to the industry, or by firms relocating from one region to another. The model allows the economy to be "shocked" by adding a new firm of a specific size in terms of employment and output, and to trace the influence of such an event on the entire economy, sector by sector. The ability to perform such simulation is useful information for judging priorities on economic development with a geographic area. The input-output model enables "what-if" scenarios to be analyzed in terms of tracing the effects of changes in one sector on other sectors.

An Ohio Model: OHFOOD

Sector Definition

A sophisticated input-output model of the state's economy can capture interindustry relationships and provide information on the relative and absolute importance of various sectors of the economy. **OHFOOD**, an acronym for Ohio Food, is an input-output model which includes 40 sectors defined to emphasize agriculture and food processing, food distribution, and food consumption. Many of the 40 sectors are defined based upon the aggregation of similar industries. For example, the "Nursery/Horticulture" sector of **OHFOOD** is defined to include the grass seeds industry, the greenhouse and nursery products industry, and the landscape and horticultural services industry.

The specific definition of sectors within **OHFOOD** was accomplished by maintaining a high level of detail among the agricultural production and food processing-distribution sectors, but aggregating many other non-food industries into relatively large composite sectors. The specific food and agriculture sectors of **OHFOOD** are farm input and machinery production, dairy farm products, poultry and egg production, cattle feeding, miscellaneous livestock (such as sheep and goats), swine production, food grain production, feed grain production, miscellaneous crops (such as hay and pasture, tobacco, and tree nuts), fruits and vegetables, oil bearing crops, forestry/fishing, nursery/horticulture, meat and egg processing, dairy processing, processed food and kindred products, grain milling and flour production, soft drink and liquor production, fats and oils production, food distribution, wholesaling and retailing, and finally food services (restaurants and other retail food service). **OHFOOD** is comprised of 20 sectors related

to food and agriculture and 20 which are non-food or industrial and service based. The detailed four-digit Standard Industrial Classification (SIC) definition of each sector defined within **OHFOOD** is provided in Appendix Table A-1.

Methods

The **OHFOOD** model is based on *IMPLAN*, an input-output algorithm for the national economy using non-survey based data (University of Minnesota). *IMPLAN* is based on a procedure developed by the U.S. Forest Service for estimating input-output models for the United States or subregions (Alward). Estimates of sectoral activity for final demand, final payments, industry output, and employment for the Ohio economy are based on the latest data available for 577 sectors of the United States economy. All price and output information within the model are in 1985 dollars. The technology matrix, often called a matrix of "technical coefficients," is based on 1977 relationships for the national economy. Again, these data are the latest published data available from the Bureau of Economic Analysis of the U.S. Department of Commerce at the time of this analysis. Detail of the methods of input-output modeling for an economy and the methods used for calculations of multipliers may be found in Miller and Blair.

An input-output model also may be used to identify the relative importance among various food and agriculture sectors of the economy in terms of their potential for increasing output in the general economy of Ohio. This type of analysis compares all industries or sectors based on their estimated output multipliers. The relative ranking of various sectors of the Ohio economy, in terms of influence or "ripple" effects on the rest

of the economy, was calculated using the output multipliers reported in detail in Table 5. Prior to comparison among sectors, the output multipliers provided in Table 5 for each sector were deflated by their respective diagonal element of the Leontief inverse matrix, as reported in Table 4. This procedure allows a comparison based on the influence of each sector's output expansion potential, rather than a change in final demand within the Ohio economy.

Analysis of the Ohio Economy

Basic Economic Linkages

An overview of the Ohio economy in 1985 is shown by the total output, value added, and employment for each of 40 endogenous sectors, Table 1. The total economic output for Ohio in 1985 was $320.5 billion with employment of 4,682,139. The output of food and related agricultural sectors was $39.5 billion, or about 12 percent of Ohio's total economy, Figure 2. The total output of $39.5 billion may be divided among the five basic components of the food chain, Figure 2. The largest component is food processing, accounting for nearly $12 billion of this output or some 30 percent of the total $39.5 billion food and agriculture output.

Agricultural production adds over $6 billion in output, or about 15 percent of the total output from the food and agriculture sectors of the economy. The largest component within the agricultural production sector is feed grains, accounting for nearly $1.2 billion in output. The Ohio livestock sectors combined account for $2.95 billion in output, or approximately 49 percent of the $6.1 billion total agricultural production output,

Figure 3. Crop sectors account for another 49 percent of the total output from the agricultural production sector, Figure 4.

Value added is another economic measure of interest. The total value added in the state's economy is $172.3 billion, with nearly 10 percent, or some $16.6 billion, as value added from the food and agricultural sectors, Figure 5. Of the $16.6 billion value added by food and agriculture, 34 percent is from the wholesaling and retailing sector, and another 26 percent is from the food service sector. Food processors account for another $3.1 billion value added, or about 18 percent of the total food and agriculture sectors. Agricultural producers account for another 13 percent of the value added, or some $2.0 billion. Finally, the farm input and machinery sector has value added of $1.3 billion, or 8 percent of the $16.6 billion for all of food and agriculture.

The food and agriculture component of the state's economy contributes nearly 700,000 jobs, or about 15 percent of the total, Figure 6. The wholesaling, retailing, and food service sectors account for 70 percent of this total, or over 488,000 jobs. The food processing sector accounts for nearly 60,000 jobs, or nearly 9 percent of the food and agriculture employment. Farm production accounts for over 117,000 and represents 17 percent of the total. The smallest employment sector within the food and agriculture group is farm inputs and machinery, yet this sector employs nearly 26,000 people in Ohio, Table 1.

Total food and agricultural income is approximately 9 percent of total income in the state, Figure 7. The wholesaling, retailing, and food service sectors account for about $7.6 billion of a total food and agricultural income of $13.8 billion, or about 55 percent of

the total food and agriculture sector income. Food processing sector income is about $2.8 billion while farm production income is $2.0 billion, Table 1.

Ohio livestock sectors combined account for $912 million in income, or approximately 45 percent of the $2.0 billion total income from the ag production sector, Figure 8. Dairy farms accounted for 45 percent of the total income from the livestock sector, while poultry and egg production accounted for another 13 percent. Crop sectors account for about 53 percent, or $1.1 billion, of the total income from the ag production sector, Figure 9.

Another significant aspect of the food and agricultural component of Ohio's economy is its contribution to exports. **OHFOOD** tracks exports to other states separately from exports to foreign countries. Examination of the food component of exports to other states reveals that the food service sector exports $5.9 billion, or 35 percent of the total, Figure 10. Food processors add another 31 percent, or $5.3 billion. Farm production exports $2.6 billion, or about 15 percent of the total.

Exports to foreign countries are largest for the farm inputs and machinery sector at about $63 million, or 36 cents of every export dollar from the food and agricultural component of Ohio's economy, Figure 11. Farmers and food processors combined account for 45 cents of every foreign export dollar from Ohio's food and agricultural sectors.

Food and Agriculture Economic Development Potential

Leading agricultural production sectors with the most economic influence on the remainder of Ohio's economy include feed grains, food grains, hay/sugar/nut crops, oil bearing crops, and the fruits and vegetables sector, Figure 12. For example, for each $1.00 expansion in output from the feed grains sector, the Ohio economy would gain a total output change of $1.58, a "leverage" factor of 58 percent. Similarly, each $1.00 expansion in the food grains sector results in total output change of $1.54 in Ohio's economy.

Value-added food processing sectors also were compared regarding their relative impacts on the Ohio economy. The meat and egg processing sector would create an additional $0.61 in the Ohio economy's output for each dollar of sector output expansion, Figure 13. Other leading food processing industries with substantial influence on the state's economy include the fats and oils processing sector, processed food and kindred products, dairy processing, grain milling, and beverage processing.

Industry Interdependence - Dollar Flows

Input-output models consist of three main components: the transaction flow table, the technical coefficients table, and the interdependence coefficients table. The transaction flow table shows all the transactions between the various sectors in an economy. This table can be used to produce a table of technical coefficients which indicate the amount of each input required to produce one unit of output. The

interdependence coefficients can be used to estimate the impact on the entire economy of a change in any one sector. The derivations and analysis of these tables follow.

The transactions flow table is the core of the input-output model. Information in this table is used to derive the other tables. The economy is divided into processing or production sectors, final demand sectors (household consumption and exports), and primary input sectors (labor and imports). The flow table is a matrix where each row shows the sales by the sector on the left side to each sector composing the columns of the table. Similarly, each column of the table shows the purchases by the sector of that column from each of the other sectors (comprising the rows of the table).

The Ohio transactions flow is in Table 2. An example of the interpretation of selected transaction flows recorded in Table 2 illustrates the meaning of the numbers in this table. To illustrate, the second column shows that dairy farms buy $366,730 of inputs from other dairy farms, $7.15 million worth from the hay/sugar/nut crops sector (primarily hay), $19.67 million from the feed grains sector, $539.4 million of labor, and $314.2 million of imports to produce $969.2 million in output. Imports are inputs purchased outside the region. Competitive imports are inputs purchased from sectors currently located in Ohio; non-competitive imports are inputs purchased from sectors not found in Ohio.

Interpretation of selected numbers from the second row of Table 2 shows that dairy farms' product sales are distributed as follows: $366,730 sold to other dairy farms, $802,470 to the cattle feeding sector, $9.84 million to the feed grains sector, $304.12 million to the dairy processing sector, $8.0 million to food service, and $503.2 million to exports (outside Ohio) in the final demand sectors. In general, the columns provide the

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purchases from each sector of the economy while the rows provide the amount of output sold from the individual sector to each of the other sectors of the economy.

Finally, transactions within the transaction flows table are constrained by linear fixed coefficient production functions, so that total output is equal to total input for each processing sector. In most cases, exports or imports are treated as residual amounts so that this equality constraint is satisfied. The methods of input-output analysis require the exact sum of outputs to equal inputs for all 40 sectors.

Industry Interdependence - Purchases Per Dollar of Output

The technical coefficients table is based on a fixed coefficient production function for each of the processing or production sectors. The table has estimates of the amount of input from each sector required to produce a unit of output. Technical coefficients are ratios of input from each sector to total inputs from all sectors, derived from the flow table. For example, the coefficient of labor input for dairy farms, 0.5565 (Table 3), is the ratio of $539.4 million to $969.3 million from Table 2. These coefficients are the value of input required from each sector to produce $1.00 of output in each of the other sectors. For example, to produce $1.00 in swine sector output requires about $0.04 of feed grains and $0.19 of labor. In the context of the input-output model, these technical coefficients are called the "direct" requirements for the production of a unit of output. This direct purchase of inputs from other sectors is an increase in demand for the output of the other sectors. This increase in demand, in turn, generates the "indirect" effects over several "rounds" of economic activity. That is, the direct effect generates first-round indirect

effects, which generate second-round indirect effects, etc. The direct plus all indirect effects equal the total effects shown by the interdependence coefficients.

The Interdependence Coefficients Table

Each interdependence coefficient represents the total value of input from each sector required to provide $1.00 of output to final demand for the sector of concern. Each $1.00 supplied to final demand requires more than $1.00 of total output because of the intermediate product requirements of the processing sectors. For Ohio, to provide $1.00 of dairy farm product output to final demand requires total product of $1.00065 from dairy farms and $0.02 or less from all the other sectors, Table 4. In input-output terminology, Table 4 is a Type I table; only the processing sectors are used to generate the interdependence coefficients. This means that changes in labor earnings and regional consumption resulting from output changes do not "feed back" into the determination of total requirements for regional output. Only the direct effects of a change in final demand are incorporated.

In a Type II table, the effects generated by these indirect or secondary labor-consumption effects are called induced effects. To include the "feedback" or induced effects of changes in labor earnings and regional consumption on total requirements, the technical coefficients row for labor and the technical coefficients column for regional consumption are appended to Table 3. Exports and imports are still outside the model. The Type II interdependence coefficients table then also includes a labor row and a regional consumption column. See Richardson (1972) for further discussion of Type II effects.

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An important issue in the specification of these tables is the response of other sectors to changes in demand for the output of a given sector. It is relatively easy to estimate the actual transactions among the processing, the final demand, and the primary input sectors. If final demand for a sector increases, however, it is not necessarily true that each of the processing sectors from which inputs are purchased (and regional labor in a Type II model) will expand to provide the increase in inputs demanded by the given sector. If they do not expand, the necessary inputs, such as labor, will be imported. The activity instead "leaks" out of the region. In regions where capital and labor are fully employed, much of these indirect effects and even the direct effect is likely to come through regional imports. The effects then actually impact other regions rather than the one under study.

The Impact Multipliers

Impact coefficients or multipliers are quantitative and summary measures of the total effects that a change in the final demand for a particular sector has on the output, total income, or employment of the regional economy.

The output multiplier of a particular sector measures the total change in output generated by a $1.00 change in final demand for the product of a particular sector. It is the sum of the interdependence coefficients and the total requirements for $1.00 of final demand for that sector's column of the interdependence coefficients table. For example, the output multiplier for dairy farm products of 1.1653 (Table 5) is the sum of the dairy farm products interdependence coefficients in that sector's column of Table 4.

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The income and employment multipliers are similarly defined as the ratio of the total effect (direct plus indirect) to the direct effect. The direct effect is the income (employment) generated within the sector per unit of output. For example, each $1.00 of output in dairy farm products generates about 55 cents of income; each $1 million of output generates 30 person-years of employment, Table 5.

The total effect is the column sum of the interdependence coefficients for a particular sector multiplied by the direct effect of the sector from which the inputs are purchased. It is the summation of total income (employment) generated within each sector resulting from a change in the final demand for a specified sector. For example, a $1.00 change in final demand for feed grain products generates total income of $0.6979, where the direct effect is $0.2430 and the indirect is $0.4549, Table 5. Similarly, the total employment effect of a $1 million change in final demand is about 23.8 person-years, of which about 11.0 person-years is direct effects an the remaining 12.8 person-years of employment is in indirect effects.

In Table 5, the income multiplier of 1.7003 for dairy farm products is the ratio of 0.9274 to 0.5454. It means that each $1.00 of income from dairy farms resulting from a change in final demand generates $1.7003 in total regional income. The employment multiplier of 1.3954 means that each person-year of employment within dairy farms resulting from a change in final demand generates approximately 1.4 person-years in total employment in Ohio.

Conclusions

OHFOOD is a sophisticated input-output model designed specifically to capture the interdependencies and linkages among various industries composing the complex economy of Ohio. The model is constructed so as to maintain meaningful detail on the food and agricultural sectors. The input-output model offers some descriptive information on the importance of food and agriculture to the economy of Ohio.

The documentation reported in this manuscript is intended only to provide a brief and somewhat cursory view of the importance of food and agriculture to the state's economy. Substantially more detail is available from the numbers reported in the tables. The analysis indicates that the food and agricultural sectors of the state contribute approximately 12 percent of the output, 10 percent of the value added, 15 percent of the total employment, and 9 percent of total income. Of the 5 basic sectors within the food production and distribution chain, food processing is the largest in terms of output, but the wholesaling and retailing sectors are the most significant in terms of value added. The food and agriculture sectors account for nearly 700,000 jobs in Ohio.

The OHFOOD model can be used to assess changes in the structure of the Ohio economy. Keeping the model updated with the latest information available will be an on-going task of the Farm Income Enhancement Program and the Department of Agricultural Economics and Rural Sociology of The Ohio State University.

Table 1.   Ohio Output, Value Added, Income, and Employment, by Sector, 1985

Sector	Total Output	Value Added	Income	Employment
	------------ Millions ------------			Person Years
Food and Related Agricultural Sectors				
Farm Inputs/Machinery	4,157	1,344	1,309	25,690
Farming	6,072	2,137	2,041	117,004
Dairy Farms	969	539	529	28,643
Poultry/Eggs	518	124	122	5,964
Cattle Feeding	645	118	111	5,505
Swine	650	123	115	4,831
Sheep and Goats	171	37	35	1,793
Food Grains	191	68	65	3,313
Feed Grains	1,156	309	281	12,763
Hay/Sugar/Nut Crops	140	53	51	3,812
Nursery/Horticulture	694	375	362	24,224
Vegetables/Fruits	209	103	101	12,504
Oil Bearing Crops	587	230	215	8,068
Forestry/Fishing	142	57	55	5,583
Food Processing	11,873	3,057	2,791	59,936
Meat/Egg Processing	2,144	296	291	10,007
Dairy Processing	1,761	378	374	7,012
Proc. Food/Kindred Products	4,490	1,393	1,377	29,796
Grain Milling/Flour	639	222	220	2,722
Beverage Processing	1,590	609	372	8,478
Oils/Fats	1,249	159	156	1,920
Food Wholesaling/Retailing	8,611	5,688	4,886	236,565
Food Service	8,768	4,358	2,756	251,883
Subtotal	39,481	16,584	13,782	691,078
General Manufacturing and Service Sector				
Mining	3,368	1,893	1,728	34,229
Construction	14,256	6,172	6,117	205,345
Metal Industries	27,312	11,472	11,192	241,252
Apparel/Yarn/Leather	1,888	664	656	29,755
Wood/Paper/Publishing	11,826	5,009	4,902	131,571
Chemical/Petroleum	24,133	7,501	6,883	144,945
Stone/Clay/Glass	4,746	2,306	2,261	50,115
Machinery/Equipment	18,174	8,996	8,890	208,429
Technology Industries	5,217	2,013	1,987	64,678
Motor Vehicle Equip.	24,077	8,579	8,432	144,990
Misc. Services	13,348	8,872	8,734	402,579
Transportation/Communication	14,301	8,757	8,168	211,286
Electric/Gas/Sanitary	11,159	5,270	4,402	42,597
Wholesale/Retail	23,772	15,704	13,492	491,777
Financial/Real Estate	37,607	27,112	23,189	396,963
Recreation/Amusement	1,502	733	709	49,149
Health Services	15,609	9,683	9,629	382,755
Education Services	1,702	970	965	64,312
Government/Non-profit	5,683	2,679	2,676	136,801
Others	21,380	21,380	21,380	557,534
Subtotal	281,059	155,764	146,393	3,991,061
Total	320,540	172,348	160,175	4,682,139

Note: Each sector's output, value added, income, and employment are provided through U.S. Census information. The wholesaling and retailing sector is traded as one sector for purposes of the input-output model definition, but this sector is disaggregated for purposes of Table 1. The disaggregation procedure used is to break all wholesale/retail into food and non-food wholesale/retail. The percentage of all wholesale/retail payroll and employment solely from food wholesale/retail in Ohio is estimated using data published by County Business Patterns, 1985. The percentage of payroll is used to estimate the proportion of agriculture and food outputs, value added, and income. Similarly, the percentage of employment is used to adjust employment.

