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The Interindustry Structure of the Kansas Economy

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The Interindustry Structure of the Kansas Economy

By M. Jarvin Emerson

with Leonard D. Atencio Phillip D. Brooks J. David Reed

K. WEAS OFFICE OF ECONOMIC ANALYSIS and PLANNING DIVISION, KANSAS DEPARTMENT OF ECONOMIC DEVELOPMENT

THE INTERINDUSTRY STRUCTURE OF THE KANSAS ECONOMY

bу

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with

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Office of Economic Analysis and Kansas Department of Economic Development Planning Division Report No. 21

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PREFACE

The increasing complexity of business and government decision making in an era of economic expansion evoked this study of the Kansas economy. The Governor's Economic Development Committee which functioned in the early 1960's concluded that a meager information base existed for identifying problems and potentials in the state's economy.

When the state legislature created the Office of Economic Analysis, one of the charges to the Office was to develop a more rigorous economic information system for the state. Shortly after the Office of Economic Analysis started operations, Kansas embarked on a state planning program through the Planning Division of the Kansas Department of Economic Development. This development made it desirable to integrate the economic information system with the state economic planning effort.

This study is technically known as a regional interindustry or inputoutput study. The study framework was selected because of its multiple uses by both state government and business. Funding for the study was provided by a Kansas legislative appropriation to the Office of Economic Analysis and by a grant from Housing and Urban Development.

The project had an auspicious start. The day the study began my house was demolished by a tornado and the state printing plant, which was printing questionnaires, was extensively damaged. However, two years after its start the basic matrix was completed in June, 1968.

Acknowledgments for a study of this magnitude of necessity must be lengthy.

The most important contribution to this project was made by the thousands of Kansas businessmen who cooperated with the interviewers in providing the

necessary data for the study.

Several of my graduate research assistants at Kansas State University in addition to those mentioned on the cover worked on the project. These were Ronald Adams, Richard Lichty, William Spellman, Thomas Vernon and Wayne Yorgason.

Mr. Earl Lyddane provided accurate computational assistance.

Langston, Kitch and Associates, Inc. wrote the computer programs for the study.

Interviewing was done by Dr. Paul Gilkison and Dr. Ray Coleman of the KSU College of Commerce and by John Wassberg, Arch G. Gothard, Jr., Throck M. Osborn, Melvin D. Robinson, Lyle H. Gugler, Steven M. Evans, Dennis C. Glaser, John Porter and Douglas P. Sweetland.

Mr. Ernest Maxwell, Chief of Research and Statistics, Employment Security Division, Kansas Labor Department, and Mr. James McDonald, Director, Kansas Department of Revenue, aided in obtaining useful data.

Miss Velda Deutsch provided efficient secretarial services throughout the project.

Manhattan, Kansas January, 1969 M. Jarvin Emerson

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Chapter 1

STATE ECONOMIC DEVELOPMENT AND ECONOMIC INFORMATION

Despite the mushrooming quantity of economic information at the national level, only a comparatively meager increase in the state and local economic data needed by businessmen and state and local government officials has become available. Businessmen require knowledge of the market structure and regional prospects for the areas in which they operate. In considering tax policy, capital expenditures, and related planning, governmental decision makers, also, need detailed information about the structure of the state's economy and the impact of factors which affect its performance. However, such knowledge of the state's production and income structure and of its economic ties with the rest of the national and world economy has been meager and has plagued decision makers in Kansas both in the state's government and private businesses.

This monograph present an economic information framework which is geared to the myriad requirements of both state government and private business.

Obviously, no framework can provide all the needed data; rather, the selection or construction of the data system should, within the capabilities of project resources, provide data for maximum economic planning.

The impetus for this investigation was a request for such data as expressed by Kansas businessmen in the report of the Governor's Economic Development Committee in 1962. Thus, this monograph presents (1) data applicable to the needs of Kansas businessmen and (2) a data system applicable to state government program planning.

In preparation for the discussion of the methodology and the results of this economic study presented in later chapters, the present chapter surveys the goals and general considerations of regional economic development.

REGIONAL ECONOMIC DEVELOPMENT

I. Goals

'To facilitate the maximization of the well-being of the people" is the vague phrase that often suffices to describe the objective of a state economic development program. In addition, however, the specific goals considered in this study are the following:

- A. To expand the volume of economic activity. An explicit goal of the state of Kansas is to increase the level of economic activity, particularly its total income and employment. The identification and development of new job opportunities is the charge of several pieces of legislation enacted in the past decade by the Kansas Legislature.
- B. To improve the economic welfare of state residents. An increase in economic activity will not necessarily raise the standard of living of state residents. An increase in real per capita income better reflects the extent to which Kansas residents realize an improvement in their level of living.

The distinction between these first two objectives underscores the fact that volume growth does not necessarily raise the per capita income of the state. In evaluating economic development priorities, this is often overlooked to the detriment of state development programs.

C. To strengthen the proficiency of the public sector. The expanding

- development of a state's economy will influence the demand for government services and capital expenditures.
- D. To improve or conserve the environment of the region. The pollution of air and water is the most publicized kind of environmental destruction; however, numerous other conditions influencing human environment must be recognized.

II. The Development Process

Before examining the economic information contained in this report, it will be useful to sketch briefly the nature of regional economic development.

What, for instance, are the processes which energize economic development in Kansas?