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Sector	Farm Input/ Machinery	Dairy Farms	Poultry/ Eggs	Cattle Feeding	Swine	Sheep and Goats	Food Grains	Feed Grains	Hay/Sugar/ Nut Crops	Nursery/ Horticulture
Food and Related Agricultural Sectors:										
Farm Inputs/Machinery	418.20280	1.98190	1.00370	3.43451	4.11033	0.84952	7.37728	64.98357	4.40337	29.98953
Dairy Farms	0.11812	0.36673	1.72476	0.80247	4.47263	0.86910	0.25385	9.84068	0.60149	0.13887
Poultry/Eggs	0.02893	0.08983	0.42249	0.06882	0.08236	0.01475	0.98691	9.38347	0.59688	0.03402
Cattle Feeding	0.18895	0.58406	2.74691	58.20942	0.53552	0.09592	1.43652	8.44494	0.51721	0.22117
Swine	0.19158	0.59270	2.78754	0.45408	79.84551	0.09734	0.98565	5.72921	0.35403	0.22444
Sheep and Goats	0.05356	0.16618	0.78156	0.26309	1.22930	27.62309	0.73500	7.36996	0.79081	0.86294
Food Grains	0.07386	0.24217	1.17291	0.21067	0.24808	0.04684	0.58561	0.61614	0.04060	0.08379
Feed Grains	0.36848	19.67403	17.14894	24.60937	22.15965	4.91940	0.41255	6.50425	0.41592	0.30019
Hay/Sugar/Nut Crops	0.02978	7.14715	0.43489	2.52226	5.32982	1.14756	0.04812	2.23458	0.11286	0.03502
Nursery/Horticulture	4.31978	0.11002	0.51743	0.08429	0.10087	0.01807	0.05726	0.30715	1.68157	24.44791
Vegetables/Fruits	0.05159	0.16015	0.75321	0.14815	0.17481	0.02981	0.08335	0.44711	0.02945	0.06065
Oil Bearing Crops	0.14276	0.44321	2.08445	0.42868	0.50432	0.08507	0.23065	1.23733	0.08150	0.16783
Forestry/Fishing	1.43621	4.45141	20.93367	3.41048	4.08159	0.73115	2.31653	12.42704	0.81852	1.68681
Meat/Egg Processing	0.19677	0.00124	0.04236	0.00722	0.00864	0.00746	0.00017	0.00127	0.00008	0.00000
Dairy Processing	0.58126	0.02970	0.04343	0.02129	0.02548	0.00731	0.00038	0.00426	0.00031	0.01085
Proc. Food/Kindred Products	0.93153	6.00307	8.30712	4.05827	4.85684	1.36067	0.01281	0.12318	0.00766	0.06043
Grain Milling/Flour	0.41151	0.11665	0.18553	0.05634	0.06743	0.04090	0.00001	0.00036	0.00004	0.00291
Beverage Processing	0.09081	0.09078	0.13064	0.02550	0.03051	0.04012	0.00001	0.00014	0.00001	0.03332
Oils/Fats	1.30492	2.93477	15.68851	5.14620	6.15885	1.71029	0.00007	0.00088	0.00009	0.00514
Food Service	8.57159	0.04637	0.03518	0.04331	0.05183	0.01114	0.01195	0.10476	0.01372	0.05976
General Manufacturing and Service Sectors:										
Mining	31.49089	0.05970	0.20737	0.06641	0.07948	0.01784	0.23148	1.53933	0.14832	0.31363
Construction	14.68914	2.20295	1.27231	1.56345	1.87109	0.34901	1.07078	7.11556	0.63391	3.98059
Metal Industries	50.40664	1.58839	0.34684	0.63702	0.76237	0.20459	0.31107	2.65434	0.24121	0.84728
Apparel/Yarn/Leather	2.32076	0.01793	0.00992	0.01142	0.01367	1.32544	0.00411	0.05421	0.01287	0.10818
Wood/Paper/Publishing	22.55748	0.34478	0.21824	0.15937	0.19074	0.04402	0.04960	0.35237	0.03271	3.68058
Chemical/Petroleum	139.60590	8.29466	6.75623	7.78970	9.32253	2.07523	13.48211	77.95813	6.46765	22.53703
Stone/Clay/Glass	1.26698	0.47940	0.00434	0.00678	0.00811	0.00354	0.00637	0.04835	0.00413	0.32291
Machinery/Equipment	87.03049	0.17861	0.06765	0.30887	0.36965	0.07604	0.14275	0.83854	0.09265	0.86122
Technology Industries	7.61022	0.29356	0.12429	0.55522	0.66447	0.14222	0.47517	3.50052	0.30532	1.08086
Motor Vehicle Equip.	6.32141	0.29793	0.11268	0.55057	0.65891	0.14160	0.23544	1.26767	0.14253	1.38084
Misc. Services	68.33205	1.75723	0.58216	2.17903	2.60782	0.52744	2.50570	19.64314	1.62013	8.20282
Transportation/Communication	81.17614	10.09171	6.10250	7.18319	8.59667	1.93281	2.45897	16.03292	2.16315	9.00762
Electric/Gas/Sanitary	216.25490	5.07490	4.00733	4.88610	5.84756	1.27161	2.89381	33.17011	10.73612	9.78057
Wholesale/Retail	131.06360	12.05264	16.25956	15.45126	18.49170	4.39889	6.61737	51.98011	5.19182	34.70577
Financial/Real Estate	87.00235	24.35365	10.71995	24.69279	29.55174	5.55374	31.66943	163.52040	16.86829	30.43850
Recreation/Amusement	0.44171	0.00027	0.00022	0.00029	0.00034	0.00008	0.00007	0.00052	0.00006	0.02232
Health Services	0.00000	1.34828	3.54536	3.25882	3.90008	0.82581	0.00000	0.00000	0.00000	0.00000
Education Services	2.30402	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Government/Non-profit	23.93137	0.55693	0.36581	0.51381	0.61492	0.13296	0.52584	3.37409	0.60470	2.76729
Others	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Primary Input:										
Labor	1,344.37	539.43	124.31	118.36	123.01	36.82	68.17	309.10	53.03	374.73
Imports:										
Competitive	1,271.48	314.24	265.04	343.01	308.19	74.77	44.20	327.84	30.41	129.49
Non-Competitive	126.62	0.13	0.00	0.01	0.01	0.00	0.02	5.23	0.34	0.79
Total Inputs:	4,156.83	969.27	518.17	645.11	649.95	170.58	190.88	1,156.46	139.61	693.68

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Table 2. Transactions Flow for Ohio, 1985 (Continued)

Sector	Vegetables/ Fruits	Oil Bearing Crops	Forestry/ Fishing	Meat/Egg Processing	Dairy Processing	Proc. Food/ Kindred Prod.	Grain Milling Flour	Beverage Processing	Oils/Fats	Food Service
Food and Related Agricultural Sectors:										
Farm Inputs/Machinery	4.64587	12.87894	3.88630	1.03404	1.47856	24.70966	0.77652	3.18392	1.84681	4.11361
Dairy Farms	0.45284	1.27547	0.19707	0.00000	304.11900	7.72185	0.00000	0.00000	0.00000	8.04045
Poultry/Eggs	0.33620	4.01399	2.08984	73.66936	0.12168	28.14680	0.00000	0.98983	0.00072	19.21382
Cattle Feeding	0.68228	2.32728	0.52785	426.32820	116.99070	1.35407	0.00000	0.00000	0.76779	2.53252
Swine	0.68455	1.71499	0.44647	255.58590	69.95247	1.10075	0.00000	0.00000	0.62415	2.05873
Sheep and Goats	0.99517	2.87696	1.15615	48.33834	13.28767	3.82008	0.00000	0.00000	0.00000	0.08155
Food Grains	0.25063	0.29307	0.11853	0.00050	0.00014	0.16266	6.11155	0.00864	0.00053	0.00305
Feed Grains	0.90056	1.05307	0.43293	0.00000	0.00000	12.90254	10.78081	1.77282	0.00000	0.00000
Hay/Sugar/Nut Crops	0.10505	0.12284	0.05006	0.00000	0.00000	9.21840	0.00000	0.00000	0.00056	0.00000
Nursery/Horticulture	7.73678	0.14615	2.32641	0.01074	0.00000	52.14889	0.00000	0.02165	0.02364	0.06460
Vegetables/Fruits	0.49145	0.21275	0.08606	0.00000	0.00000	7.52488	0.00369	0.06656	0.00000	19.73750
Oil Bearing Crops	0.50350	19.20405	0.23816	0.00000	0.00000	35.92549	0.00000	0.00000	217.33760	0.00000
Forestry/Fishing	5.05666	5.91340	2.40007	0.02947	0.00537	0.00912	0.00000	0.00000	0.08974	0.86552
Meat/Egg Processing	0.00002	0.00041	0.02063	263.53570	0.25822	144.36560	1.89402	0.01325	61.48618	272.19680
Dairy Processing	0.00022	0.00035	0.00068	0.90741	151.41920	81.75548	16.31434	30.42542	0.43086	122.16050
Proc. Food/Kindred Products	0.00828	0.01766	0.11906	2.63141	3.16309	57.86513	2.64172	9.63209	1.58656	355.69420
Grain Milling/Flour	0.00002	0.00006	0.00220	0.04575	0.00463	8.91477	1.62198	2.39717	0.32016	2.63123
Beverage Processing	0.00001	0.00003	0.00190	0.01139	0.79685	0.87530	0.06769	6.94422	0.01196	72.05572
Oils/Fats	0.00007	0.00023	0.00104	1.27983	0.64307	164.50450	2.39139	0.42170	186.05910	30.63958
Food Service	0.02162	0.07206	0.76595	0.84475	0.77356	5.21629	0.54752	2.15440	0.51394	4.79573
General Manufacturing and Service Sectors:										
Mining	0.13364	0.40204	0.03046	0.12790	0.11512	0.85163	0.45280	0.41098	0.43376	0.33014
Construction	1.02831	4.48376	1.83978	0.97530	4.81332	11.15603	2.49562	6.20823	4.29399	22.65590
Metal Industries	0.33743	1.15681	0.26728	2.32804	6.10059	65.22041	1.16778	71.18079	4.63866	11.29220
Apparel/Yarn/Leather	0.93694	0.01946	0.83304	0.02936	0.02588	1.33567	0.81932	0.03865	0.06293	2.23133
Wood/Paper/Publishing	2.72753	0.23728	1.64203	24.25679	38.43493	232.77860	46.05176	66.43348	47.54746	102.74930
Chemical/Petroleum	7.77311	32.58973	2.99185	4.96817	6.73002	70.96023	4.67716	6.85183	9.20776	25.05700
Stone/Clay/Glass	0.01029	0.01147	0.01022	0.01743	1.76069	47.46197	0.07104	100.05280	12.06027	9.84846
Machinery/Equipment	0.11672	0.52865	0.48561	0.26636	0.20777	3.41324	0.11387	0.73142	0.21208	14.21867
Technology Industries	0.34798	1.90857	0.20331	0.22693	0.09920	1.25120	0.08754	0.33126	0.09938	0.56636
Motor Vehicle Equip.	0.22264	0.84877	0.32640	0.02265	0.02840	0.31165	0.06177	0.07413	0.09070	0.68493
Misc. Services	1.71158	9.77786	3.88576	7.89340	8.60622	83.87786	17.52491	31.50500	8.67648	178.40970
Transportation/Communication	2.53402	4.83934	2.06672	8.37710	4.74448	113.78520	21.06752	26.52416	23.03531	91.98451
Electric/Gas/Sanitary	4.30677	3.87015	1.97626	10.68950	14.22965	67.97915	10.11816	16.26228	24.42346	153.72950
Wholesale/Retail	7.32372	20.28688	3.76763	47.85823	26.18191	240.72330	22.94958	42.94992	72.03935	308.02030
Financial/Real Estate	14.83593	108.79310	6.72996	10.25672	8.95594	64.24353	6.77652	23.48609	8.79292	440.24760
Recreation/Amusement	0.00010	0.00036	5.29068	0.00970	0.01712	0.36080	0.16035	0.19656	0.03130	52.31935
Health Services	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Education Services	0.00000	0.00000	0.29728	0.00000	0.00543	0.10306	0.02961	0.03069	0.00000	0.00000
Government/Non-profit	0.34270	1.57056	0.30569	2.86179	2.68403	15.07731	1.66466	5.32762	3.57841	20.42329
Others	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Primary Input:										
Labor	102.70	229.90	57.40	295.96	377.96	1,392.87	222.18	609.21	159.00	4,357.78
Imports:										
Competitive	38.73	112.71	37.05	609.66	581.78	1,277.53	236.17	523.46	313.86	2,053.77
Non-Competitive	0.01	0.02	0.05	0.45	2.19	146.04	0.21	0.51	81.37	3.51
Total Inputs:	209.19	586.51	142.46	2,144.13	1,760.72	4,489.63	639.00	1,590.18	1,249.30	8,768.25

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Table 2. Transactions Flow for Ohio, 1985 (Continued)

Sector	Mining	Construction	Metal Industries	Apparel/Yarn/ Leather	Wood/Paper/ Publishing	Chemical/ Petroleum	Stone/Clay/ Glass	Machinery/ Equipment	Technology Industries	Motor Vehicle Equipment
Food and Related Agricultural Sectors:										
Farm Inputs/Machinery	14.94693	3.74964	143.76550	11.10534	34.78625	1,119.81800	41.85331	36.89298	27.31872	8.64633
Dairy Farms	0.00000	0.00000	0.00002	0.00032	0.00174	0.00000	0.00000	0.00000	0.00005	0.00006
Poultry/Eggs	0.00000	0.00000	0.00003	0.00029	0.00046	0.51924	0.00000	0.00000	0.00003	0.00007
Cattle Feeding	0.00006	0.00000	0.00032	0.01761	0.00268	0.09361	0.00000	0.00000	0.03387	0.00081
Swine	0.00005	0.00000	0.00024	0.01409	0.00261	0.07610	0.00000	0.00000	0.02750	0.00062
Sheep and Goats	0.00000	0.00000	0.00000	0.41408	0.02481	0.45252	0.00000	0.00000	0.00000	0.00000
Food Grains	0.00050	0.00777	0.01329	0.00075	0.00621	0.01492	0.00687	0.00536	0.00183	0.00577
Feed Grains	0.00000	0.00000	0.00004	0.00055	0.00369	0.18698	0.00000	0.00000	0.00009	0.00010
Hay/Sugar/Nut Crops	0.00000	0.00000	0.00000	0.96291	0.00043	9.99570	0.00000	0.00000	0.00001	0.00001
Nursery/Horticulture	0.34431	48.82859	0.28587	0.09538	0.53814	1.66587	0.11877	0.15525	0.06397	0.15176
Vegetables/Fruits	0.00000	0.00000	0.00001	0.00009	0.00074	0.00000	0.00000	0.00000	0.00001	0.00002
Oil Bearing Crops	0.00000	0.00000	0.00002	0.00025	0.00205	0.10139	0.00000	0.00000	0.00004	0.00005
Forestry/Fishing	0.00073	0.15385	0.15132	0.06887	1.07896	0.22598	0.17309	0.03615	0.03352	0.02160
Meat/Egg Processing	0.01083	0.00001	0.05283	1.34638	0.00004	12.25386	0.00001	0.00001	2.57750	0.13579
Dairy Processing	0.01360	0.00411	0.28856	0.02147	0.04758	2.62279	0.08140	0.07548	0.04734	0.00772
Proc. Food/Kindred Products	0.02747	0.08252	0.59356	0.08257	0.38410	3.97769	0.22149	0.18375	0.09113	0.05588
Grain Milling/Flour	0.00474	0.00182	0.08813	0.01564	0.89890	1.49721	0.05988	0.01716	0.01286	0.00218
Beverage Processing	0.01792	0.03443	0.24710	0.06137	0.30777	0.50750	0.20899	0.20187	0.11525	0.08850
Oils/Fats	0.00775	0.00622	0.24591	0.05453	0.29036	57.24713	0.05762	0.04878	0.08413	0.00748
Food Service	4.44424	2.75042	32.82808	3.02877	35.67657	41.40079	8.01932	35.51247	17.39776	36.16738
General Manufacturing and Service Sectors:										
Mining	90.65364	10.81398	119.24970	0.24476	6.94300	1,124.84900	17.19266	1.85519	0.74044	2.75700
Construction	78.79671	21.26047	161.53670	3.75733	35.91883	73.83140	25.29246	38.81853	12.64834	33.22102
Metal Industries	18.48321	193.83960	1,528.76000	6.46700	81.84683	187.09900	20.78931	487.04670	104.40030	988.33590
Apparel/Yarn/Leather	0.37597	6.08281	9.09233	55.54682	4.94559	13.90932	3.08173	4.79729	5.98675	245.23660
Wood/Paper/Publishing	6.52267	323.91810	176.28520	30.01046	483.87450	575.43300	98.73077	201.24940	90.83311	126.57430
Chemical/Petroleum	59.84952	361.11210	376.48370	39.93209	369.73870	2,306.99700	149.83760	149.75270	70.29169	121.49900
Stone/Clay/Glass	0.33871	30.46873	33.87814	0.92250	8.48473	104.58950	161.63330	72.81272	31.37414	126.07200
Machinery/Equipment	32.35769	263.18740	320.63610	4.35309	52.75779	60.02787	15.38415	812.21480	93.67064	450.36940
Technology Industries	2.33629	86.73985	79.60220	1.11386	17.33391	19.55541	4.31955	171.97420	415.77490	348.92490
Motor Vehicle Equip.	3.18182	14.55485	34.61677	0.83577	4.30631	8.67637	2.16827	47.77343	13.39941	2,113.40700
Misc. Services	53.40723	1,012.98800	372.74480	29.57909	237.93420	394.21210	73.95982	339.21200	137.84370	341.75250
Transportation/Communication	23.06709	150.86300	446.05110	20.68039	211.21460	554.47180	144.97660	163.76660	66.43783	562.47880
Electric/Gas/Sanitary	71.43068	45.35923	855.19670	20.76542	221.85040	564.93830	252.28780	200.30640	59.41466	184.89330
Wholesale/Retail	53.46546	745.40280	860.85420	58.59277	369.44390	601.60940	112.31020	630.70950	188.37700	598.12690
Financial/Real Estate	234.48350	112.35150	367.06610	37.94412	253.12520	385.61560	93.28929	269.89260	169.19970	197.32390
Recreation/Amusement	0.28244	0.05140	1.09687	0.11956	1.65872	2.37316	0.24575	1.15201	2.93994	4.33535
Health Services	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Education Services	1.83995	0.00000	5.44656	0.81701	3.11561	15.37528	0.46739	3.50337	2.02995	18.99024
Government/Non-Profit	8.47990	11.34945	74.47235	6.20574	63.84580	82.20981	18.62618	35.08808	17.47838	39.74516
Others	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Primary Input:										
Labor	1,893.35	6,172.00	11,472.12	664.39	5,008.60	7,500.57	2,306.22	8,995.86	2,012.95	8,578.96
Imports:										
Competitive	700.39	4,624.04	9,654.31	872.20	4,286.29	8,035.30	1,131.73	5,394.72	1,637.77	8,736.25
Non-Competitive	13.69	0.05	149.84	15.98	21.93	249.88	60.22	62.98	29.45	193.02
Total Inputs:	3,368.23	14,256.00	27,312.42	1,888.12	11,825.71	24,132.59	4,745.62	18,174.46	5,216.50	24,076.62

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Table 2. Transactions Flow for Ohio, 1985 (Continued)

Sector	Misc. Services	Trnsp/Comm	Electric/Gas/ Sanitary	Wholesale/ Retail	Financial/Real Estate	Recreation/ Amusement	Health Services	Education Services	Gov't/ Non-profit	Others
Food and Related Agricultural Sectors:										
Farm Input/Machinery	21.12765	6.39743	10.49798	5.85267	7.54080	0.30033	105.44650	1.66574	20.03182	0.00000
Dairy Farms	0.02862	0.00633	0.00000	0.15430	0.00000	0.04372	3.71256	0.08885	0.08511	0.00000
Poultry/Eggs	0.04856	0.02243	0.00000	0.03786	0.00000	0.21253	4.28881	0.00211	0.04256	0.00000
Cattle Feeding	0.00264	0.00107	0.00004	0.24559	0.00000	0.01395	0.34760	0.00959	0.03476	0.00000
Swine	0.00214	0.00087	0.00004	0.24902	0.00000	0.01195	0.28249	0.00522	0.02804	0.00000
Sheep and Goats	0.49096	0.00000	0.00000	0.06996	0.00000	1.02882	0.00001	0.15988	0.17821	0.00000
Food Grains	0.00211	0.02693	0.00098	0.11062	0.00251	0.00166	0.00292	0.00135	0.00454	0.00000
Feed Grains	0.14110	0.00001	0.00000	0.33344	0.00000	6.51629	0.00019	0.00609	0.00077	0.00000
Hay/Sugar/Nut Crops	0.00501	0.00000	0.00000	0.03889	0.48134	0.48724	0.27327	0.00071	0.00009	0.00000
Nursery/Horticulture	2.10855	0.37788	0.37491	30.25959	53.31358	3.76659	4.97433	3.49850	2.75451	0.00000
Vegetables/Fruits	0.00613	0.00024	0.00000	0.06735	0.00000	0.02481	0.68944	0.00100	8.63285	0.00000
Oil Bearing Crops	0.00001	0.00001	0.00000	0.18638	0.00000	0.01196	0.00009	0.00280	0.00037	0.00000
Forestry/Fishing	0.04640	0.00007	0.00000	1.88503	0.00121	0.03442	0.03945	0.00061	0.00574	0.00000
Meat/Egg Processing	0.35321	0.12321	0.01182	0.00230	0.00027	1.35996	37.94334	0.68226	3.59191	0.00000
Dairy Processing	0.14719	0.07068	0.00896	0.01269	0.00054	0.55693	25.80002	0.40373	1.39960	0.00000
Proc. Food/Kindred Products	0.58870	0.49852	0.03538	1.07867	0.04094	3.63507	52.53650	0.82956	4.33065	0.00000
Grain Milling/Flour	0.01539	0.00279	0.00322	0.00520	0.00104	0.05324	0.77706	0.00692	0.04412	0.00000
Beverage Processing	0.55997	0.11568	0.02641	1.34718	0.06360	0.30279	1.23348	0.04201	0.71191	0.00000
Oils/Fats	0.08175	0.01145	0.01419	0.02138	0.00237	0.15357	2.85530	0.00691	0.38548	0.00000
Food Service	42.33836	27.07893	3.24223	176.75060	74.62940	7.59388	45.15223	4.53066	21.70099	0.00000
General Manufacturing and Service Sectors:										
Mining	1.27237	4.09765	454.23620	4.13763	1.73610	0.13973	1.73061	0.62103	6.52630	0.00000
Construction	31.42617	301.42530	266.64680	97.19181	695.45170	22.56617	32.36106	7.45472	466.88200	0.00000
Metal Industries	25.07114	72.84945	11.66287	11.09063	2.23244	0.64753	13.38619	0.69525	4.70824	0.00000
Apparel/Yarn/Leather	14.15768	4.21079	2.15355	6.33673	3.95229	2.64286	21.83586	0.48066	10.00149	0.00000
Wood/Paper/Publishing	131.96120	48.20390	8.09003	643.50050	180.79900	26.72087	71.31449	24.71494	77.97680	0.00000
Chemical/Petroleum	130.85520	330.82080	415.78010	290.09640	60.18238	9.42642	378.16560	15.96444	73.84871	0.00000
Stone/Clay/Glass	9.29786	10.16682	0.18381	2.70421	1.00737	0.07563	11.72823	3.26870	0.37625	0.00000
Machinery/Equipment	45.51392	37.67890	25.72020	22.93051	1.75170	0.92357	5.11313	1.40112	12.28437	0.00000
Technology Industries	66.48507	97.64726	4.91652	15.43717	12.76392	0.69248	175.97340	6.79366	4.56803	0.00000
Motor Vehicle Equip.	15.26761	171.61420	27.69110	11.92875	2.55256	0.81478	3.07817	0.58328	5.43620	0.00000
Misc. Services	658.21030	364.55980	54.19765	1,146.71000	734.37940	74.83396	593.35110	50.68198	117.17180	0.00000
Transportation/Communication	224.50270	649.18600	105.88160	762.05600	211.00660	34.73070	137.38950	35.91400	137.93110	0.00000
Electric/Gas/Sanitary	165.09820	79.26855	1,465.79200	617.23190	255.94120	34.50253	226.60600	32.56109	396.54460	0.00000
Wholesale/Retail	166.06780	352.43540	72.19695	311.88350	79.35709	12.79810	186.47600	13.75832	46.89497	0.00000
Financial/Real Estate	599.55380	426.99600	115.43380	2,483.22000	4,387.14000	125.21030	1,293.46700	226.35410	354.76320	0.00000
Recreation/Amusement	9.03894	61.04989	0.37626	39.49721	0.67870	57.58875	4.53993	5.19329	6.75806	0.00000
Health Services	0.00000	0.00000	0.00000	0.00000	33.03180	2.94625	187.99150	2.42375	0.52966	0.00000
Education Services	5.73073	5.52984	5.56880	0.00000	0.20604	0.00000	0.16278	0.00000	1.40301	0.00000
Government/Non-profit	59.16230	40.67865	57.83987	146.11060	203.28030	6.55237	65.43626	11.33031	59.74171	0.00000
Others	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Primary Input:										
Labor	8,872.15	8,756.57	5,269.81	21,392.23	27,112.30	732.70	9,683.02	969.73	2,678.65	21,379.69
Imports:										
Competitive	2,008.95	2,224.90	2,779.22	4,075.75	3,384.39	326.54	2,223.17	279.65	1,112.96	0.00
Non-Competitive	31.58	221.38	0.61	69.06	97.45	1.59	0.60	0.15	38.82	0.00
Total Inputs:	13,348.07	14,300.63	11,159.35	32,383.32	37,607.32	1,501.86	15,609.08	1,702.17	5,682.51	21,379.69

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Table 2.   Transactions Flow for Ohio, 1985 (Continued)

Sector	Consumption	Investment	Governments	Domestic Exports	Foreign Exports	Total Outputs
Food and Related Agricultural Sectors:						
Farm Inputs/Machinery	76.84	532.32	56.26	648.77	626.00	4,156.83
Dairy Farms	80.29	5.30	35.35	503.02	0.20	969.27
Poultry/Eggs	74.89	0.80	4.09	289.09	3.83	518.17
Cattle Feeding	7.23	1.98	1.22	4.59	4.80	645.11
Swine	5.39	7.73	0.45	207.41	4.83	649.95
Sheep and Goats	21.35	1.50	0.20	30.14	4.13	170.58
Food Grains	0.53	0.01	0.19	88.01	91.65	190.88
Feed Grains	3.25	0.98	1.81	914.97	103.91	1,156.46
Hay/Sugar/Nut Crops	1.49	1.02	0.15	91.85	4.32	139.61
Nursery/Horticulture	106.41	9.75	28.88	294.83	6.01	693.68
Vegetables/Fruits	124.76	1.32	28.74	4.92	9.96	209.19
Oil Bearing Crops	1.60	5.89	0.59	105.60	193.91	586.51
Forestry/Fishing	8.06	0.11	0.18	61.67	1.83	142.46
Meat/Egg Processing	1,128.82	16.80	71.44	18.42	104.17	2,144.13
Dairy Processing	790.61	11.33	180.38	309.11	33.54	1,760.72
Proc. Food/Kindred Products	1,180.51	15.34	72.15	2,627.97	65.30	4,489.63
Grain Milling/Flour	47.19	0.60	0.89	532.48	37.51	639.00
Beverage Processing	154.95	2.38	1.23	1,336.28	7.94	1,590.18
Oils/Fats	172.10	2.19	6.47	468.47	119.59	1,249.30
Food Service	2,212.31	0.00	18.81	5,884.24	7.99	8,768.25
General Manufacturing and Service Sectors:						
Mining	40.40	5.34	9.95	1,194.90	230.40	3,368.23
Construction	0.00	8,921.17	2,829.65	1.35	2.65	14,256.00
Metal Industries	82.85	275.71	105.03	21,682.42	1,185.30	27,312.43
Apparel/Yarn/Leather	771.95	13.43	20.59	600.33	56.78	1,888.12
Wood/Paper/Publishing	643.38	421.82	472.05	6,141.42	229.82	11,825.71
Chemical/Petroleum	3,091.89	88.89	436.04	13,111.96	1,227.07	24,132.59
Stone/Clay/Glass	53.79	32.66	26.03	3,616.15	234.16	4,745.62
Machinery/Equipment	185.25	3,674.05	324.94	9,991.44	1,630.25	18,174.46
Technology Industries	391.11	1,308.59	362.77	1,021.48	579.72	5,216.50
Motor Vehicle Equip.	1,289.27	2,682.80	542.91	13,968.68	3,097.29	24,009.62
Misc. Services	2,321.46	7.23	683.12	2,917.33	171.37	13,348.07
Transportation/Communication	2,671.80	123.74	355.72	5,455.09	607.97	14,300.63
Electric/Gas/Sanitary	2,865.64	1.86	585.11	1,330.19	25.04	11,159.34
Wholesale/Retail	13,776.35	1,425.99	251.39	9,433.31	947.22	32,383.32
Financial/Real Estate	19,857.55	501.19	576.34	2,903.30	519.02	37,607.31
Recreation/Amusement	788.91	0.19	158.82	279.21	16.91	1,501.86
Health Services	8,871.17	0.00	108.01	6,389.53	0.57	15,609.08
Education Services	1,217.44	0.00	174.75	237.02	0.00	1,702.17
Government/Non-profit	1,015.84	9.02	153.95	3,360.26	48.59	5,682.51
Others	221.49	0.00	9,542.05	11,616.15	0.00	21,379.69

Table 3.   Technical Coefficients for Ohio, 1985

Sector	Farm Inputs/ Machinery	Dairy Farms	Poultry/ Eggs	Cattle Feeding	Swine	Sheep and Goats	Food Grains	Feed Grains	Hay/Sugar/ Nut Crops	Nursery/ Horticulture
Food and Related Agricultural Sectors:										
Farm Inputs/Machinery	0.10061	0.00204	0.00194	0.00532	0.00632	0.00498	0.03865	0.05619	0.03154	0.04323
Dairy Farms	0.00003	0.00038	0.00333	0.00124	0.00688	0.00510	0.00133	0.00851	0.00431	0.00020
Poultry/Eggs	0.00001	0.00009	0.00082	0.00011	0.00013	0.00009	0.00517	0.00811	0.00428	0.00005
Cattle Feeding	0.00005	0.00060	0.00530	0.09023	0.00082	0.00056	0.00753	0.00730	0.00370	0.00032
Swine	0.00005	0.00061	0.00538	0.00070	0.12285	0.00057	0.00516	0.00495	0.00254	0.00032
Sheep and Goats	0.00001	0.00017	0.00151	0.00041	0.00189	0.16194	0.00385	0.00637	0.00566	0.00124
Food Grains	0.00002	0.00025	0.00226	0.00033	0.00038	0.00027	0.00307	0.00053	0.00029	0.00012
Feed Grains	0.00009	0.02030	0.03310	0.03815	0.03409	0.02884	0.00216	0.00562	0.00298	0.00043
Hay/Sugar/Nut Crops	0.00001	0.00737	0.00084	0.00391	0.00820	0.00673	0.00025	0.00193	0.00081	0.00005
Nursery/Horticulture	0.00104	0.00011	0.00100	0.00013	0.00016	0.00011	0.00030	0.00027	0.01204	0.03524
Vegetables/Fruits	0.00001	0.00017	0.00145	0.00023	0.00027	0.00017	0.00044	0.00039	0.00021	0.00009
Oil Bearing Crops	0.00003	0.00046	0.00402	0.00066	0.00078	0.00050	0.00121	0.00107	0.00058	0.00024
Forestry/Fishing	0.00035	0.00459	0.04040	0.00529	0.00628	0.00429	0.01214	0.01075	0.00586	0.00243
Meat/Egg Processing	0.00005	0.00000	0.00008	0.00001	0.00001	0.00004	0.00000	0.00000	0.00000	0.00000
Dairy Processing	0.00014	0.00003	0.00008	0.00003	0.00003	0.00004	0.00000	0.00000	0.00000	0.00002
Proc. Food/Kindred Products	0.00022	0.00619	0.01603	0.00629	0.00747	0.00798	0.00007	0.00011	0.00005	0.00009
Grain Milling/Flour	0.00010	0.00012	0.00036	0.00009	0.00010	0.00024	0.00000	0.00000	0.00000	0.00000
Beverage Processing	0.00002	0.00009	0.00025	0.00004	0.00005	0.00024	0.00000	0.00000	0.00000	0.00005
Oils/Fats	0.00031	0.00303	0.03028	0.00798	0.00948	0.01003	0.00000	0.00000	0.00000	0.00001
Food Service	0.00206	0.00005	0.00007	0.00007	0.00008	0.00007	0.00006	0.00009	0.00010	0.00009
General Manufacturing and Service Sectors:										
Mining	0.00758	0.00006	0.00040	0.00010	0.00012	0.00010	0.00121	0.00133	0.00106	0.00045
Construction	0.00353	0.00227	0.00246	0.00242	0.00288	0.00205	0.00561	0.00615	0.00454	0.00574
Metal Industries	0.01213	0.00164	0.00067	0.00099	0.00117	0.00120	0.00163	0.00230	0.00173	0.00122
Apparel/Yarn/Leather	0.00056	0.00002	0.00002	0.00002	0.00002	0.00777	0.00002	0.00005	0.00009	0.00016
Wood/Paper/Publishing	0.00543	0.00036	0.00042	0.00025	0.00029	0.00026	0.00026	0.00030	0.00023	0.00531
Chemical/Petroleum	0.03358	0.00856	0.01304	0.01208	0.01434	0.01217	0.07063	0.06741	0.04633	0.03249
Stone/Clay/Glass	0.00030	0.00049	0.00001	0.00001	0.00001	0.00002	0.00003	0.00004	0.00003	0.00047
Machinery/Equipment	0.02094	0.00018	0.00013	0.00048	0.00057	0.00045	0.00075	0.00073	0.00066	0.00124
Technology Industries	0.00183	0.00030	0.00024	0.00086	0.00102	0.00083	0.00249	0.00303	0.00219	0.00156
Motor Vehicle Equip.	0.00152	0.00031	0.00022	0.00085	0.00101	0.00083	0.00123	0.00110	0.00102	0.00199
Misc. Services	0.01644	0.00181	0.00112	0.00338	0.00401	0.00309	0.01313	0.01699	0.01160	0.01183
Transportation/Communication	0.01953	0.01041	0.01178	0.01113	0.01323	0.01133	0.01288	0.01386	0.01549	0.01299
Electric/Gas/Sanitary	0.05202	0.00524	0.00773	0.00757	0.00900	0.00745	0.01516	0.02868	0.07690	0.01410
Wholesale/Retail	0.03153	0.01243	0.03138	0.02395	0.02845	0.02579	0.03467	0.04495	0.03719	0.05003
Financial/Real Estate	0.02093	0.02513	0.02069	0.03828	0.04547	0.03256	0.16592	0.14140	0.12082	0.04388
Recreation/Amusement	0.00011	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00003
Health Services	0.00000	0.00139	0.00684	0.00505	0.00600	0.00484	0.00000	0.00000	0.00000	0.00000
Education Services	0.00055	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Government/Non-profit	0.00576	0.00057	0.00071	0.00080	0.00095	0.00078	0.00275	0.00292	0.00433	0.00399
Others	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Primary Input:										
Labor	0.32341	0.55654	0.23991	0.18348	0.18926	0.21587	0.35715	0.26728	0.37981	0.54020
Imports:										
Competitive	0.30588	0.32420	0.51149	0.53170	0.47417	0.43833	0.23157	0.28349	0.21778	0.18668
Non-Competitive	0.03046	0.00013	0.00000	0.00001	0.00002	0.00001	0.00009	0.00453	0.00240	0.00114
Total Inputs:	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

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Table 3.   Technical Coefficients for Ohio, 1985 (Continued)