A useful approach to examining these processes influencing the performance of the economy is to divide the state's economic activities into two groups: (1) the economic specialties of the state that are sold to markets outside the state (the export sector) and (2) those activities that service the local population and the export industries (local sector). Since the export sector activities are linked to national and international markets and the local sector is linked to the export sector, an approach to analyzing regional growth is to distinguish between the internal and external economic linkages of the state's economy.

Internal Linkages

The pattern of internal development within a regional economy is closely tied to its structure, and the process of such economic specialization evolves in an identifiable manner. Numerous studies of growth patterns have concluded that there are "stages of economic growth" or

"an evolving structure of development." These stages are (1) initial area economic specialization, (2) initial processing activity expansion, (3)

"family" industry formation, (4) "agglomeration" development, and (5) "growth pole" concentration.

In its embryonic stage of development, a regional economy specializes in a product (i.e., cattle) or a service (i.e., railroading) of which part is marketed outside of the area (exported). After the internal processes of specialization are set in motion, the next step in the growth process will likely be tied to the first. For instance, the initial resource base will be further exploited by processors who have been attracted to and will locate at a raw material source. Thus, in these early stages of production, industries tend to locate at raw material sites, since early production processes are frequently weight or bulk reducing which lower transportation costs.

As the region continues to grow, its primary energy will be derived from new firms becoming either suppliers to the initial processors or utilizers of their outputs as inputs into these utilizing firms. In this manner linkages are established between firms' inputs or supply requirements and/or their output or markets. Consequently, one of the unique characteristics of regional development is the tendency for firms to develop in "families" which are structurally related, a tendency which encourages the growth of certain industries while virtually blocking entrance for others. This evolving nature of specialization and growth both nurtures and is constrained by the economic structure of the region.

Disregarding for the moment that the process may arrive at a plateau for any region at a level below "total development," the next phase of regional development generally exhibited is that of complexes of economic activity

forming a more diversified economic base for the region. This stage results from and contributes to the concentration of economic activity in a large city or metropolitan area. As the raw material processing industry expands and the initial satellite firms succeed, a cumulative process begins. Area expansion takes place as new firms are attracted by the advantages accruing to those firms and industries which can derive benefit from locating in an expanding industrial area. Thus, simply stated, existing firms attract new firms. Industries provide markets for other industries, or conversely, serve as suppliers for other industries. Because of these linkages, transportation costs tend to be minimized by adjacent locations and, in turn, further area expansion. The resulting concentration of economic activity is labeled "agglomeration."

Associated with this agglomeration are certain economies of scale which transform this assemblage of economic activity into a "growth pole." The internal scale economies of an individual firm are often such that its technological production characteristics require a large scale plant to produce efficiently. For a market oriented firm such a condition requires a large immediate market of the sort which is most accessible in a metropolitan area. These characteristics of individual firms are true, also, of "agglomerations." External economies result from a concentration of firms in one geographic area. Specialized services are needed to serve a growing number of firms. These, in turn, reduce costs for the basic firms and encourage the location of other firms to take advantage of these external economies. Large pools of specialized labor, more favorable transportation rates, the availability and maintenance of business machines, highly developed utility, communication, and transportation services, and

governmental services are but a few examples of the external cost saving features accruing even to unrelated firms in a concentration. Such activities are self-generating, and the resulting major economic concentrations have been referred to as "growth poles" to convey the idea that they are the areas within broader regions to which the bulk of economic activity gravitates. Certainly the current economic landscape lends support to such a view.

External Linkages

A region within a highly integrated national economy acts as a specialist. Characteristically unable to produce all of the goods and services it requires, a region imports these products and services, and, thus, forms linkages with external regions. Likewise, the area's exporting producers form linkages outside of the region and their activities result in a flow of income into the region which can be used for regional economic expansion and for the purchase of imports. Obviously, then, the external linkages of a regional economy play a crucial role in the performance of that economy. Too, the importance of its external markets is closely tied to the size of the region's internal economy, for a larger economy, having attracted its own service industries, is less dependent on imported goods and services. External linkages are of vital importance to Kansas' economy.

A theory of regional economic growth, important to this study, has developed around the export-base of an area. Economic activity in a region can be separated into two categories--internal and export market activity--and this distinction is made because of what is thought to be a causal relationship. Export market activity (with markets outside the region) is viewed as the initiating force in fostering internal regional economic

growth, and the level of activity in the remainder of the regional economy reflects the performance of the export base of the region. As income rises in the export sector, retail and service establishments expand their sales; conversely, a decline in export-derived income depresses the level of business serving the region. Thus, the level of export income, in large part, determines the performance of activity serving the local market. In addition, since capital tends to flow into a region primarily to develop export industries, increased capital promotes growth in both export activity and local activity. For these reasons, then, a major emphasis has been placed on the performance of a region's exports.

In determining the constancy of a region's exports, consideration must be given, also, to changes in demand from these external markets.

Alterations in demand derived from changing tastes, income, technology, transportation rates, and government policy require close scrutiny in anticipating fluctuations in the volume and composition of a region's exports.

This brief sketch of regional economic growth has emphasized the interdependence of economic activity, the concept of economic linkage. Changes in any industry trigger multiple changes in other industries which are directly or indirectly associated with it, and often relatively small changes are multiplied into sizable total effects on the economy.