Sector	Vegetables/ Fruits	Oil Bearing Crops	Forestry/ Fishing	Meat/Egg Processing	Dairy Processing	Proc. Food/ Kindred Produ	Grain Milling Flour	Beverage Processing	Oils/Fats	Food Service
Food and Related Agricultural Sectors:										
Farm Inputs/Machinery	0.02221	0.02196	0.02728	0.00048	0.00084	0.00550	0.00122	0.00200	0.00148	0.00047
Dairy Farms	0.00216	0.00217	0.00138	0.00000	0.17272	0.00172	0.00000	0.00000	0.00000	0.00092
Poultry/Eggs	0.00161	0.00684	0.01467	0.03436	0.00007	0.00627	0.00000	0.00062	0.00000	0.00219
Cattle Feeding	0.00326	0.00397	0.00371	0.19884	0.06644	0.00030	0.00000	0.00000	0.00061	0.00029
Swine	0.00327	0.00292	0.00313	0.11920	0.03973	0.00025	0.00000	0.00000	0.00050	0.00023
Sheep and Goats	0.00476	0.00491	0.00812	0.02254	0.00755	0.00085	0.00000	0.00000	0.00000	0.00001
Food Grains	0.00120	0.00050	0.00083	0.00000	0.00000	0.00004	0.00956	0.00001	0.00000	0.00000
Feed Grains	0.00430	0.00180	0.00304	0.00000	0.00000	0.00287	0.01687	0.00111	0.00000	0.00000
Hay/Sugar/Nut Crops	0.00050	0.00021	0.00035	0.00000	0.00000	0.00205	0.00000	0.00000	0.00000	0.00000
Nursery/Horticulture	0.03698	0.00025	0.01633	0.00001	0.00000	0.01162	0.00000	0.00001	0.00002	0.00001
Vegetables/Fruits	0.00235	0.00036	0.00060	0.00000	0.00000	0.00168	0.00001	0.00004	0.00000	0.00225
Oil Bearing Crops	0.00241	0.03274	0.00167	0.00000	0.00000	0.00800	0.00000	0.00000	0.17397	0.00000
Forestry/Fishing	0.02417	0.01008	0.01685	0.00001	0.00000	0.00000	0.00000	0.00000	0.00007	0.00010
Meat/Egg Processing	0.00000	0.00000	0.00014	0.12291	0.00015	0.03216	0.00296	0.00001	0.04922	0.03104
Dairy Processing	0.00000	0.00000	0.00000	0.00042	0.08600	0.01821	0.02553	0.01913	0.00034	0.01393
Proc. Food/Kindred Products	0.00004	0.00003	0.00084	0.00123	0.00180	0.01289	0.00413	0.00606	0.00127	0.04057
Grain Milling/Flour	0.00000	0.00000	0.00002	0.00002	0.00000	0.00199	0.00254	0.00151	0.00026	0.00030
Beverage Processing	0.00000	0.00000	0.00001	0.00001	0.00045	0.00019	0.00011	0.00437	0.00001	0.00822
Oils/Fats	0.00000	0.00000	0.00001	0.00060	0.00037	0.03664	0.00374	0.00027	0.14893	0.00349
Food Service	0.00010	0.00012	0.00538	0.00039	0.00044	0.00116	0.00086	0.00135	0.00041	0.00055
General Manufacturing and Service Sectors:										
Mining	0.00064	0.00069	0.00021	0.00006	0.00007	0.00019	0.00071	0.00026	0.00035	0.00004
Construction	0.00492	0.00764	0.01291	0.00045	0.00273	0.00248	0.00391	0.00390	0.00344	0.00258
Metal Industries	0.00161	0.00197	0.00188	0.00109	0.00346	0.01453	0.00183	0.04476	0.00371	0.00129
Apparel/Yarn/Leather	0.00448	0.00003	0.00585	0.00001	0.00001	0.00030	0.00128	0.00002	0.00005	0.00025
Wood/Paper/Publishing	0.01304	0.00040	0.01153	0.01131	0.02183	0.05185	0.07207	0.04178	0.03806	0.01172
Chemical/Petroleum	0.03716	0.05557	0.02100	0.00232	0.00382	0.01581	0.00732	0.00431	0.00737	0.00286
Stone/Clay/Glass	0.00005	0.00002	0.00007	0.00001	0.00100	0.01057	0.00011	0.06292	0.00965	0.00112
Machinery/Equipment	0.00056	0.00090	0.00341	0.00012	0.00012	0.00076	0.00018	0.00046	0.00017	0.00162
Technology Industries	0.00166	0.00325	0.00143	0.00011	0.00006	0.00028	0.00014	0.00021	0.00008	0.00006
Motor Vehicle Equip.	0.00106	0.00145	0.00229	0.00001	0.00002	0.00007	0.00010	0.00005	0.00007	0.00008
Misc. Services	0.00818	0.01667	0.02728	0.00368	0.00489	0.01868	0.02743	0.01981	0.00695	0.02035
Transportation/Communication	0.01211	0.00825	0.01451	0.00391	0.00269	0.02534	0.03297	0.01668	0.01844	0.01049
Electric/Gas/Sanitary	0.02059	0.00660	0.01387	0.00499	0.00808	0.01514	0.01583	0.01023	0.01955	0.01753
Wholesale/Retail	0.03501	0.03459	0.02645	0.02232	0.01487	0.05362	0.03591	0.02701	0.05766	0.03513
Financial/Real Estate	0.07092	0.18549	0.04724	0.00478	0.00509	0.01431	0.01060	0.01477	0.00704	0.05021
Recreation/Amusement	0.00000	0.00000	0.03714	0.00000	0.00001	0.00008	0.00025	0.00012	0.00003	0.00597
Health Services	0.00000	0.00000	0.00000	0.00000	0.00000	0.00100	0.00000	0.00000	0.00000	0.00000
Education Services	0.00000	0.00000	0.00209	0.00000	0.00000	0.00000	0.00002	0.00005	0.00002	0.00000
Government/Non-profit	0.00164	0.00268	0.00215	0.00133	0.00152	0.00336	0.00261	0.00335	0.00286	0.00233
Others	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Primary Input:										
Labor	0.49095	0.39198	0.40293	0.13803	0.21466	0.31024	0.34769	0.38311	0.12727	0.49700
Imports:										
Competitive	0.18512	0.19218	0.26004	0.28434	0.33042	0.28455	0.36960	0.32918	0.25123	0.23423
Non-Competitive	0.00005	0.00004	0.00032	0.00021	0.00124	0.03253	0.00033	0.00032	0.06514	0.00040
Total Inputs:	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

Table 3. Technical Coefficients for Ohio, 1985 (Continued)

Sector	Mining	Construction	Metal Industries	Apparel/Yarn/ Leather	Wood/Paper/ Publishing	Chemical/ Petroleum	Stone/Clay/ Glass	Machinery/ Equipment	Technology Industries	Motor Vehicle Equipment
Food and Related Agricultural Sectors:										
Farm Inputs/Machinery	0.00444	0.00026	0.00526	0.00588	0.00294	0.04640	0.00882	0.00203	0.00524	0.00036
Dairy Farms	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Poultry/Eggs	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002	0.00000	0.00000	0.00000	0.00000
Cattle Feeding	0.00000	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00000	0.00001	0.00000
Swine	0.00000	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00000	0.00001	0.00000
Sheep and Goats	0.00000	0.00000	0.00000	0.00022	0.00000	0.00002	0.00000	0.00000	0.00000	0.00000
Food Grains	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Feed Grains	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00000
Hay/Sugar/Nut Crops	0.00000	0.00000	0.00000	0.00051	0.00000	0.00041	0.00000	0.00000	0.00000	0.00000
Nursery/Horticulture	0.00010	0.00343	0.00001	0.00005	0.00005	0.00007	0.00003	0.00001	0.00001	0.00001
Vegetables/Fruits	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Oil Bearing Crops	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Forestry/Fishing	0.00000	0.00001	0.00001	0.00004	0.00009	0.00001	0.00004	0.00000	0.00001	0.00000
Meat/Egg Processing	0.00000	0.00000	0.00000	0.00071	0.00000	0.00051	0.00000	0.00000	0.00049	0.00001
Dairy Processing	0.00000	0.00000	0.00001	0.00001	0.00000	0.00011	0.00002	0.00000	0.00001	0.00000
Proc. Food/Kindred Products	0.00001	0.00001	0.00002	0.00004	0.00003	0.00016	0.00005	0.00001	0.00002	0.00000
Grain Milling/Flour	0.00000	0.00000	0.00000	0.00001	0.00008	0.00006	0.00001	0.00000	0.00000	0.00000
Beverage Processing	0.00001	0.00000	0.00001	0.00003	0.00003	0.00002	0.00004	0.00001	0.00002	0.00000
Oils/Fats	0.00000	0.00000	0.00001	0.00003	0.00002	0.00237	0.00001	0.00000	0.00002	0.00000
Food Service	0.00132	0.00019	0.00120	0.00160	0.00302	0.00172	0.00169	0.00195	0.00334	0.00150
General Manufacturing and Service Sectors:										
Mining	0.02691	0.00076	0.00437	0.00013	0.00059	0.04661	0.00362	0.00010	0.00014	0.00011
Construction	0.02339	0.00149	0.00591	0.00199	0.00304	0.00306	0.00533	0.00214	0.00242	0.00138
Metal Industries	0.00549	0.01360	0.05597	0.00343	0.00692	0.00775	0.00438	0.02680	0.02001	0.04105
Apparel/Yarn/Leather	0.00011	0.00043	0.00033	0.02942	0.00042	0.00058	0.00065	0.00026	0.00115	0.01019
Wood/Paper/Publishing	0.00194	0.02272	0.00645	0.01589	0.04092	0.02384	0.02080	0.01107	0.01741	0.00526
Chemical/Petroleum	0.01777	0.02533	0.01378	0.02115	0.03127	0.09560	0.03157	0.00824	0.01347	0.00505
Stone/Clay/Glass	0.00010	0.00214	0.00124	0.00049	0.00072	0.00433	0.03406	0.00401	0.00601	0.00524
Machinery/Equipment	0.00961	0.01846	0.01174	0.00231	0.00446	0.00249	0.00324	0.04469	0.01796	0.01871
Technology Industries	0.00069	0.00608	0.00291	0.00059	0.00147	0.00081	0.00091	0.00946	0.07970	0.01449
Motor Vehicle Equip.	0.00094	0.00102	0.00127	0.00044	0.00036	0.00036	0.00046	0.00263	0.00257	0.08778
Misc. Services	0.01586	0.07106	0.01365	0.01567	0.02012	0.01634	0.01558	0.01866	0.02642	0.01419
Transportation/Communication	0.00685	0.01058	0.01633	0.01095	0.01786	0.02298	0.03055	0.00901	0.01274	0.02336
Electric/Gas/Sanitary	0.02121	0.00318	0.03131	0.01100	0.01876	0.02341	0.05316	0.01102	0.01139	0.00768
Wholesale/Retail	0.01587	0.05229	0.03152	0.03103	0.03124	0.02493	0.02367	0.03470	0.03611	0.02484
Financial/Real Estate	0.06962	0.00788	0.01344	0.02010	0.02140	0.01598	0.01966	0.01485	0.03244	0.00820
Recreation/Amusement	0.00008	0.00000	0.00004	0.00006	0.00014	0.00010	0.00005	0.00006	0.00056	0.00018
Health Services	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Education Services	0.00055	0.00000	0.00020	0.00043	0.00026	0.00064	0.00010	0.00019	0.00039	0.00079
Government/Non-profit	0.00252	0.00080	0.00273	0.00329	0.00540	0.00341	0.00392	0.00193	0.00335	0.00165
Others	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Primary Input:										
Labor	0.56212	0.43294	0.42003	0.35188	0.42353	0.31081	0.48597	0.49497	0.38588	0.35632
Imports:										
Competitive	0.20794	0.32436	0.35348	0.46194	0.36246	0.33296	0.23848	0.29683	0.31396	0.36285
Non-Competitive	0.00407	0.00000	0.00549	0.00846	0.00185	0.01035	0.01269	0.00347	0.00565	0.00802
Total Inputs:	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

Table 3. Technical Coefficients for Ohio, 1985 (Continued)

Sector	Misc. Services	Trnsp/Comm	Electric/Gas/ Sanitary	Wholesale/ Retail	Financial/Rea Estate	Recreation/ Amusement	Health Services	Education Services	Government/ Non-profit	Others
Food and Related Agricultural Sectors:										
Farm Inputs/Machinery	0.00158	0.00045	0.00094	0.00018	0.00020	0.00020	0.00676	0.00098	0.00353	0.00000
Dairy Farms	0.00000	0.00000	0.00000	0.00000	0.00000	0.00003	0.00024	0.00005	0.00001	0.00000
Poultry/Eggs	0.00000	0.00000	0.00000	0.00000	0.00000	0.00014	0.00027	0.00000	0.00001	0.00000
Cattle Feeding	0.00000	0.00000	0.00000	0.00001	0.00000	0.00001	0.00002	0.00001	0.00001	0.00000
Swine	0.00000	0.00000	0.00000	0.00001	0.00000	0.00001	0.00002	0.00000	0.00000	0.00000
Sheep and Goats	0.00004	0.00000	0.00000	0.00000	0.00000	0.00069	0.00000	0.00009	0.00003	0.00000
Food Grains	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Feed Grains	0.00001	0.00000	0.00000	0.00001	0.00000	0.00434	0.00000	0.00000	0.00000	0.00000
Hay/Sugar/Nut Crops	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00032	0.00002	0.00000	0.00000
Nursery/Horticulture	0.00016	0.00003	0.00003	0.00093	0.00142	0.00251	0.00032	0.00206	0.00048	0.00000
Vegetables/Fruits	0.00000	0.00000	0.00000	0.00000	0.00000	0.00002	0.00004	0.00000	0.00152	0.00000
Oil Bearing Crops	0.00000	0.00000	0.00000	0.00001	0.00000	0.00001	0.00000	0.00000	0.00000	0.00000
Forestry/Fishing	0.00000	0.00000	0.00000	0.00006	0.00000	0.00002	0.00000	0.00000	0.00000	0.00000
Meat/Egg Processing	0.00003	0.00001	0.00000	0.00000	0.00000	0.00091	0.00243	0.00040	0.00063	0.00000
Dairy Processing	0.00001	0.00000	0.00000	0.00000	0.00000	0.00037	0.00165	0.00024	0.00025	0.00000
Proc. Food/Kindred Products	0.00004	0.00003	0.00000	0.00003	0.00000	0.00242	0.00337	0.00049	0.00076	0.00000
Grain Milling/Flour	0.00000	0.00000	0.00000	0.00000	0.00000	0.00004	0.00005	0.00000	0.00001	0.00000
Beverage Processing	0.00004	0.00001	0.00000	0.00004	0.00000	0.00020	0.00008	0.00002	0.00013	0.00000
Oils/Fats	0.00001	0.00000	0.00000	0.00000	0.00000	0.00010	0.00018	0.00000	0.00007	0.00000
Food Service	0.00317	0.00189	0.00029	0.00546	0.00198	0.00506	0.00289	0.00266	0.00382	0.00000
General Manufacturing and Service Sectors:										
Mining	0.00010	0.00029	0.04070	0.00013	0.00005	0.00009	0.00011	0.00036	0.00115	0.00000
Construction	0.00235	0.02108	0.02389	0.00300	0.01849	0.01503	0.00207	0.00438	0.08216	0.00000
Metal Industries	0.00188	0.00509	0.00105	0.00034	0.00006	0.00043	0.00086	0.00041	0.00083	0.00000
Apparel/Yarn/Leather	0.00106	0.00029	0.00019	0.00020	0.00011	0.00176	0.00140	0.00028	0.00176	0.00000
Wood/Paper/Publishing	0.00989	0.00337	0.00072	0.01987	0.00481	0.01779	0.00457	0.01452	0.01372	0.00000
Chemical/Petroleum	0.00980	0.02313	0.03726	0.00896	0.00160	0.00628	0.02423	0.00938	0.01300	0.00000
Stone/Clay/Glass	0.00070	0.00071	0.00002	0.00008	0.00003	0.00005	0.00075	0.00192	0.00007	0.00000
Machinery/Equipment	0.00341	0.00263	0.00230	0.00071	0.00005	0.00061	0.00033	0.00082	0.00216	0.00000
Technology Industries	0.00498	0.00683	0.00044	0.00048	0.00034	0.00046	0.01127	0.00399	0.00080	0.00000
Motor Vehicle Equip.	0.00114	0.01200	0.00248	0.00037	0.00007	0.00054	0.00020	0.00034	0.00096	0.00000
Misc. Services	0.04931	0.02549	0.00486	0.03541	0.01953	0.04983	0.03801	0.02977	0.02062	0.00000
Transportation/Communication	0.01682	0.04540	0.00949	0.02353	0.00561	0.02313	0.00880	0.02110	0.02427	0.00000
Electric/Gas/Sanitary	0.01237	0.00554	0.13135	0.01906	0.00681	0.02297	0.01452	0.01913	0.06978	0.00000
Wholesale/Retail	0.01244	0.02464	0.00647	0.00963	0.00211	0.00852	0.01195	0.00808	0.00825	0.00000
Financial/Real Estate	0.04492	0.02986	0.01034	0.07668	0.11666	0.08337	0.08287	0.13298	0.06243	0.00000
Recreation/Amusement	0.00068	0.00427	0.00003	0.00122	0.00002	0.03834	0.00029	0.00305	0.00119	0.00000
Health Services	0.00000	0.00000	0.00000	0.00000	0.00088	0.00196	0.01204	0.00142	0.00009	0.00000
Education Services	0.00043	0.00039	0.00050	0.00000	0.00001	0.00000	0.00001	0.00000	0.00025	0.00000
Government/Non-profit	0.00443	0.00284	0.00518	0.00451	0.00541	0.00436	0.00419	0.00666	0.01051	0.00000
Others	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Primary Input:										
Labor	0.66468	0.61232	0.47223	0.66059	0.72093	0.48786	0.62035	0.56970	0.47138	1.00000
Imports:										
Competitive	0.15050	0.15558	0.24905	0.12586	0.08999	0.21742	0.14243	0.16429	0.19586	0.00000
Non-Competitive	0.00237	0.01548	0.00005	0.00213	0.00259	0.00106	0.00004	0.00009	0.00683	0.00000
Total Inputs:	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

Table 4.   Interdependence Coefficients for Ohio, 1985

Sector	Farm Inputs/ Machinery	Dairy Farms	Poultry/ Eggs	Cattle Feeding	Swine	Sheep and Goats	Food Grains	Feed Grains	Hay/Sugar/ Nut Crops	Nursery/ Horticulture
Food and Related Agricultural Sectors:										
Farm Inputs/Machinery	1.11488	0.00489	0.00775	0.01098	0.01286	0.01093	0.04859	0.06825	0.03976	0.05241
Dairy Farms	0.00008	1.00065	0.00391	0.00183	0.00833	0.00652	0.00149	0.00874	0.00445	0.00024
Poultry/Eggs	0.00004	0.00043	1.00201	0.00068	0.00075	0.00064	0.00543	0.00839	0.00443	0.00011
Cattle Feeding	0.00013	0.00101	0.00706	1.09982	0.00174	0.00143	0.00847	0.00827	0.00421	0.00041
Swine	0.00011	0.00094	0.00699	0.00132	1.14054	0.00125	0.00605	0.00585	0.00301	0.00042
Sheep and Goats	0.00004	0.00050	0.00268	0.00101	0.00309	1.19369	0.00481	0.00784	0.00691	0.00158
Food Grains	0.00002	0.00027	0.00235	0.00040	0.00048	0.00036	1.00311	0.00058	0.00032	0.00013
Feed Grains	0.00012	0.02059	0.03425	0.04239	0.03955	0.03496	0.00312	1.00692	0.00374	0.00055
Hay/Sugar/Nut Crops	0.00003	0.00746	0.00110	0.00445	0.00956	0.00821	0.00043	0.00220	1.00097	0.00009
Nursery/Horticulture	0.00136	0.00048	0.00218	0.00059	0.00077	0.00064	0.00102	0.00099	0.01299	1.03683
Vegetables/Fruits	0.00003	0.00019	0.00154	0.00029	0.00036	0.00025	0.00047	0.00043	0.00024	0.00011
Oil Bearing Crops	0.00015	0.00127	0.01102	0.00281	0.00345	0.00339	0.00145	0.00135	0.00075	0.00031
Forestry/Fishing	0.00041	0.00500	0.04186	0.00650	0.00793	0.00576	0.01281	0.01158	0.00635	0.00262
Meat/Egg Processing	0.00025	0.00048	0.00283	0.00093	0.00115	0.00131	0.00016	0.00018	0.00013	0.00009
Dairy Processing	0.00024	0.00018	0.00049	0.00022	0.00027	0.00030	0.00005	0.00006	0.00004	0.00005
Proc. Food/Kindred Products	0.00040	0.00634	0.01659	0.00713	0.00883	0.00981	0.00040	0.00057	0.00034	0.00018
Grain Milling/Flour	0.00012	0.00014	0.00041	0.00012	0.00015	0.00032	0.00002	0.00002	0.00001	0.00001
Beverage Processing	0.00006	0.00010	0.00027	0.00005	0.00007	0.00030	0.00002	0.00003	0.00002	0.00007
Oils/Fats	0.00058	0.00392	0.03663	0.01074	0.01327	0.01463	0.00068	0.00085	0.00053	0.00019
Food Service	0.00301	0.00035	0.00083	0.00061	0.00074	0.00066	0.00122	0.00133	0.00109	0.00092
General Manufacturing and Service Sectors:										
Mining	0.01410	0.00121	0.00233	0.00197	0.00237	0.00211	0.00692	0.00785	0.00844	0.00402
Construction	0.00849	0.00403	0.00564	0.00549	0.00668	0.00534	0.01202	0.01276	0.01173	0.00933
Metal Industries	0.01623	0.00236	0.00202	0.00216	0.00264	0.00267	0.00386	0.00492	0.00371	0.00308
Apparel/Yarn/Leather	0.00081	0.00010	0.00039	0.00016	0.00021	0.00969	0.00034	0.00040	0.00038	0.00036
Wood/Paper/Publishing	0.00993	0.00215	0.00558	0.00326	0.00398	0.00393	0.00569	0.00606	0.00481	0.00942
Chemical/Petroleum	0.04752	0.01336	0.02260	0.02132	0.02557	0.02289	0.08488	0.08331	0.06052	0.04270
Stone/Clay/Glass	0.00082	0.00073	0.00075	0.00037	0.00046	0.00049	0.00057	0.00060	0.00046	0.00083
Machinery/Equipment	0.02563	0.00064	0.00097	0.00130	0.00158	0.00136	0.00289	0.00341	0.00269	0.00327
Technology Industries	0.00313	0.00068	0.00095	0.00163	0.00197	0.00170	0.00352	0.00422	0.00316	0.00240
Motor Vehicle Equip.	0.00264	0.00063	0.00079	0.00146	0.00178	0.00155	0.00200	0.00197	0.00196	0.00280
Misc. Services	0.02581	0.00536	0.00858	0.00974	0.01176	0.01012	0.02474	0.02935	0.02191	0.02009
Transportation/Communication	0.02772	0.01320	0.01785	0.01673	0.02052	0.01854	0.02082	0.02286	0.02318	0.01938
Electric/Gas/Sanitary	0.07220	0.00955	0.01558	0.01520	0.01863	0.01644	0.02744	0.04471	0.09712	0.02447
Wholesale/Retail	0.04124	0.01620	0.04111	0.03258	0.03978	0.03776	0.04306	0.05473	0.04525	0.05770
Financial/Real Estate	0.03729	0.03682	0.04270	0.06239	0.07552	0.05923	0.20141	0.17644	0.15033	0.06232
Recreation/Amusement	0.00038	0.00029	0.00177	0.00039	0.00048	0.00038	0.00070	0.00068	0.00046	0.00034
Health Services	0.00004	0.00146	0.00708	0.00570	0.00704	0.00593	0.00032	0.00035	0.00025	0.00007
Education Services	0.00073	0.00004	0.00013	0.00006	0.00007	0.00006	0.00015	0.00017	0.00015	0.00010
Government/Non-profit	0.00785	0.00123	0.00196	0.00199	0.00242	0.00213	0.00515	0.00549	0.00672	0.00563
Others	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