Government Policy

Industry is not alone in initiating developments which affect the private sector of the economy. Government policy often significantly changes the rate of a state's economic development.

A state government is empowered to create and administer policies which affect the state's industries and the income of its residents. Unfortunately,

taxing and spending policies, as well as regulatory policies, have economic consequences often only casually understood. This effect is underscored by Table 1-1 which shows that expenditures by state government have risen more rapidly than state government income during the past two decades in response to the public's demand for increased public services. Inevitably, the consequences of state policy have grown.

State policy can be used, also, to consciously amplify desirable economic trends or to mitigate the effects of adverse developments. Tax and program policies contain the potential to improve the competitive position of the state.

OBJECTIVES OF THE STUDY

An economic information system designed to study economic development must focus simultaneously on the internal economic structure of the state and on its external ties. Further, the information system's data must facilitate the needs of public and private decision makers. For these reasons, during the design of the study, the heads of state and local government agencies and business and labor leaders met to discuss their requirements of such a system. Seven objectives, each directly related to the general goals of the state as described above, emerged as priority goals for the study.

The preceding discussion has identified the goals of the state and the interdependence of both business and government in determining the economic development of the state. In order to understand the interplay of these goals with both the state's economic structure and the government policy impacts, an economic information framework will be presented which reveals a major portion of this interdependence. The following pages describe the

seven primary goals of the present study.

First, the economic information system must be capable of multiple use to facilitate the maximum measure of state economic planning. The system must make possible an analysis of the impact of events and must provide consistent economic forecasts which would afford state and local government a better opportunity to relate their activities to the needs of the state and local areas.

Second, the study should provide a framework, reflective of state problems and needs, which will utilize the wealth of statistical information gathered by state agencies on an annual basis.

Third, the study should provide a frame of reference for partial studies. Investigations of particular aspects of the Kansas economy are constantly being conducted, and such studies can be enhanced by their reference to a general framework. Further, the study should indicate areas for additional research. Through such integrated frameworks, the total research efforts on the Kansas economy would yield increased returns.

Fourth, since the state's economy is continuously affected by changes in such factors as technology, government spending policies, and transportation rates, an information system should permit an identification of the impact of such changes. It should, then, provide the rationale for state policy decisions which could derive benefits from such changes or mitigate potential adverse effects. New industry frequently evolves out of research discoveries, and the ability to capitalize on these discoveries requires information as to how they might be fitted into a regional economy.

Fifth, the study should indicate the determinants of a priority system for economic development in the state of Kansas. Certain industries are

crucial to expanding income and employment opportunities in the state. A few of these industries will continue to grow without extraordinary development efforts because of the locational advantages available in Kansas. By channeling funds into other select industries, greater returns will be realized, and through an adequate study of the determinants of "family" industry development, these select industries can be identified. Certain industries are structurally related in their inputs and in their product markets; thus, the existing structure of an economy encourages the growth of certain industries while virtually blocking entrance for others. A rigorous identification of these structural relations in a state's economy would direct development efforts into proper channels.

Sixth, the study should indicate future labor requirements to enable more effective planning by the state's education system, particularly in the expanding area of vocational-technical training and retraining.

Seventh, the study's data should make possible reliable estimates of Kansas' export markets. This would provide valuable information to existing or new states for expanding their markets. The data should also provide the information necessary to estimate those direct and indirect effects of changes in demand which affect the export of Kansas products.

Report Format

This publication was written for Kansas businessmen and state and local government leaders. It was pretested for comprehensibility by several "volunteers." As a result, difficult ideas are frequently explained in more than one manner.

Chapter 3 contains an explanation of the format of the study. It is the pivotal chapter. The remaining chapters, which are much less demanding of the

reader, depend on an understanding of Chapter 3. The majority of readers will find it advantageous to omit the mathematical presentation of the model at the end of Chapter 3.

Sector definitions and output levels are presented in Chapter 4 as a background for interpreting the results of the study. Chapter 5 is the first of five chapters which summarize the results of the study.

The multiple uses of the study in measuring impacts on the Kansas economy and its numerous industries is presented in Chapter 10.

Finally, a survey of the techniques employed in constructing the study is contained in Chapter II.

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Chapter 2

THE KANSAS ECONOMY: HISTORICAL PERSPECTIVE

Before examining the current structure of the Kansas economy, it would be useful to sketch some of the major changes in the Kansas economy which have resulted from differential growth rates.

Aggregate Growth Trends

Total Kansas personal income was more than 2 1/2 times as large in 1967 as it was in 1950. Table 2-1 shows the expansion of state personal income from \$2,765 million in 1950 to \$6,961 million in 1967. The Kansas increase of 252 per cent was below the national increase of 276 per cent but above the Plains states increase of 239 per cent.

Table 2-1

PERSONAL INCOME, KANSAS, PLAINS, U.S., 1950-1967

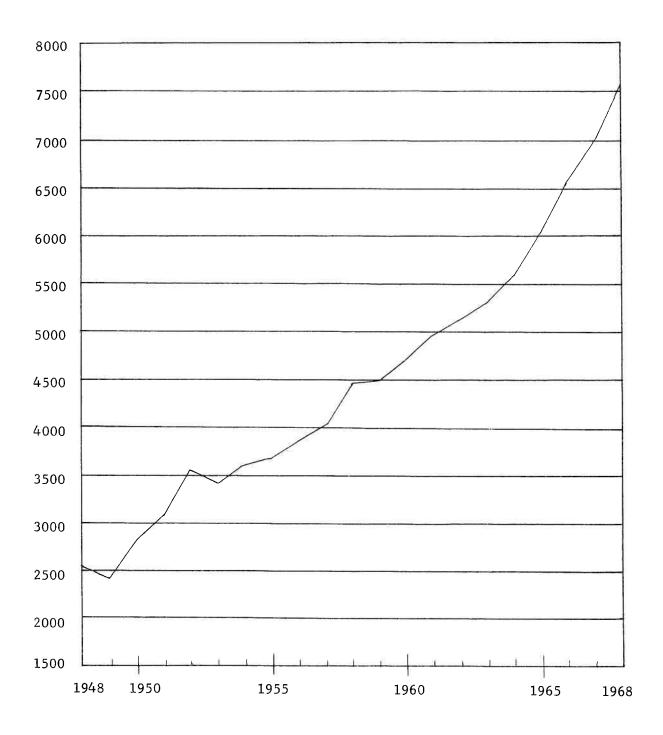
		(Millions)			ercent change al personal ince	Kansas as a percent of		
YEARS	Kansas	Plains	U. S.	Kansas	Plains	U. S.	U. S. total personal income	Plains total personal income
1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1964 1965 1966 1967	2,765 3,077 3,524 3,434 3,597 3,626 3,804 4,006 4,441 4,483 4,712 4,941 5,177 5,319 5,572 6,001 6,561 6,961	20,135 21,912 23,016 23,435 24,233 24,763 26,075 27,859 29,543 30,235 31,871 32,924 35,002 36,374 37,958 41,844 45,355 48,213	225,214 253,233 269,767 285,458 287,613 308,265 330,481 348,426 358,474 380,963 398,725 414,411 440,192 463,053 494,913 534,816 580,483 625,068	11.3 14.5 -2.6 4.7 0.8 4.9 5.3 10.8 0.9 5.1 4.8 4.8 2.7 4.7 7.7 8.5 6.1	8.8 5.0 1.8 3.4 2.2 5.3 6.8 6.0 2.3 5.4 3.3 6.3 3.9 4.3 10.2 8.4 6.3	12.0 6.5 6.2 0.7 7.2 7.2 5.4 2.9 6.3 4.7 3.9 6.2 5.2 6.8 8.1 8.5 7.8	1.2 1.2 1.3 1.2 1.2 1.2 1.1 1.1 1.2 1.2 1.2	13.7 14.0 15.3 14.6 14.8 14.6 14.4 15.0 14.8 15.0 14.8 14.6 14.7 14.8

Source: Survey of Current Business, August, 1968 (Office of Business Economics, U. S. Department of Commerce).

Figure 2-1

KANSAS PERSONAL INCOME, 1948-1968

(Millions of dollars)



Employment expanded from 1950 to 836,000 in 1967. During the past decade, except for 1966 and 1967, the state experienced net out-migration. This means that the natural increase in population (births minus deaths) was greater than the actual increase.

Industry Growth Trends

Growth, decline and instability have been characteristic of individual industries of the state's economy. The aerospace industry has been the most unstable of the state's industries. Employment in this industry dropped from 48,000 in 1957 to 30,000 in 1961 to 27,000 in 1963 then exceeded 40,000 again in 1967 only to decline again in 1968.

Despite the gyrations in the aerospace industry, durable goods manufacturing has been expanding with the result that total manufacturing activity in the state has increased. But, nondurable goods manufacturing has declined. These decreases have been largely in food processing an historically important industry in Kansas.

Employment in the food processing industry declined by more than 17 per cent from 1958 to 1968.

Less than half as many persons are engaged in farming now than 20 years ago. From 1958 to 1968 farm employment declined by 37 per cent.

As a result of widely varying industry growth rates, the structure of the Kansas economy has undergone substantial change. In 1958 more than 17 per cent of the state's employment was in farming. By 1968 this ratio had dropped to 10 per cent. Manufacturing's share of total employment has edged up slightly from 15 to 17 per cent during the ten year period. Employment in services accounted for 8 per cent of total employment in 1958 but 11 per cent in 1968. Government employment now accounts for 18 per cent of the