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Table 4. Interdependence Coefficients for Ohio, 1985 (Continued)

Sector	Vegetables/ Fruits	Oil Bearing Crops	Forestry/ Fishing	Meat/Egg Processing	Dairy Processing	Proc. Food/ Kindred Prod.	Grain Milling Flour	Beverage Processing	Oils/Fats	Food Service
Food and Related Agricultural Sectors:										
Farm Inputs/Machinery	0.03076	0.02977	0.03422	0.00579	0.00395	0.00988	0.00435	0.00433	0.00963	0.00186
Dairy Farms	0.00235	0.00239	0.00163	0.00197	0.18966	0.00545	0.00506	0.00371	0.00070	0.00390
Poultry/Eggs	0.00206	0.00729	0.01506	0.03954	0.00027	0.00791	0.00037	0.00070	0.00380	0.00378
Cattle Feeding	0.00383	0.00467	0.00445	0.24995	0.08031	0.01073	0.00315	0.00166	0.01627	0.00974
Swine	0.00393	0.00359	0.00388	0.15566	0.04991	0.00680	0.00198	0.00104	0.01045	0.00615
Sheep and Goats	0.00608	0.00622	0.01004	0.03145	0.01017	0.00250	0.00056	0.00023	0.00311	0.00127
Food Grains	0.00125	0.00055	0.00090	0.00026	0.00010	0.00010	0.00963	0.00003	0.00013	0.00003
Feed Grains	0.00503	0.00269	0.00444	0.01724	0.00900	0.00411	0.01737	0.00138	0.00162	0.00101
Hay/Sugar/Nut Crops	0.00066	0.00037	0.00054	0.00257	0.00222	0.00227	0.00012	0.00007	0.00025	0.00022
Nursery/Horticulture	0.03913	0.00097	0.01766	0.00041	0.00025	0.01250	0.00020	0.00022	0.00041	0.00081
Vegetables/Fruits	1.00239	0.00041	0.00067	0.00019	0.00008	0.00174	0.00004	0.00007	0.00011	0.00235
Oil Bearing Crops	0.00265	1.03404	0.00203	0.00180	0.00075	0.01642	0.00093	0.00019	0.21151	0.00151
Forestry/Fishing	0.02503	0.01106	1.01802	0.00436	0.00182	0.00078	0.00040	0.00009	0.00262	0.00047
Meat/Egg Processing	0.00011	0.00015	0.00059	1.14078	0.00054	0.03976	0.00390	0.00038	0.06613	0.03733
Dairy Processing	0.00004	0.00005	0.00017	0.00068	1.09422	0.02034	0.02813	0.02124	0.00056	0.01630
Proc. Food/Kindred Products	0.00029	0.00036	0.00165	0.00518	0.00422	1.01363	0.00443	0.00637	0.00197	0.04152
Grain Milling/Flour	0.00001	0.00001	0.00004	0.00010	0.00010	0.00005	1.00256	0.00154	0.00032	0.00040
Beverage Processing	0.00002	0.00002	0.00009	0.00005	0.00005	0.00053	0.00024	1.00442	0.00004	0.00829
Oils/Fats	0.00040	0.00065	0.00096	0.00693	0.00281	0.04428	0.00476	0.00072	1.17567	0.00629
Food Service	0.00103	0.00126	0.00643	0.00101	0.00091	0.00217	0.00170	0.00215	0.00159	1.00127
General Manufacturing and Service Sectors:										
Mining	0.00467	0.00501	0.00310	0.00157	0.00147	0.00297	0.00275	0.00235	0.00375	0.00160
Construction	0.00945	0.01423	0.01733	0.00390	0.00550	0.00641	0.00716	0.00708	0.00993	0.00588
Metal Industries	0.00337	0.00391	0.00386	0.00261	0.00525	0.01742	0.00356	0.04910	0.00662	0.00320
Apparel/Yarn/Leather	0.00497	0.00034	0.00646	0.00038	0.00018	0.00051	0.00147	0.00020	0.00026	0.00040
Wood/Paper/Publishing	0.01776	0.00553	0.01664	0.01610	0.02684	0.06122	0.07888	0.04842	0.05169	0.01823
Chemical/Petroleum	0.04910	0.06873	0.03096	0.01427	0.01222	0.02730	0.01689	0.01269	0.03014	0.00829
Stone/Clay/Glass	0.00042	0.00049	0.00045	0.00028	0.00147	0.01187	0.00049	0.06576	0.01206	0.00237
Machinery/Equipment	0.00223	0.00263	0.00546	0.00098	0.00085	0.00223	0.00133	0.00213	0.00172	0.00236
Technology Industries	0.00254	0.00440	0.00249	0.00101	0.00062	0.00121	0.00103	0.00101	0.00161	0.00059
Motor Vehicle Equip.	0.00184	0.00214	0.00321	0.00080	0.00048	0.00087	0.00088	0.00065	0.00114	0.00050
Misc. Services	0.01730	0.02882	0.03880	0.01090	0.01027	0.02875	0.03607	0.02785	0.02159	0.02804
Transportation/Communication	0.01890	0.01551	0.02201	0.01393	0.00963	0.03456	0.03996	0.02425	0.03137	0.01626
Electric/Gas/Sanitary	0.03163	0.01633	0.02449	0.01517	0.01605	0.02716	0.02468	0.02186	0.03601	0.02545
Wholesale/Retail	0.04399	0.04291	0.03560	0.04235	0.02593	0.06706	0.04432	0.03534	0.08403	0.04294
Financial/Real Estate	0.09514	0.22861	0.07140	0.03760	0.02520	0.03609	0.02814	0.02772	0.06947	0.06771
Recreation/Amusement	0.00115	0.00061	0.03955	0.00032	0.00018	0.00041	0.00057	0.00034	0.00043	0.00639
Health Services	0.00018	0.00034	0.00035	0.00269	0.00106	0.00020	0.00007	0.00005	0.00025	0.00020
Education Services	0.00015	0.00012	0.00222	0.00005	0.00004	0.00011	0.00011	0.00013	0.00009	0.00005
Government/Non-profit	0.00345	0.00507	0.00394	0.00284	0.00265	0.00529	0.00413	0.00485	0.00580	0.00373
Others	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

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Table 4. Interdependence Coefficients for Ohio, 1985 (Continued)

Sector	Mining	Construction	Metal Industries	Apparel/Yarn/ Leather	Wood/Paper/ Publishing	Chemical/ Petroleum	Stone/Clay/ Glass	Machinery/ Equipment	Technology Industries	Motor Vehicle Equipment
Food and Related Agricultural Sectors:										
Farm Inputs/Machinery	0.00656	0.00265	0.00753	0.00840	0.00571	0.05820	0.01273	0.00349	0.00792	0.00170
Dairy Farms	0.00001	0.00001	0.00001	0.00002	0.00002	0.00004	0.00002	0.00001	0.00002	0.00001
Poultry/Eggs	0.00001	0.00001	0.00001	0.00004	0.00002	0.00007	0.00001	0.00001	0.00004	0.00001
Cattle Feeding	0.00003	0.00002	0.00003	0.00023	0.00005	0.00024	0.00004	0.00003	0.00019	0.00003
Swine	0.00002	0.00001	0.00002	0.00014	0.00003	0.00015	0.00002	0.00002	0.00012	0.00002
Sheep and Goats	0.00001	0.00001	0.00001	0.00030	0.00001	0.00006	0.00001	0.00001	0.00003	0.00001
Food Grains	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Feed Grains	0.00001	0.00001	0.00001	0.00001	0.00003	0.00001	0.00004	0.00001	0.00002	0.00001
Hay/Sugar/Nut Crops	0.00001	0.00001	0.00001	0.00054	0.00002	0.00047	0.00002	0.00001	0.00001	0.00001
Nursery/Horticulture	0.00037	0.00368	0.00014	0.00018	0.00018	0.00029	0.00017	0.00012	0.00018	0.00010
Vegetables/Fruits	0.00001	0.00001	0.00001	0.00001	0.00002	0.00002	0.00001	0.00001	0.00002	0.00001
Oil Bearing Crops	0.00002	0.00002	0.00002	0.00003	0.00003	0.00058	0.00003	0.00001	0.00002	0.00001
Forestry/Fishing	0.00001	0.00003	0.00001	0.00006	0.00011	0.00005	0.00005	0.00001	0.00002	0.00001
Meat/Egg Processing	0.00010	0.00008	0.00009	0.00095	0.00018	0.00094	0.00013	0.00012	0.00080	0.00012
Dairy Processing	0.00004	0.00003	0.00005	0.00006	0.00008	0.00020	0.00007	0.00005	0.00009	0.00004
Proc. Food/Kindred Products	0.00010	0.00007	0.00011	0.00016	0.00021	0.00033	0.00017	0.00013	0.00022	0.00011
Grain Milling/Flour	0.00000	0.00001	0.00001	0.00001	0.00008	0.00008	0.00002	0.00000	0.00001	0.00000
Beverage Processing	0.00002	0.00002	0.00003	0.00006	0.00006	0.00005	0.00007	0.00004	0.00007	0.00003
Oils/Fats	0.00009	0.00010	0.00009	0.00014	0.00017	0.00316	0.00016	0.00006	0.00012	0.00005
Food Service	0.00188	0.00109	0.00180	0.00217	0.00371	0.00268	0.00238	0.00261	0.00437	0.00226
General Manufacturing and Service Sectors:										
Mining	1.03013	0.00288	0.00758	0.00227	0.00376	0.05555	0.00894	0.00168	0.00223	0.00154
Construction	0.02728	1.00347	0.00901	0.00414	0.00597	0.00800	0.00968	0.00423	0.00555	0.00380
Metal Industries	0.00728	0.01609	1.06060	0.00461	0.00867	0.01115	0.00629	0.03066	0.02463	0.04929
Apparel/Yarn/Leather	0.00023	0.00063	0.00047	1.03041	0.00057	0.00081	0.00083	0.00042	0.00145	0.01162
Wood/Paper/Publishing	0.00485	0.02745	0.00951	0.01932	1.04552	0.03023	0.02534	0.01446	0.02286	0.00886
Chemical/Petroleum	0.02384	0.03234	0.02042	0.02723	0.03941	1.11399	0.04263	0.01300	0.02072	0.01041
Stone/Clay/Glass	0.00039	0.00263	0.00162	0.00074	0.00108	0.00521	1.03560	0.00460	0.00710	0.00634
Machinery/Equipment	0.01148	0.02049	0.01394	0.00323	0.00571	0.00557	0.00483	1.04794	0.02159	0.02290
Technology Industries	0.00143	0.00761	0.00397	0.00110	0.00223	0.00180	0.00176	0.01128	1.08748	0.01812
Motor Vehicle Equip.	0.00144	0.00164	0.00201	0.00085	0.00092	0.00124	0.00134	0.00340	0.00358	1.09692
Misc. Services	0.02340	0.08039	0.01998	0.02116	0.02683	0.02607	0.02295	0.02502	0.03621	0.02172
Transportation/Communication	0.01066	0.01639	0.02138	0.01502	0.02310	0.03173	0.03750	0.01340	0.01909	0.03058
Electric/Gas/Sanitary	0.02876	0.00945	0.04180	0.01694	0.02683	0.03864	0.06842	0.01763	0.02005	0.01485
Wholesale/Retail	0.02072	0.05821	0.03738	0.03547	0.03655	0.03485	0.03008	0.04042	0.04476	0.03319
Financial/Real Estate	0.08672	0.02170	0.02397	0.03053	0.03333	0.03403	0.03226	0.02536	0.04965	0.01870
Recreation/Amusement	0.00021	0.00023	0.00023	0.00023	0.00037	0.00037	0.00032	0.00023	0.00085	0.00044
Health Services	0.00008	0.00002	0.00002	0.00003	0.00003	0.00004	0.00003	0.00002	0.00005	0.00002
Education Services	0.00062	0.00009	0.00028	0.00050	0.00035	0.00083	0.00021	0.00026	0.00050	0.00093
Government/Non-profit	0.00371	0.00208	0.00385	0.00428	0.00663	0.00535	0.00543	0.00292	0.00490	0.00277
Others	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Table 4. Interdependence Coefficients for Ohio, 1985 (Continued)

Sector	Misc. Services	Trnsp/Comm	Electric/Gas/ Sanitary	Wholesale/ Retail	Financial/ Real Estate	Recreation/ Amusement	Health Services	Education Services	Government/ Non-profit	Others
Food and Related Agricultural Sectors:										
Farm Inputs/Machinery	0.00280	0.00234	0.00421	0.00125	0.00070	0.00172	0.00958	0.00229	0.00565	0.00000
Dairy Farms	0.00002	0.00001	0.00001	0.00003	0.00001	0.00019	0.00060	0.00012	0.00009	0.00000
Poultry/Eggs	0.00002	0.00002	0.00001	0.00003	0.00001	0.00027	0.00042	0.00004	0.00006	0.00000
Cattle Feeding	0.00005	0.00004	0.00002	0.00007	0.00003	0.00041	0.00086	0.00017	0.00025	0.00000
Swine	0.00003	0.00002	0.00001	0.00005	0.00002	0.00027	0.00054	0.00011	0.00016	0.00000
Sheep and Goats	0.00006	0.00001	0.00001	0.00002	0.00001	0.00095	0.00012	0.00014	0.00008	0.00000
Food Grains	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001	0.00000	0.00000	0.00000	0.00000
Feed Grains	0.00002	0.00003	0.00000	0.00003	0.00000	0.00462	0.00010	0.00004	0.00004	0.00000
Hay/Sugar/Nut Crops	0.00001	0.00002	0.00002	0.00001	0.00002	0.00037	0.00005	0.00001	0.00002	0.00000
Nursery/Horticulture	0.00031	0.00024	0.00022	0.00117	0.00176	0.00301	0.00060	0.00244	0.00105	0.00000
Vegetables/Fruits	0.00002	0.00001	0.00001	0.00003	0.00002	0.00005	0.00007	0.00002	0.00155	0.00000
Oil Bearing Crops	0.00002	0.00002	0.00003	0.00002	0.00001	0.00010	0.00013	0.00003	0.00005	0.00000
Forestry/Fishing	0.00001	0.00001	0.00001	0.00007	0.00001	0.00011	0.00004	0.00002	0.00006	0.00000
Meat/Egg Processing	0.00019	0.00014	0.00007	0.00025	0.00010	0.00143	0.00313	0.00063	0.00096	0.00000
Dairy Processing	0.00008	0.00006	0.00002	0.00011	0.00005	0.00059	0.00197	0.00034	0.00037	0.00000
Proc. Food/Kindred Products	0.00022	0.00017	0.00005	0.00030	0.00011	0.00284	0.00365	0.00067	0.00099	0.00000
Grain Milling/Flour	0.00001	0.00000	0.00000	0.00001	0.00000	0.00005	0.00006	0.00001	0.00002	0.00000
Beverage Processing	0.00008	0.00004	0.00001	0.00010	0.00003	0.00027	0.00012	0.00006	0.00017	0.00000
Oils/Fats	0.00008	0.00011	0.00015	0.00008	0.00003	0.00034	0.00052	0.00010	0.00022	0.00000
Food Service	0.00373	0.00255	0.00074	0.00605	0.00245	0.00596	0.00358	0.00339	0.00448	0.00000
General Manufacturing and Service Sectors:										
Mining	0.00159	0.00227	0.05087	0.00192	0.00074	0.00213	0.00261	0.00226	0.00605	0.00000
Construction	0.00513	0.02409	0.03041	0.00678	0.02215	0.01998	0.00572	0.00957	0.08798	0.00000
Metal Industries	0.00292	0.00738	0.00293	0.00118	0.00067	0.00163	0.00209	0.00136	0.00325	0.00000
Apparel/Yarn/Leather	0.00123	0.00058	0.00036	0.00032	0.00019	0.00205	0.00160	0.00043	0.00201	0.00000
Wood/Paper/Publishing	0.01249	0.00679	0.00378	0.02281	0.00692	0.02219	0.00793	0.01777	0.01885	0.00000
Chemical/Petroleum	0.01405	0.02965	0.05069	0.01373	0.00412	0.01257	0.03060	0.01446	0.02334	0.00000
Stone/Clay/Glass	0.00095	0.00116	0.00040	0.00027	0.00015	0.00033	0.00115	0.00221	0.00052	0.00000
Machinery/Equipment	0.00437	0.00427	0.00437	0.00145	0.00075	0.00176	0.00139	0.00170	0.00489	0.00000
Technology Industries	0.00607	0.00852	0.00116	0.00115	0.00083	0.00142	0.01295	0.00499	0.00212	0.00000
Motor Vehicle Equip.	0.00172	0.01402	0.00350	0.00095	0.00030	0.00126	0.00062	0.00092	0.00191	0.00000
Misc. Services	1.05590	0.03387	0.01179	0.04229	0.02600	0.06115	0.04580	0.03804	0.03360	0.00000
Transportation/Communication	0.02070	1.05136	0.01463	0.02777	0.00813	0.02917	0.01318	0.02573	0.03052	0.00000
Electric/Gas/Sanitary	0.01774	0.01057	1.15580	0.02552	0.01052	0.03190	0.02152	0.02643	0.08536	0.00000
Wholesale/Retail	0.01596	0.03039	0.01258	1.01335	0.00490	0.01426	0.01644	0.01214	0.01733	0.00000
Financial/Real Estate	0.05799	0.04282	0.02198	0.09351	1.13560	0.10729	0.10218	0.15745	0.08006	0.00000
Recreation/Amusement	0.00090	0.00477	0.00016	0.00149	0.00011	1.04012	0.00047	0.00337	0.00148	0.00000
Health Services	0.00006	0.00005	0.00002	0.00009	0.00101	0.00217	1.01229	0.00159	0.00017	0.00000
Education Services	0.00049	0.00047	0.00066	0.00006	0.00003	0.00007	0.00008	1.00006	0.00035	0.00000
Government/Non-profit	0.00548	0.00390	0.00674	0.00577	0.00652	0.00605	0.00559	0.00828	1.01220	0.00000
Others	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	1.00000