Table 2-2

EMPLOYMENT AND COMPONENTS OF EMPLOYMENT CHANGE, KANSAS, 1950-1960

		Employ	ment	Components of employment change				
Industry		in	11	Cha	The Area			
	INDUSTRY		1960	National growth	Indus- trial mix	Regional share	Total change	
1. <i>1</i> 2. 1	AgricultureForestry and fisheries	162,773 106	104,403 83	25,199 16	$-87,812 \\ -43$	4,243	-58,370 -25	
3. 1	Mining	14,756	14,503	2,284	-6,671	4,133	-254	
4. (Contract construction	50,345	48,425	7,794	-2,570	-7,143	-1,919	
6. 7. 8. 9. 0. 1. 2. 3. 4. 15. 16. 17. 18.	Food and kindred products mfg	22,680 398 3,570 2,797 9,217 4,223 7,044 3,014 13,555 22,424 31,936 8,782 6,939 9,262	22,574 518 5,124 2,407 13,427 7,391 12,256 2,662 33,472 30,400 23,135 12,700 7,409 10,656	3,511 62 553 433 1,427 654 1,090 467 2,098 3,471 4,944 1,360 1,074 1,434 1,780	3,041 -153 -233 -722 $1,655$ 661 $2,191$ -562 $11,772$ 732 $-15,225$ $1,250$ -884 -1 -120	6,658 212 1,234 -101 1,128 1,854 1,930 -257 6,046 3,572 1,480 1,309 279 -39 336	$\begin{array}{c} -10 \\ 12 \\ 1,55 \\ -39 \\ 4,21 \\ 3,16 \\ 5,21 \\ -35 \\ 19,91 \\ 7,77 \\ -8,80 \\ 3,91 \\ 46 \\ 1,39 \\ 1,99 \end{array}$	
20. 21. 22. 23.	Wholesale trade	11,500 25,257 19,600 20,455 71,791	13,496 28,354 19,933 22,781 85,119	3,910 3,034 3,167 11,114	-964 -3,423 -1,851 1,375 5,045	151 722 1,011 839	3,09 3; 2,35 13,35 9,45	
25. 26. 27. 28.	Hotels and other personal services Private households Business and repair services Entertainment, recreation services Medical, other professional services	14,386 17,206	29,767 22,734 19,491 16,706 5,317 107,130	3,222 2,227 2,664 885	$ \begin{array}{r} -2,329 \\ 207 \\ 1,234 \\ -791 \\ 27,289 \end{array} $	1,025 2,671 -4,398 -496 5,661	1,92 5,10 -50 -40 42,89	
30. 31.	Public administration	29,203 13,387	37,111 33,711	4,521 2,072	3,476 7,169	-89 11,083	7,9 20,3	
32.	Industry not reported	13,302	24,593	2,059	25,816	-16,584	11,2	
 T	otal	721,008	817,588	111,617	-31,441	16,403	96,5	

Source: U. S. Department of Commerce, Office of Business Economics, Growth Patterns in Employment by County 1940-1950 and 1950-1960, Volume 4 Plains.

total compared with 13 per cent in 1958.

An interesting comparative picture of the historical performance of the state's industries is presented in Table 2-2 which was compiled in a U. S. Department of Commerce study. In addition to summarizing industry employment in three census years, the table indicates the expansion of each industry if it had grown at the national average (national growth component), if it had grown at the rate that industry was growing nationally (industrial mix component), and the extent to which the industry grew faster or slower than that industry nationally (regional share component). The net result of the table shows that Kansas industries grew more rapidly than those industries nationally, but that Kansas had a high proportion of slow growth industries and, hence, had a slower overall growth rate than the nation.

Geographic Growth Trends

Economic activity has tended to be concentrated in a few areas of the state.

As evidenced by the changing distribution in population, the large counties are growing more rapidly. In 1950 the three largest counties in the state contained 25.9 per cent of the state's population. By 1960 this percentage had risen to 30.9 and by 1967 to 33.2 per cent. The ten largest counties contained 42.5 per cent of the state's people in 1950 and 52.9 per cent in 1967.

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		1		1	1	12	ELLSWORTH	2.7	-2.3 IM	ORRIS	OSAGE	23.1	52.8
REELEY	WICHITA	SCOTT	LAKE	YESS	≇ USH	BARTON	-12.5		.	-7.0 Ti	-1.1	RANKLIN	MIAMI
2.1	10.0	15 0	1 7 7	E 0	4.0	1 .		MAPPLERSON	MARION		1	5.1	.8
3.1	19.8	15.0	-1.7	- 5.2	-4.9	1	RICE	1.7	-3.0	CHASE	8.8		
		W. 10.		-	PAWNEE	1	-5.6	1.7	-3.0	-8.8		NDERSON	LIAN
AMILTON	FEARNI	FINNEY		RODCENYN	-6. 3	STAFFOR				L	-6.2	-5.3	-4.6
1	1.0	24.5	5	-3.3		13.1	RENO	HARVE 7		GREEN	*****		
.9		Ê	CRAY		EDVARDS	Τ	8.9			.	POODSO	ALLEN	BOURB
•		1	\$	FORD	- 9.9	PRATT	-	SEDCWI	resite .	-12	-8.4	-5.4	4.8
ROTRAT	CRANT	HASKEI	5. 4	16.2	AWOLZ	1	KINGMAN	┰ .	_ 6.	.1	FILLION	NEOSEO	ł
16 0	10 2	27.6		1011	-5.1	- 5.5	2.0	8.	3	ELK	1.7	-1,2	CRAWFO
16.8	18.3	27.6	MEADE	CLARK	┨ ```	BARBER	- 3.9	SUMNER	COWLE		44.1	-1.2	 5
HOTE	TEVERS	SEWAR		1	COMANCHE		HARPER	-	[""	-14	MONT-	LABETTE	10
	0.0		-2.3	- 4.5	-5.9	-12.3	-12.0	-3.9	-3,	4 CHAUT	The second secon		CHEROK
16.2	2.8	.9	1		-5.9		1 ==.0		1 ,	-10	2 .1	1.5	16

Chapter 3

THE INPUT-OUTPUT FRAMEWORK: THE SCHEMATIC AND MATHEMATICAL MODELS

A regional input-output model provided the basic framework for this study of the Kansas economy. This chapter presents the model initially in general terms and then in a more rigorous mathematical format.

The main theme of an input-output or interindustry study is <u>economic</u> <u>interdependence</u>. In a highly specialized economy such as characterizes the United States and its geographic components, there are several stages of production involved in delivering a product or service to the ultimate consumer. Since numerous industries sell the majority of their output to other industries rather than to final markets, this intermediate demand for the production of an economy represents a sizable portion of the total activity of an economy. Nationally interindustry transactions represent more than 50 per cent of total dollar value transactions. Thus, the activity of one industry may depend on the activities of several other industries, and these are the interrelationships that are captured in an input-output investigation.

An input-output model divides the economy into a number of industries or sectors and then establishes the magnitude of the flows of products and services between these industries. These flows represent industry's purchases from and sales to other industries, individuals, or government.

Three tables are basic to an input-output system: the transactions matrix, the direct requirements matrix, and the direct and indirect requirements matrix.

This chapter explains the input-output system analysis initially through a highly simplified example and then through an interpretation of the Kansas input-output tables.

SIMPLE ILLUSTRATIVE INPUT-OUTPUT SYSTEM

Input-Output Transactions Matrix

A brief hypothetical transactions table such as Table 3-1 illustrates a typical transactions table for the Kansas economy.

Table 3-1

Hypothetical Input-Output Transactions Matrix (millions of dollars)

Purchasing Sectors Selling Sectors	Farming	Mfg.	Trade	Final Demand	Total Output
Farming	4	8	2	16	30
Manufacturing	7	15	6	22	50
Trade	6	5	4	10	25
Final Payments	13	22	13	0	48
Total Inputs	30	50	25	48	153

Each column shows the purchases and payments made by that <u>column sector</u>. For instance, the Farming sector, in order to produce its \$30 million output, purchased \$4 million from Farming, \$7 million from Manufacturing, \$6 million from Trade, and made \$13 million of payments to the Final Payments sector. Conversely each <u>row</u> indicates the sales of that <u>row sector</u> to the <u>column sectors</u>. Again focusing on Farming, the Farming row sector sells \$4 million to Farming, \$8 million to Manufacturing, \$2 million to Trade, and \$16 million to Final Demand for a Farming row sector total of \$30 million of output.

For each sector, total inputs (purchases and payments) equal total outputs (sales).

Direct Requirements Matrix

The second matrix is the Direct Requirements Matrix. This indicates for each column industry what proportion of purchases it makes of each row industry to produce one dollar of output. The hypothetical transactions matrix presented in Table 3-1 illustrates the manner in which the Direct Requirements Matrix is derived. If each column entry in Table 3-1 is divided by the corresponding column total, the result will be a direct requirements matrix such as Table 3-2. The <u>sum</u> of each column is one, and, thus, each

Table 3-2

Direct Requirements Matrix

	Farming	Mfg.	Trade
Farming	.13	. 16	.08
Manufacturing	.23	.30	.24
Trade	.20	.10	.16
Final Payments	.44	.44	.52
Total	1.00	1.00	1.00

column entry indicates the direct purchases from each row sector necessary to produce one dollar of output for the column sector. For instance, the Manufacturing column indicates, in order to produce one dollar of Manufacturing output, Manufacturing must purchase \$.16 from Farming, \$.30 from Manufacturing, \$.10 from Trade, and \$.44 from Final Payments. These dollar fractions may be referred to as input coefficients.

There is yet another way in which this matrix may be read. In one sense each column is a "production recipe" needed to produce one dollar of output for the industry which that column represents. Importantly, the assumption of such "production recipes" is that they do not change for different levels of output. This and other assumptions are elaborated in a later portion of the chapter.

The values of the Kansas Direct Requirements Matrix are derived in the fashion as those of the simple matrix of Table 3-2.

Direct and Indirect Requirements Matrix

From the direct requirements matrix, the direct effects of a change in output in a particular industry can be measured; however, an adequate measure of the effects of a change in output must indicate the multiple indirect effects of such changes. If an industry requires more rubber to increase its output, then obviously more inputs to the rubber industry are needed to produce the increase. In turn, suppliers of the rubber industry, to increase their production, require additional inputs from their suppliers. These successive rounds might be compared to the ripples resulting from a rock being dropped into a pool. This interaction is widespread, but it diminishes in intensity as successive steps are carried out.

The information contained in the hypothetical direct requirements matrix (Table 3-2) indicates an additional \$10 million of Manufacturing requires \$1.6 purchases from Farming \$3 purchases from Manufacturing, and \$1 million purchases from Trade. But, in order to supply these additional requirements each of these industries must increase its production. These sectors, in turn, must purchase more from their suppliers in the proportions indicated in Table 3-2. For instance, for Trade to produce the additional \$1 million

which the Manufacturing sector requires to produce its extra \$10 million output, the Trade sector must purchase \$80,000 from Farming, \$240,000 from Manufacturing, and \$160,000 from Trade. Of course, this requires an output increase from each of the sectors supplying Trade, and in turn, these sectors must purchase additional inputs from other sectors. As the illustration suggests, these <u>indirect requirements</u> diminish rapidly as they

Table 3-3

Direct and Indirect Requirements Matrix

	Farming	Mfg.	Trade
Farming	1.2844	.3242	.2149
Manufacturing	.5493	1.6360	.5174
Trade	.3712	.2710	1.3031

are traced through several "rounds." Nevertheless, these indirect requirements are critical in ascertaining the total requirements of all industries made necessary by additional output in a particular one.