Table 5. Multipliers, Direct and Total Effect for Income and Employment, Ohio, 1985

Sector	Output Multiplier	Income			Employment		
		Direct Effect	Total Effect	Multiplier	Direct Effect	Total Effect	Multiplier
Food and Related Agricultural Sectors:							
Farm Inputs/Machinery	1.4646	0.3149	0.6250	1.9849	6.1802	14.5803	2.3592
Dairy Farms	1.1653	0.5454	0.9274	1.7003	29.5513	41.2372	1.3954
Poultry/Eggs	1.3615	0.2346	0.5431	2.3150	11.5105	22.1123	1.9211
Cattle Feeding	1.3768	0.1713	0.4376	2.5543	8.5335	16.9505	1.9864
Swine	1.4773	0.1766	0.4801	2.7176	7.4335	17.0485	2.2935
Sheep and Goats	1.4977	0.2060	0.5414	2.6276	10.5127	21.6675	2.0611
Food Grains	1.5463	0.3414	0.8356	2.4473	17.3569	31.1379	1.7940
Feed Grains	1.5947	0.2430	0.6979	2.8726	11.0362	23.8253	2.1588
Hay/Sugar/Nut Crops	1.5335	0.3652	0.9437	2.5840	27.3067	43.6393	1.5981
Nursery/Horticulture	1.3656	0.5215	1.0877	2.0857	34.9202	52.4588	1.5023
Vegetables/Fruits	1.4353	0.4831	1.3338	2.7609	59.7718	86.5086	1.4473
Oil Bearing Crops	1.5522	0.3663	0.8414	2.2970	13.7563	27.0173	1.9640
Forestry/Fishing	1.4518	0.3877	1.0515	2.7120	39.1866	60.9155	1.5545
Meat/Egg Processing	1.8337	0.1359	0.4638	3.4118	4.6671	16.2593	3.4838
Dairy Processing	1.5977	0.2124	0.5714	2.6896	3.9827	17.4813	4.3893
Proc. Food/Kindred Products	1.5353	0.3067	0.6489	2.1154	6.6366	17.2959	2.6061
Grain Milling/Flour	1.3823	0.3440	0.6061	1.7620	4.2602	12.3272	2.8936
Beverage Processing	1.3823	0.2338	0.5075	2.1709	5.3316	13.1857	2.4732
Oils/Fats	1.8748	0.1251	0.5379	4.2980	1.5371	14.0299	9.1272
Food Service	1.3787	0.3143	0.7992	2.5425	28.7267	43.4127	1.5112
General Manufacturing and Service Sectors:							
Mining	1.2925	0.5130	0.7968	1.5530	10.1624	17.9866	1.7699
Construction	1.3116	0.4291	0.7846	1.8286	14.4041	25.9051	1.7985
Metal Industries	1.2880	0.4098	0.6658	1.6248	8.8331	16.1248	1.8255
Apparel/Yarn/Leather	1.2316	0.3473	0.6413	1.8465	15.7594	24.7994	1.5736
Wood/Paper/Publishing	1.2785	0.4145	0.6920	1.6693	11.1259	19.3923	1.7430
Chemical/Petroleum	1.4731	0.2852	0.5968	2.0922	6.0062	14.4856	2.4118
Stone/Clay/Glass	1.3506	0.4765	0.7821	1.6413	10.5602	19.0466	1.8036
Machinery/Equipment	1.2637	0.4892	0.7663	1.5665	11.4682	19.7170	1.7193
Technology Industries	1.3875	0.3808	0.7383	1.9387	12.3987	23.1898	1.8703
Motor Vehicle Equipment	1.3575	0.3502	0.6101	1.7419	6.0220	13.3732	2.2207
Misc. Services	1.2335	0.6544	1.1098	1.6960	30.1601	44.0969	1.4621
Transportation/Communication	1.2827	0.5712	0.8984	1.5728	14.7746	24.6938	1.6714
Electric/Gas/Sanitary	1.3784	0.3945	0.6282	1.5924	3.8172	9.2973	2.4357
Wholesale/Retail	1.2701	0.5675	0.9696	1.7086	22.4913	34.3460	1.5271
Financial/Real Estate	1.2350	0.6166	0.8839	1.4335	10.5555	17.9246	1.6981
Recreation/Amusement	1.3810	0.4720	1.0523	2.2295	32.7255	50.8500	1.5538
Health Services	1.3104	0.6169	1.0578	1.7148	24.5213	37.5599	1.5317
Education Services	1.3394	0.5672	1.1652	2.0544	37.7823	55.0748	1.4577
Government/Non-profit	1.4283	0.4709	0.9640	2.0474	24.0741	38.3888	1.5946
Others	1.0000	1.0000	1.2531	1.2531	26.0777	33.8029	1.2962

Figure 1. Major Linkages in Food System

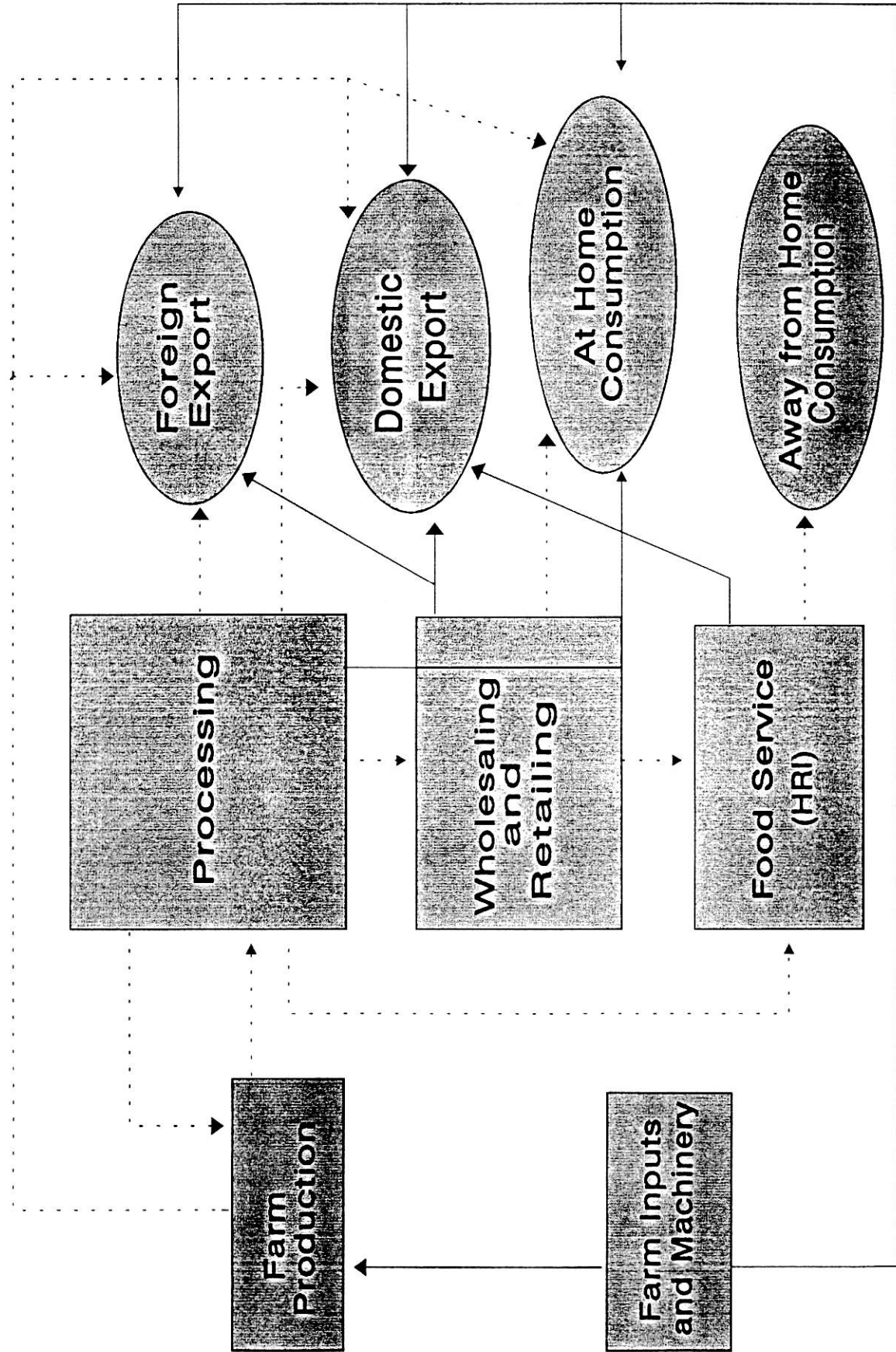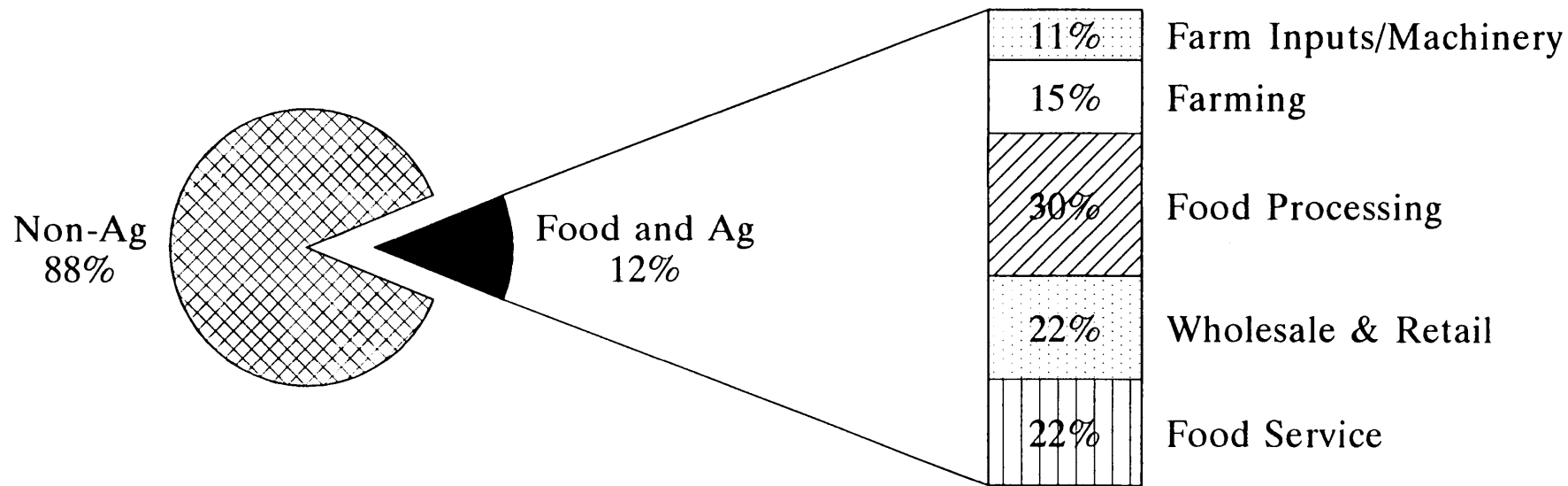## Economic Transaction Flows Among Sectors

OHFOOD 7/92

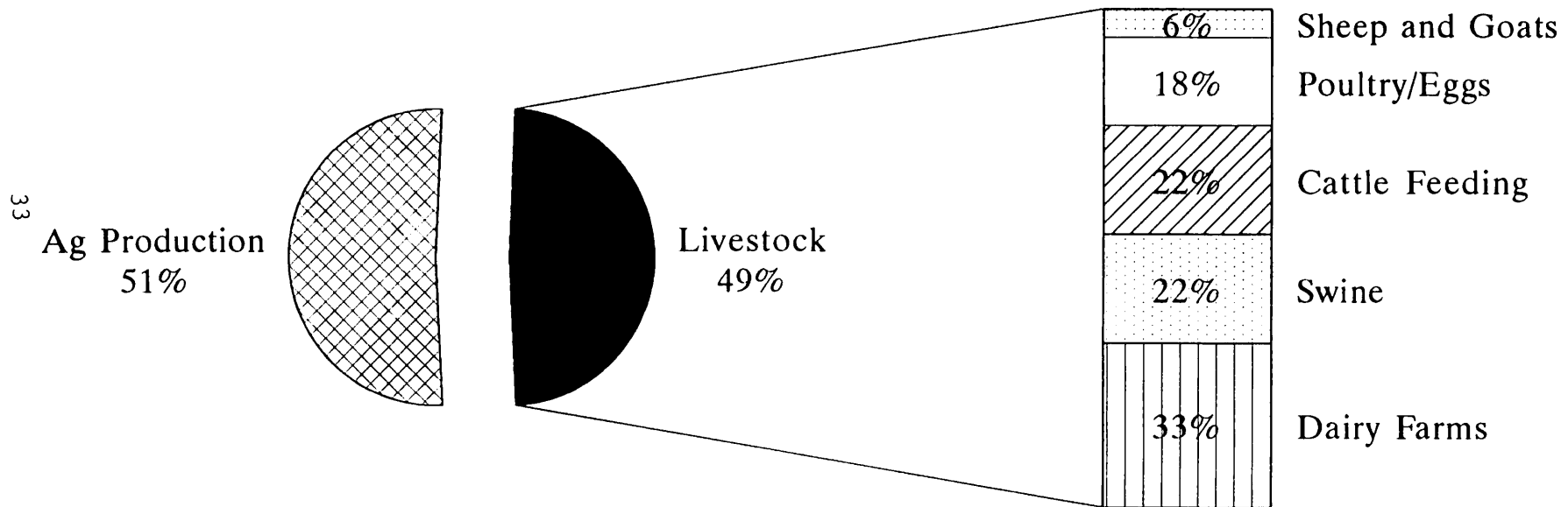# Figure 2. Ohio Economic Output
Food and Agriculture, 1985

11%	Farm Inputs/Machinery
15%	Farming
30%	Food Processing
22%	Wholesale & Retail
22%	Food Service

Non-Ag
88%

Food and Ag
12%

Total Output:
$320.5 Billion

Food & Ag Sector:
$39.5 Billion

Figure 3.   Ohio Output
Livestock Sector, 1985

Ag Production
51%

Livestock
49%

6% Sheep and Goats

18% Poultry/Eggs

22% Cattle Feeding

22% Swine

33% Dairy Farms

Total Agricultural Production:
$6.1 Billion

Livestock Sector:
$3.0 Billion

Figure 4. Ohio Output
Crop Sector, 1985

Ag Production
51%

Crops
49%

Hay/Sugar/Nut Crops — 5%
Food Grains — 6%
Vegetables/Fruits — 7%
Oil Bearing Crops — 20%
Nursery/Horticulture — 23%
Feed Grains — 39%
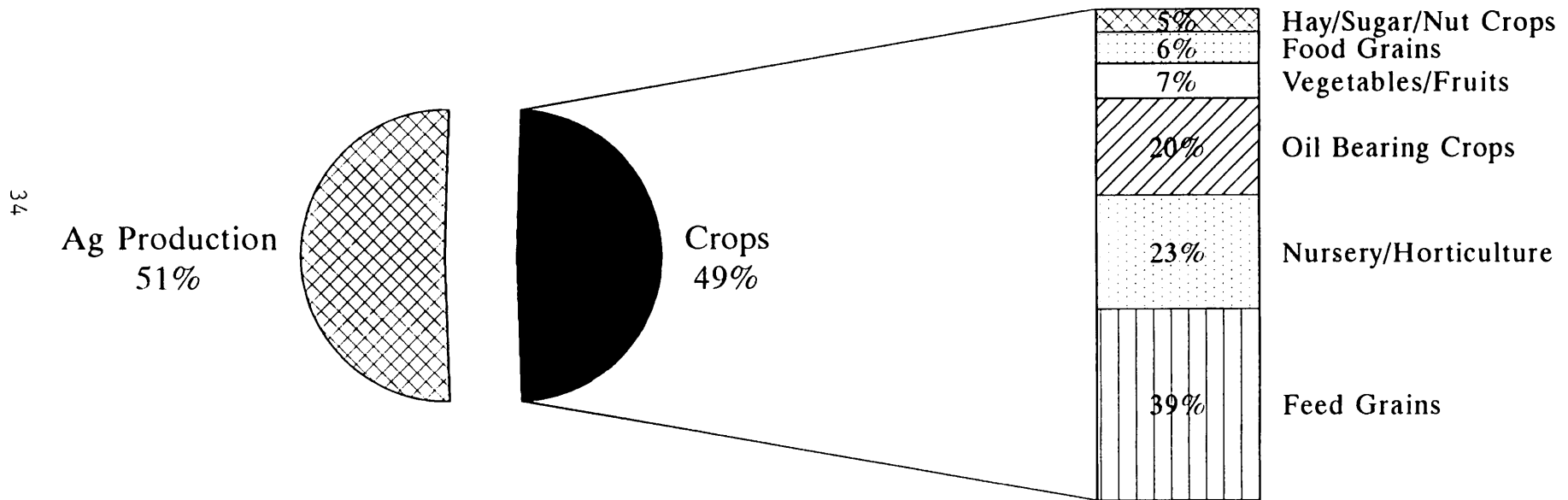
Total Agricultural Production:
$6.1 Billion

Crop Sector:
$3.0 Billion

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Figure 5. Ohio Value Added
Food and Agriculture, 1985

Farm Inputs/Machinery — 8%

Farming — 13%

Food Processing — 18%

Wholesale & Retail — 34%

Food Service — 26%

Non-Ag 90%
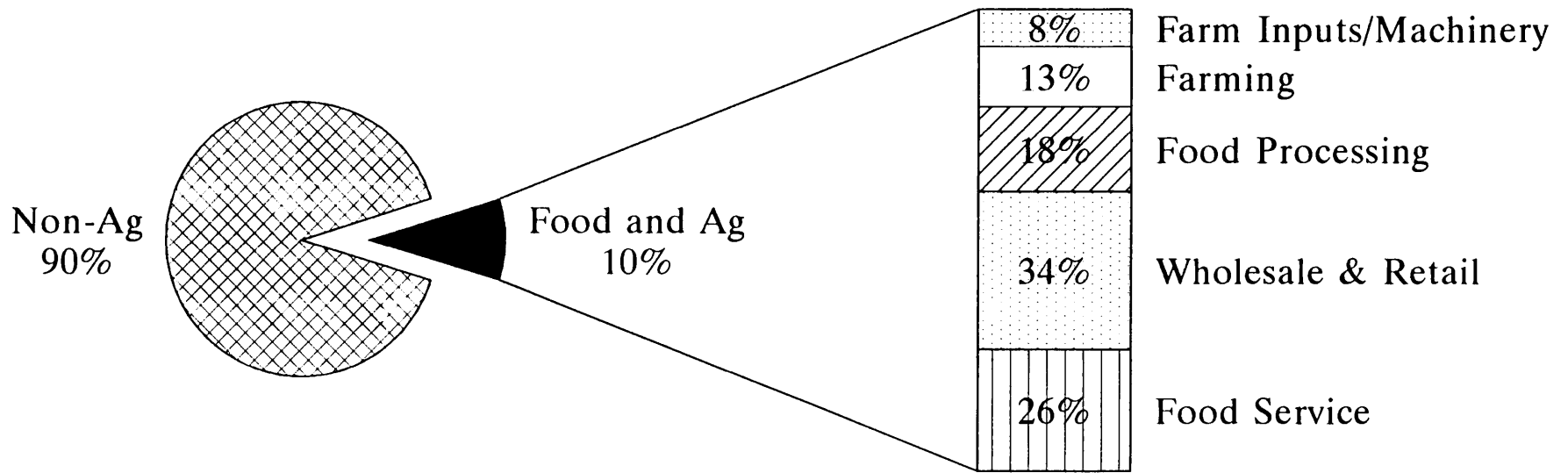
Food and Ag 10%

Total Value Added:
$172.3 Billion

Food & Ag Sector:
$16.6 Billion

35

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Figure 6. Ohio Employment Food and Agriculture, 1985

Farm Inputs/Machinery

Farming

Food Processing

Wholesale & Retail

Food Service

4%

17%

9%

34%

36%

Food and Ag
15%

Non-Ag
85%
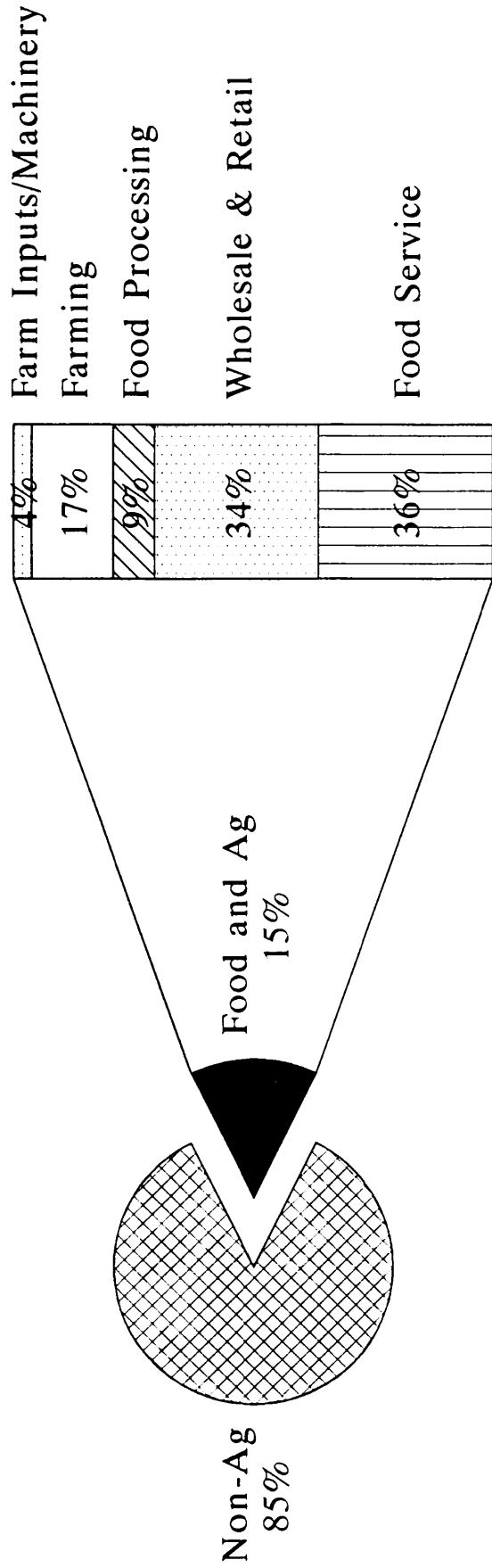
Total Employment:
4,682,000

Food & Ag Sector:
691,000

36

Figure 7. Ohio Income
Food and Agriculture, 1985

Non-Ag
91%

Food and Ag
9%

9% ⸱⸱⸱⸱ Farm Inputs/Machinery

15% Farming

20% Food Processing

35% Wholesale & Retail

20% Food Service
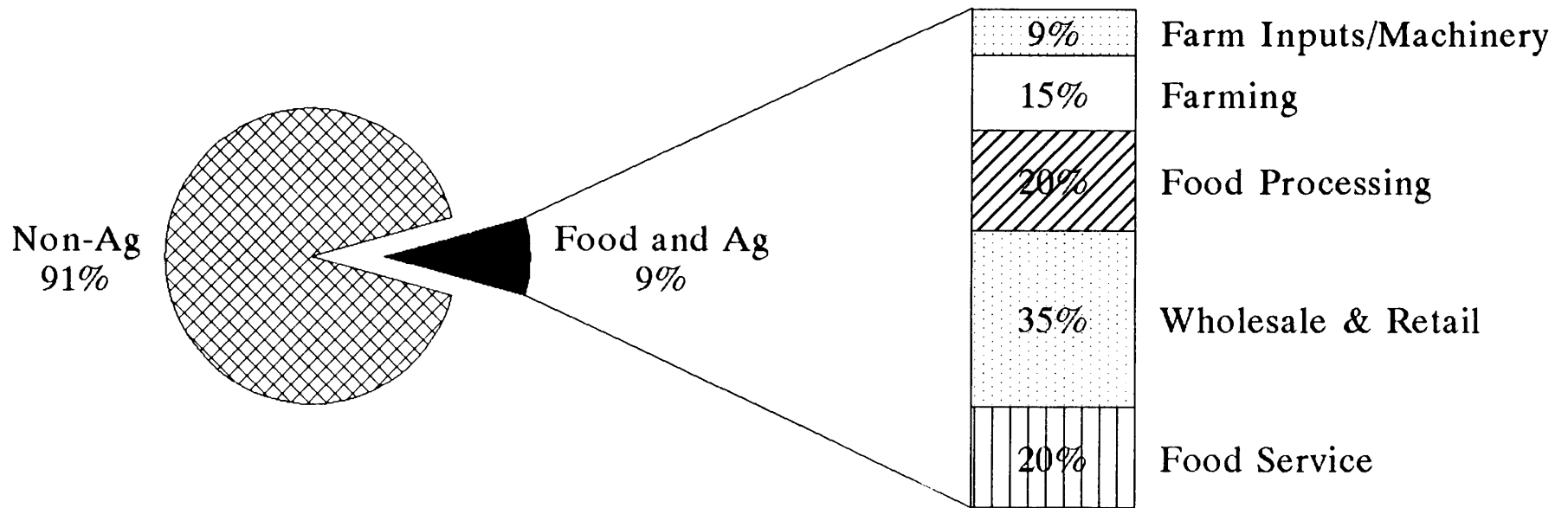
Total Income:
$160.2 Billion

Food & Ag Sector:
$13.8 Billion

Figure 8.   Ohio Income
Livestock Sector, 1985

Ag Production
55%

Livestock
45%

4%   Sheep and Goats
12%   Cattle Feeding
13%   Swine
13%   Poultry and Eggs

58%   Dairy Farms
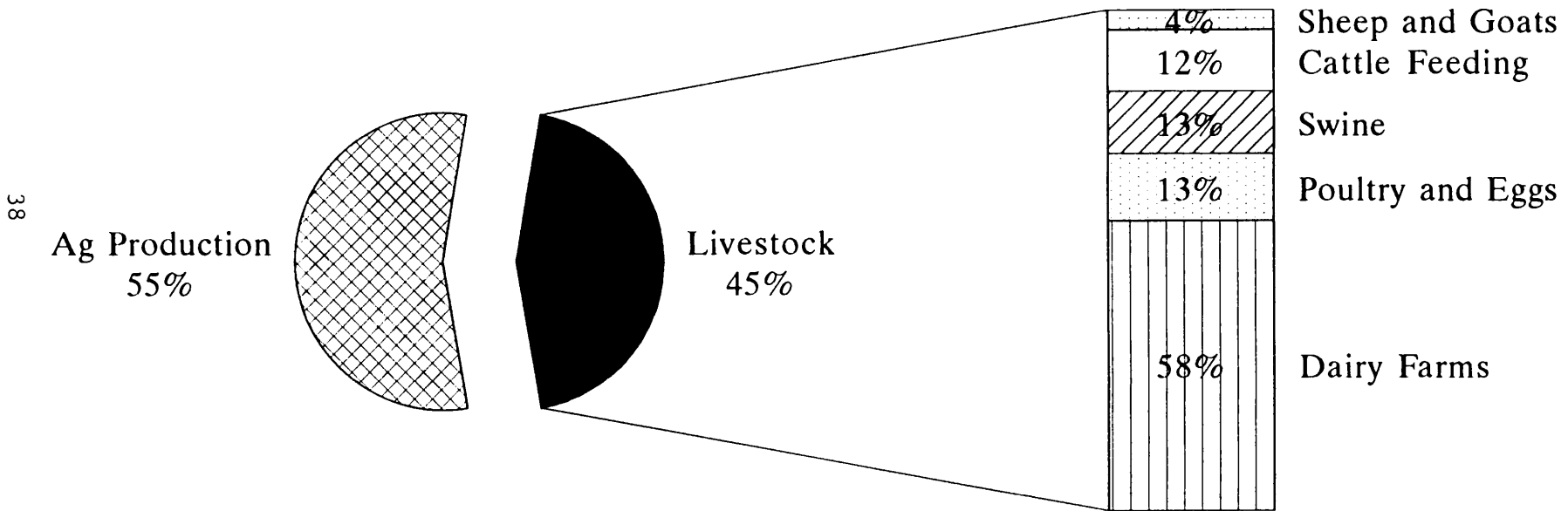
Total Agricultural Production:
$2.0 Billion

Livestock Sector:
$912 Million

Figure 9. Ohio Income
Crop Sector, 1985

Hay/Sugar/Nut Crops
Food Grains
Vegetables/Fruits
Oil Bearing Crops
Feed Grains
Nursery/Horticulture

5%
6%
9%
20%
26%
34%

Crops
53%

Ag Production
47%

Crop Sector:
$1.1 Billion

Total Agricultural Production:
$2.0 Billion

o9pai/ohfood 7f?2
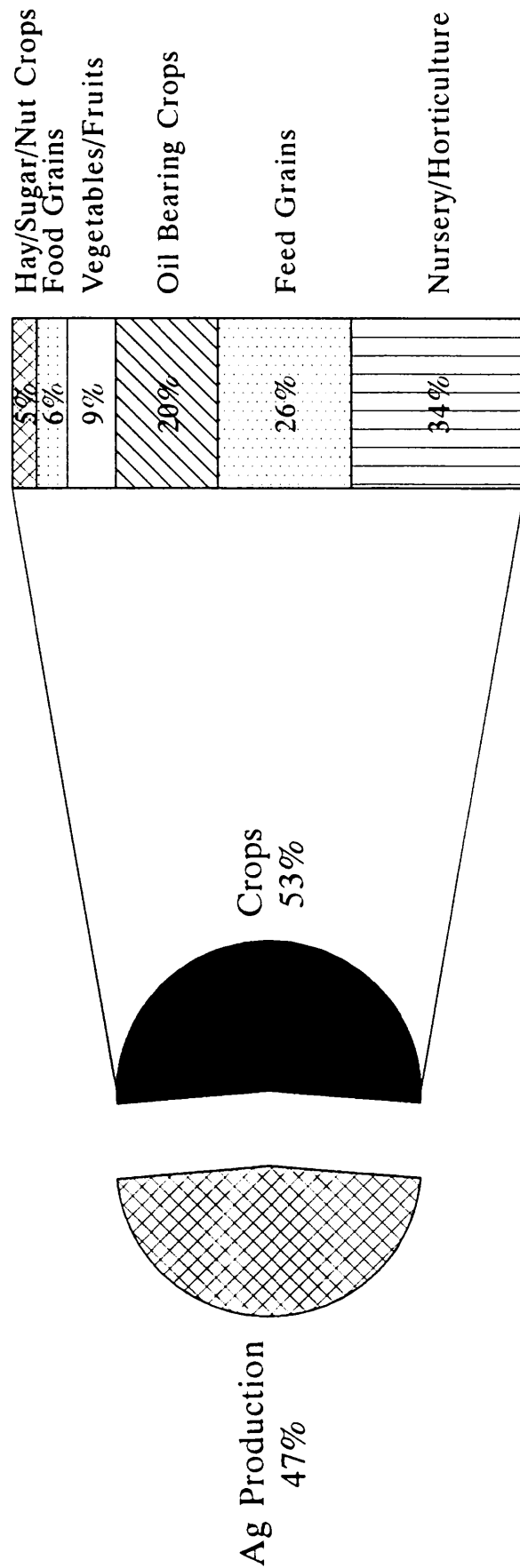
Figure 10. Exports to Other States Ohio Food and Agriculture, 1985

Farming
$2.6

Farm Inputs/Machinery
$0.65

Food Service
$5.88

Food Processing
$5.29

Wholesale & Retailing
$2.51

15%

4%

35%

31%

15%

$ Billion

40
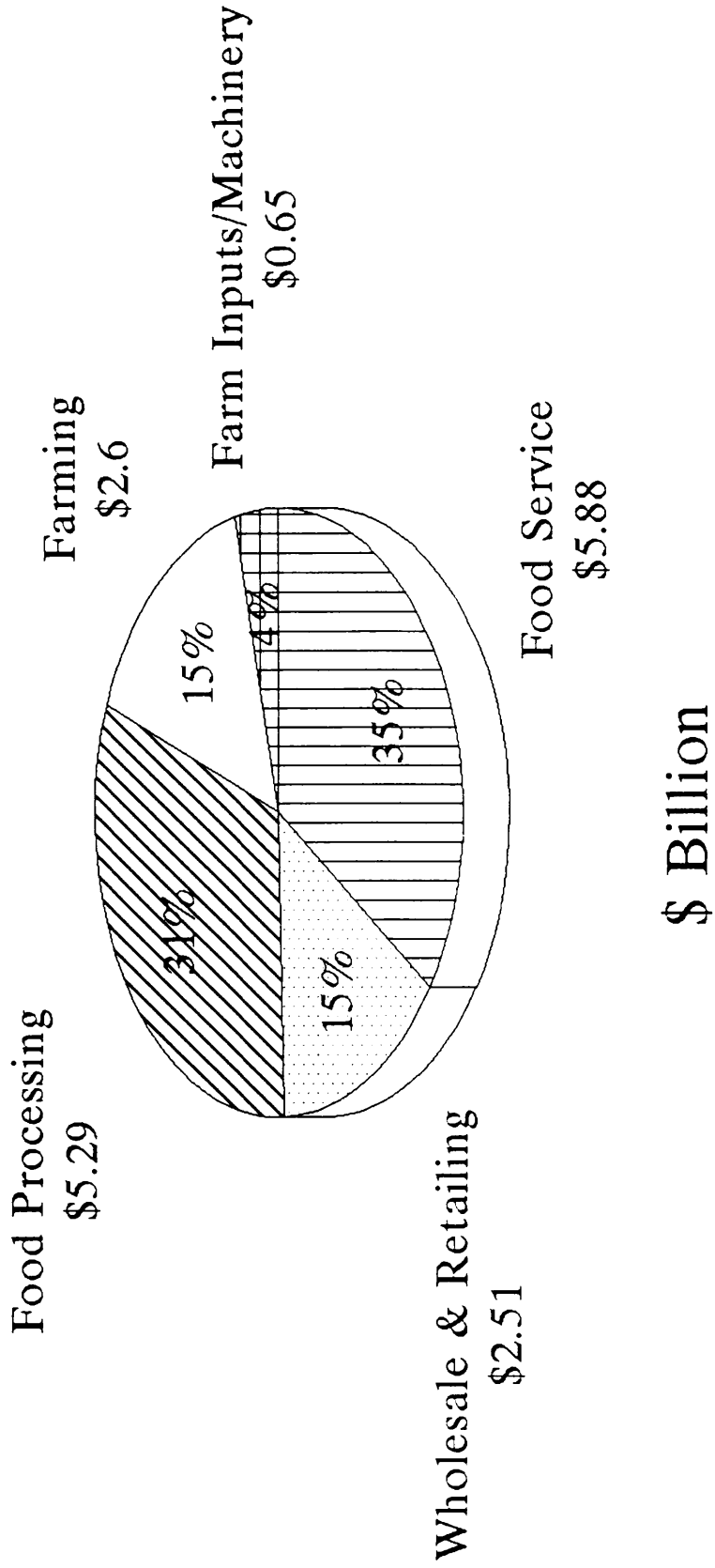
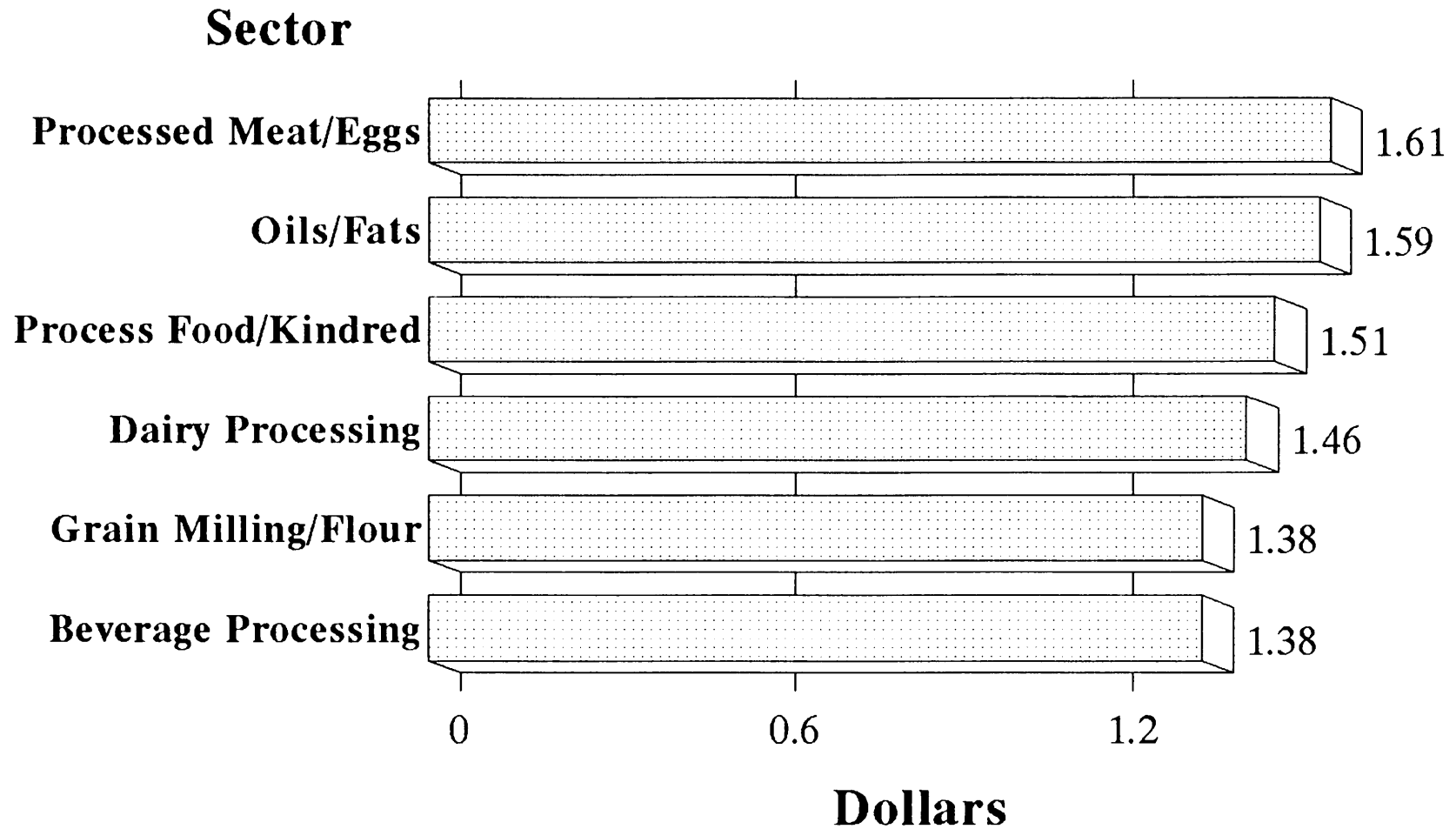# Figure 11. Foreign Export Shares Ohio Food and Agriculture, 1985