The task of determining the sum of all of these indirect requirements is arduous for even so brief a matrix as the hypothetical matrix. However, by utilizing matrix algebra and a high speed computer even an extensive matrix can be manipulated to yield the total requirements of the economy whenever a particular industry increases its output.

The total direct and indirect requirements for the hypothetical matrix are presented in Table 3-3. A column shows the requirements from each industry in order for the column industry to make a one dollar delivery to final demand, or roughly, to increase its output by one dollar.

ACCOUNTING SYSTEMS AND INPUT-OUTPUT DATA

The Firm Flows

Since most of the data used in an input-output transactions matrix is gathered from individual firm records, it is worthwhile to consider the nature of the firm's transactions which are reflected in an input-output transactions matrix.

Figure 3-1 is a schematic input-output flow diagram showing the firm information which is summarized by a transaction matrix.

The schema represents firm purchase transactions on the left side; on the right side are shown the allocation of the firm's sales-transactions. The diagram shows purchases by Firm X of goods and services from the other Firms in the economy grouped into a predetermined industry classification. Firm X also pays wages, salaries, profits, and interest to Households, retains profits and depreciation allowances as Savings, and pays taxes to Government. Additionally, the firm may make purchases, Imports, from firms or individuals which are outside of the region being studied.

The right hand side of the diagram presents a general picture of the sales of the firm. Firm X sells its products to <u>Other Firms</u>, to <u>Households</u> for consumption, to <u>Capital Formation</u> to increase the economy's productive capacity, to Government, or to firms outside of the region (Exports).

Another approach to examining input-output data is to consider the matrix's information requirements in terms of a firm's accounting system.

Table 3-4 indicates the data required of individual firms in order to construct a transactions matrix of the type used for Kansas. Table 3-4 reflects in dollar terms the debit and credit transactions or Kansas' firms and indicates the direct allocations of these transactions to other firms

Purchases Sales Kansas Firms Kansas Firms Using Output of Firm X Raw Materials Semi-Finished Goods Trade Financial Services **Business Services** Kansas Households Firm X Payments Kansas Households 25 Capital Formation Savings Government Government Imports Non-Kansas Firms Exports Sales to Firms and Households Outside Kansas

Figure 3-1
Flows Summarized By An Input-Output Matrix

Table 3-4
Accounting Information Used in Input-Output Matrix

DEBIT	CREDIT
I. Inputs Purchased in State	I. Sales to Kansas Firms
A. From industry A 100,000	A. To industry D
B. From industry B 300,000	B. To industry E
C. From industry C 400,000	II. Sales to Firms Outside of Kansas
II. Inputs Purchased Out of State	A. To industry D
A. From industry A 50,000	B. To industry E
B. From industry B 25,000	III. Final Demand Sales
C. From industry C 40,000	A. To consumption
III. Value Added	B. To investment
Wages and salaries 500,000	C. To Government
Profits paid out 100,000	IV. Inventory Change
Profits retained 100,000	Raw materials
Interest paid 50,000	Finished goods
Depreciation 100,000	
Taxes	

and accounting entries. The debit transactions, for instance, are divided into three groups. Group I, Inputs Purchased in State, shows by individual firm, the total amounts of inputs purchased by a particular firm from supplying firms located in Kansas. Group II, Inputs Purchased Out of State, shows, again by individual supplying firms, the amount of inputs purchased by a particular firm from out of state. Group III, Value Added, allocates to other debit entries the remaining purchases of goods and services, profit allocations, depreciation costs, and interest and tax payments. The right hand side of the "ledger" indicates a firm's credit transactions. Group I, Sales to Kansas Firms, shows a firm's sales to other individual Kansas firms which use the products in their own production processes. Group II indicates sales to out-of-state firms. Group III, Final Demand Sales, allocates a firm's credits to consumption sales, to investments, to government, and to sales to out-of-state firms. Group IV, Inventory Change, shows a firm's credits that have accrued as a result of inventory balances.

AN INTERPRETATION OF THE KANSAS INPUT-OUTPUT MATRICES

To this point the present chapter, in describing a regional inputoutput model, has examined simplified matrix forms similar to those used in
the Kansas Input-Output Transactions Matrix and has discussed input-output
data in terms reflective of the accounting systems which, in part, generate
that data. A further step useful in describing the manner by which the
transactions matrix must be read is an illustrative discussion of one
specific and complete industry section, Meat Products, from the overall
transactions matrix. This discussion will relate the Meat Products sector
to the Kansas Transactions Matrix, the Kansas Direct Requirements Matrix,
and the Kansas Direct and Indirect Requirements Matrix.

Accounting Characteristics

A full understanding of the Kansas Input-Output Transactions Matrix requires an initial explanation of six specific accounting characteristics that affect the interpretation of the overall matrix and that make that interpretation clear.