Farm Inputs/Machinery
$0.63

Food Service
$0.08

Wholesale & Retailing
$0.25

36%

5%

14%

24%

21%

Farming
$0.43

Food Processing
$0.37

$ Billion
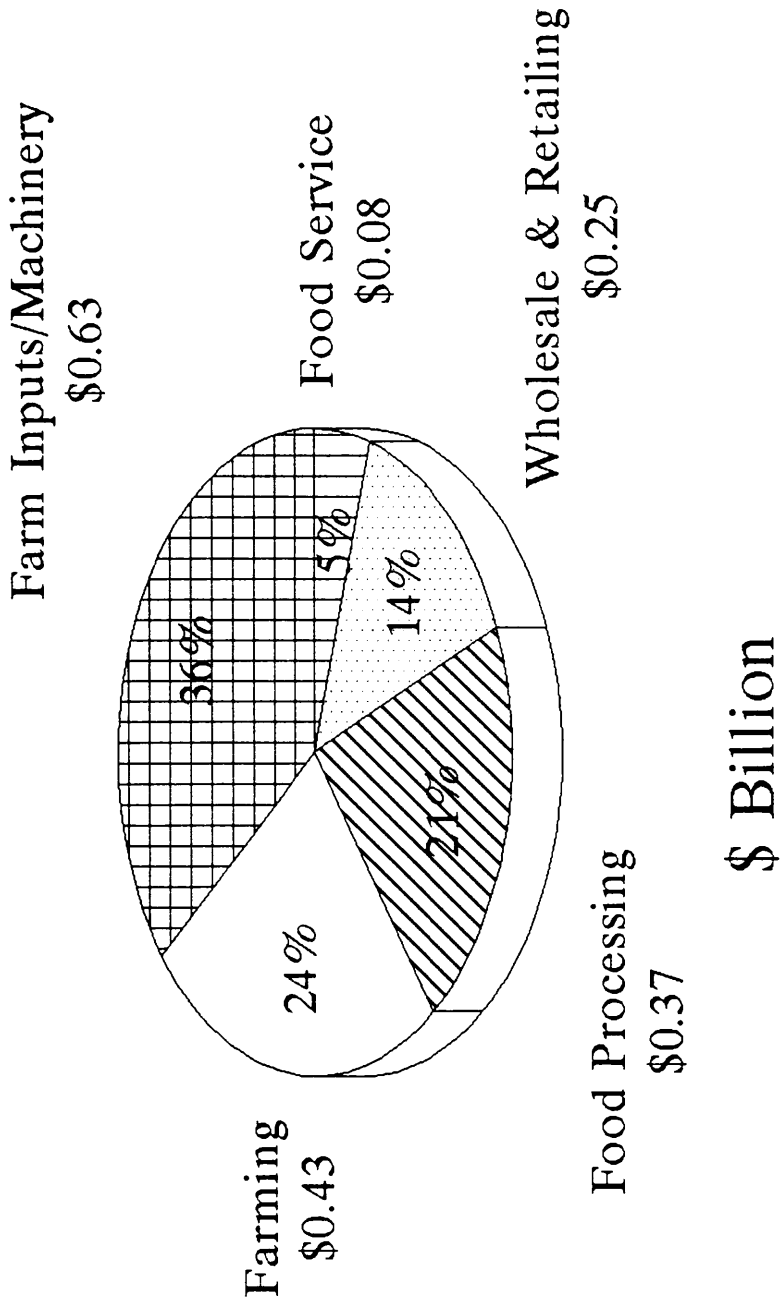
Figure 12. Top Five Ag Production Sectors
Impact on Ohio for Each $1 Change in Output

Sector

Sector	Dollars
Feed Grains	1.58
Food Grains	1.54
Hay/Sugar/Nut Crops	1.53
Oil Bearing Crops	1.5
Vegetables/Fruits	1.43

Dollars
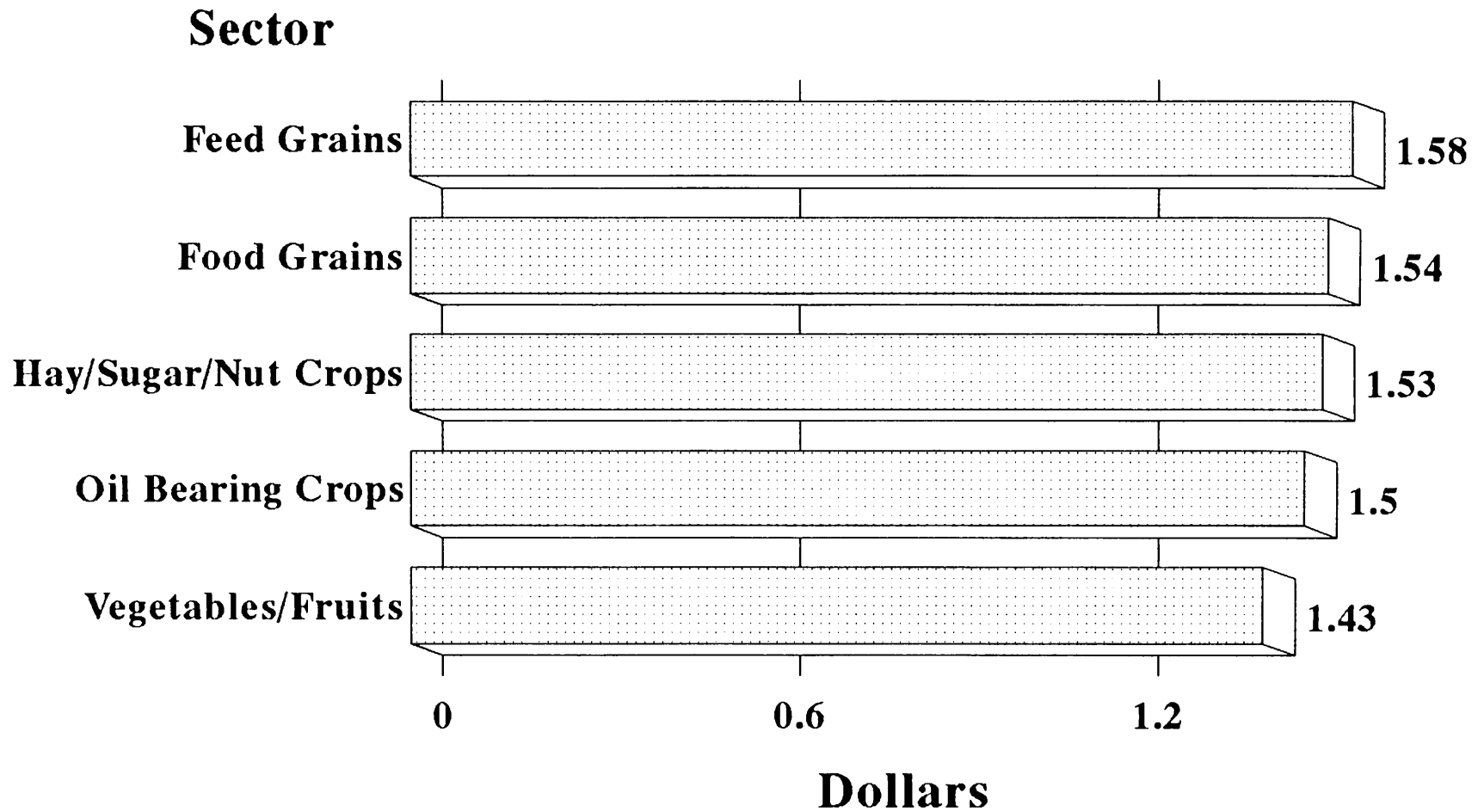
42

Figure 13. Top Six Food Processing Sectors
Impact on Ohio for Each $1 Change in Output

Sector

Sector	Dollars
Processed Meat/Eggs	1.61
Oils/Fats	1.59
Process Food/Kindred	1.51
Dairy Processing	1.46
Grain Milling/Flour	1.38
Beverage Processing	1.38

Dollars

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Miller, R. and P. Blair. *Input-Output Analysis: Foundations and Extensions.* Englewood, New Jersey: Prentice-Hall, Inc. 1985

Richardson, H.W. 1972. *Input-Output and Regional Economics.* New York: Halstead.

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University of Minnesota. *IMPLAN Software Manual.* St. Paul, Minnesota, 1989.

Table A-1. OHFOOD: Ohio Input-Output Model Endogenous Sector Definitions

Sector Name	Standard Industrial Classification (SIC)

<u>Food and Related Agriculture Sectors</u>

1. Farm Inputs/Machinery — Industrial Inorganic; Nitro. Fertilizer; Agricultural Chemicals; Farm Machinery ....
(2810, 2865, 2869, 2873, 2874, 2875, 2879, 3523, 3524, 3535, 3551, part of 2819)

2. Dairy Farms — 0241; part of 0191, 0259, and 0291

3. Poultry and Egg — 0251; 0252; 0253; part of 0191, 0219, 0259, and 0291

4. Cattle Feeding — Ranch Fed Cattle; Range Fed Cattle; Cattle Feedlots.
(0211; part of 0191, 0212, 0219, 0259, and 0291)

5. Swine — 0213; part of 0191, 0219, 0259, and 0291

6. Other Livestock — Sheep, Lambs and Goats; Other Meat Animal Products; Misc. Livestock.
(0214; 0271; 0272; part of 0191, 0219, 0259, and 0291)

7. Food Grains — 0111; 0112; part of 0191, 0219, 0259, and 0291

8. Feed Grains — 0115; part of 0139, 0191, 0219, 0259, and 0291

9. Other Crops — Cotton; Hay and Pasture; Tobacco; Tree Nuts; Sugar Crops; Misc Crops.
(0131; 0132; 0133; part of 0119, 0139, 0173, 1079, 0191, 0219, 0259, and 0291)

10. Nursery/Horticulture — Grass Seeds; Greenhouse & Nursery Products; Landscape & Hort. Services.
(0182; 0189; 0780; part of 0139, 0191, 0219, 0259, and 0291)

11. Fruits and Vegetables — Fruits; Vegetables. (0134; 0161; 0171; 0172; 0174; 0175; part of 0119, 0139, 0179, 0191, 0219, 0259, and 0291)

12. Oil Bearing Crops — 0116; part of 0119, 0139, 0173, 0219, 0259, and 0291

13. Forestry/Fishing/ Ag Services — Forest Products; Forestry Products; Commercial Fishing.
(0710; 0720; 0750; 0760; 0254; 0810; 0820; 0840; 0850; 0910; 0920; 0970; part of 0181, 0191, 0219, 0259, 0279, and 0291)

14. Processed Meats/Eggs — Meat Packing Plants; Sausages & Other Prepared Meat; Poultry Dressing Plant; Poultry & Egg Processing; Fresh or Frozen Packaged Fish. (2011; 2013; 2016; 2017; 2092)

15. Dairy Processing — Creamery Butter; Cheese, Natural and Processed; Condensed & Evaporated Milk; Ice Cream & Frozen Desserts; Fluid Milk. (2021; 2022; 2023; 2024; 2026)

16. Processed Food and Kindred Products — Canned & Cured Sea Foods; Canned Specialties; ....
(2091; 2032; 2033; 2034; 2035; 2037; 2038; 2047; 2048; 2051; 2067; 2087; 2095; 2097; 2098; 2099; 2110; 2120; 2130; 2140)

17. Grain Milling/Flour — Flour & Other Grain Mill Prod.; Cereal Preparations; Rice Milling; ....
(2041; 2043-2046)

18. Beverage Processing — Malt Liquors; Malt; Wines; .... (2082-2086)

19. Fats/Oils — Cottonseed Oil Mills; Soybean Oil Mills; Vegetable Oil Mills, N.E.C.; ....
(2074-2077; 2079)

20. Food Services — 5800; part of 70

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Table A-1. OHFOOD: Ohio Input-Output Model Endogenous Sector Definitions (Continued)

Sector Name	SIC

<u>Non-Agricultural Sectors</u>

21. Mining
1011; 1021; 1031; 1041; 1044; 1051; 1062; 1081; 1092; 1094; 1099; 1111; 1211; 1310; 1321; 1411; 1422; 1423; 1429; 1442; 1446; 1452; 1453; 1454; 1455; 1459; 1472-1477; 1481; 1492; 1496; 1499; part of 1112, 1213

22. Construction
1380; 1520; 1522; 1530; 1541; 1542; 1611; 1622; 1623; part of 1629

23. Metal Industries
3312; 3313; 3315; 3316; 3317; 3320; 3331; 3332; 3334; 3339; 3340; 3351; 3353-3357; 3361; 3362; 3369; 3398; 3399; 3462; 3463; 3482; 3483; 3484; 3489; 3761; 3795

24. Apparel/Yarn/Leather
2210; 2220; 2230; 2240; 2251-2254; 2257-2259; 2261; 2262; 2269; 2270; 2281-2284; 2291-2299; 2310; 2320; 2330; 2340; 2350; 2360; 2370; 2380; 2391-2397; 2399; 3110; 3130; 3142; 3143; 3144; 3149; 3150; 3160; 3171; 3172; 3190; 3962; 3963; 3964; 3991; 3996; 3999

25. Wood/Paper/Publishing
2410; 2421; 2426; 2429; 2431; 2434; 2435; 2436; 2439; 2441; 2448; 2449; 2452; 2491; 2492; 2499; 2511; 2512; 2514; 2515; 2517; 2519; 2521; 2522; 2531; 2541; 2542; 2591; 2599; 2610; 2620; 2630; 2641; 2642; 2643; 2645; 2646; 2647; 2648; 2649; 2650; 2660; 2710; 2720; 2731; 2732; 2740; 2750; 2752; 2753; 2754; 2760; 2770; 2782; 2789; 2791; 2793; 2794; 2795

26. Chemical/Petroleum
2821-2824; 2830; 2841-2844; 2850; 2861; 2891; 2892; 2893; 2895; 2899; 2910; 2951; 2952; 2992; 2999; 3010; 3020; 3030; 3040; 3060; 3070

27. Stone/Clay/Glass
3210; 3221; 3229; 3230; 3240; 3253; 3255; 3259; 3261-3264; 3269; 3271-3275; 3280; 3291; 3292; 3293; 3295; 3296; 3297; 3299

28. Machinery and Equipment
3511; 3519; 3523; 3524; 3531-3537; 3541-3547; 3549; 3551-3555; 3559; 3561-3569; 3592; 3599; 3581; 3582; 3585; 3586; 3589; 3612; 3613; 3621-3624; 3629; 3631-3636; 3639; 3641; 3643-3648; 3825

29. Technology Industries
3572-3574; 3576; 3579; 3651; 3652; 3661; 3662; 3671-3679; 3691-3694; 3699; 3811; 3822-3824; 3829; 3830; 3841-3843; 3850; 3860; 3870; 3911; 3914; 3915; 3930; 3942; 3944; 3949; 3951-3953; 3955; 3961

30. Motor Vehicle Equipment
2451; 3711; 3713-3716; 3721; 3724; 3728; 3731; 3732; 3740; 3750; 3764; 3769; 3792; 3799

31. Misc. Service
3993; 3995; 7000; 7210; 7220; 7230; 7240; 7250; 7260; 7290; 7310; 7320; 7331; 7332; 7333; 7339; 7340; 7350; 7360; 7370; 7391-7395; 7397; 7399; 7620; 7630; 7640; 7690

Table A-1.   OHFOOD: Ohio Input-Output Model Endogenous Sector Definitions (Continued.)

Sector Name	SIC
Non-Agricultural Sectors	
32. Transportation/Communication	4010; 4040; 4110; 4120; 4130; 4150; 4170; 4210; 4220; 4230; 4410; 4420; 4430; 4440; 4450; 4460; 4510; 4520; 4580; 4710; 4722; 4723; 4740; 4780; 4810; 4820; 4830; 4890; 7520; 7530; 7542; 7549; part of 4789
33. Electricity, Gas and Sanitary	4610; 4910; 4920; 4940; 4952; 4953; 4959; 4960; 4970; part of 493
34a. All Wholesale/Retail Trade	5000; 5100; 5200; 5300; 5400; 5510; 5520; 5530; 5540; 5551; 5561; 5570; 5590; 5600; 5700; 5910; 5920; 5930; 5941-5949; 5960; 5980; 5990; 7396; 8042
34b. Food Wholesale/Retail Trade	5030; 5083; 5110; 5130; 5140; 5150; 5180; 5190; 5400; 5600
35. Financial/Real Estate	6000; 6100; 6710; 6720; 6733; 6790; 8910; 8930; 8990
36. Recreation and Amusement	7800; 7910; 7920; 7930; 7941; 7948; 7992; 7993; 7996; 7997; 7999
37. Health Services	0740; 8010; 8020; 8030; 8041; 8049; 8050; 8060; 8070; 8080; 8090; 8321; 8331; 8351; 8361; 8399
38. Education Services	8210; 8220; 8230; 8240; 8290
39. Government and Nonprofit	4311; 6732; 8400; 8610; 8620; 8630; 8640; 8650; 8660; 8690; 8922; part of 41, 491
40. Others	8800

Note: Food and non-food wholesale/retail trade are grouped together as Wholesale/Retail Trade in Tables 2 through 5.
        Food and non-food wholesale/retail trade are presented as separate categories in Table 1.