- The flows in the transactions matrix represent for each industry or sector in the state purchases from and sales to the other sectors valued in 1965 prices.
- 2. All transactions are valued in producer's prices, rather than in purchaser's prices. The difference between the former and the latter are marketing and related costs. Individual marketing costs, such as transportation, and retail and wholesale trade, are charged to the purchaser as a direct purchase from those sectors rather than as part of the purchase price of the commodity.
- 3. The output and associated transactions of the retail and wholesale sectors are treated on a gross margin basis, and operating costs plus net revenue are roughly gross sales minus cost of goods sold. For instance, if a machinery manufacturer purchases fabricated metal parts from a wholesaler, the transaction is treated as if he were purchasing a marketing service from the wholesaler (the wholesaler's margin) and the parts from the Fabricated Metal Industry. If the transactions were not handled in this manner many interindustry links would be blurred by showing them first flowing to a trade sector and, then, to the processing or final demand sector. In summary, commodities purchased by the trades sectors for resale do not enter either the trades columns or rows, but rather, they are

- shown as a flow directly to the consuming sector.
- 4. The input-output table contains only purchases used in current production; it excludes capital expenditures. The capital that is "used up" in current production appears as depreciation and is included in the Gross Savings sector. For industries selling capital goods, the goods are shown as sales to Gross Private Investment rather than to the industry making the purchase.
- 5. The entire output of an establishment is attributed to the industry of the establishment's primary output. Although this is consistent with standard reporting procedures, it gives rise to heterogeneity in industry groups. For instance, if an establishment which produces primarily meat products also produces soap, the total output is assigned to the Meat Products sector.
- 6. Although a base year was established, there were a few deviations for "abnormal" transactions. The most significant of these was the exclusion of Inventory Change in the farming sectors. It was concluded that a lesser distortion of normal relationships would result if unusually large inventory changes in the farm sectors were disregarded.

Kansas Transactions matrix: Column Interpretation

Table 3-5, a reproduction of column 21, the Meat Products sector, from the Kansas Input-Output Transactions Matrix is read in the same manner as was the hypothetical version of the matrix (Table 3-1). Column 21 shows the purchases (in thousands of dollars) by the Meat Products industry which were necessary to produce its 1965 output of \$590,639,000. The overall Kansas Input-Output Transactions Matrix similarly represents all major Kansas industries.

Γ			$\overline{}$
	INTERINDUSTRY FLOW OF GOODS AND SERVICES IN THE KANSAS ECONOMY, 1965 (Thousands of Dollars)		Meat Products
-		1	21
	Corn	2	0
	Sorghum	3	0
	Other Grains	4	0
		5	0
IING	Soybeans Hay	6	43
FARMING	Dairy Products	7	64
	Poultry & Poultry Products	8	8,500
	Cattle	9	315,490
	Hogs	10	82,140
	Other Agricultural Products	11	6,069
	Agricultural Services	12	0
	Crude Oil & Natural Gas	13	0
NC	Oil & Gas Field Services	14	0
MINIM	Nonmetallic Mining	15	0
	Other Mining	16	0
NO.	Maintenance & Repair	17	394
CONSTRUCTION	Building Construction	18	0
NSTR	Heavy Construction	19	0
00	Special Trade Construction	20	0
	Meat Products	21	25,975
	Dairy Products	22	0
	Grain Mill Products	23	0
	Other Food & Kindred Products	24	67
	Apparel	25	0
	Paper & Allied Products	26	3,587
	Printing & Publishing	27	161
	Industrial Chemicals	28	0
	Agricultural Chemicals	29	0
	Other Chemicals	30	0
	Petroleum & Coal Products	31	64

ğ	Rubber & Plastics	32	0
MANUFACTURING	Cement & Concrete	33	0
FACT	Other Stone & Clay	34	0
MAN	Primary Metals	35	0
	Fabricated Metals	36	0
	Other Fabricated Metal Products	37	0
	Farm Machinery	38	0
	Construction Machinery	39	0
	Food Products Machinery	40	11
	Electrical Machinery	41	0
	Other Machinery	42	0
	Motor Vehicles	43	0
	Aerospace	44	0
	Trailer Coaches	45	0
	Other Transportation Equipment	46	0
	Other Manufacturing	47	0
Ė	Railroad Transportation	48	2,000
TRANSPORT- ATION	Motor Freight	49	3,814
IRAN	Other Transportation	50	0
1	Communications	51	351
UTILI	Electric Gas & Sanitary Services	52	952
	Groceries	53	700
ALE	Farm Products	54	4,761
WHOLESALE	Machinery & Equipment	5.5	3,800
3	Other Wholesale Trade	56	5,753
	Farm Equipment Dealers	57	0
11	Gasoline Service Stations	58	0
RETA		59	0
_	Eating & Drinking	-	0
	Other Retail Trade	60	2,322
R.E.	Banking	61	
F.I.R	Other Finance	62	2
	Insurance & Real Estate	63	3,764
	Lodging Services	64	0
ES	Personal Services	65	18
SERVICES	Business Services	66	367
SE	Medical & Health Services	67	0
11	Other Services	68	782
-	Education	69	0
	Households	70 .	60,382
	Gross Savings	71	2,934
AL	Federal Government	72	1,145
FINAL	State Government	73	777
24	Local Government	74	308
	Imports	75	53,141
	Total Purchases	76	590,639

The following discussion merely verbalizes the reading of the Meat Products sector, Industry 21. As will be recalled from the previous discussion of the hypothetical version of the matrix (Table 3-1) the amount of purchases made by the Meat Products sector can be determined by reading down the column.

- a. Reading from the top, the Meat Products industry purchased \$21 thousand of hay used in stockyard operations in the industry.

 Technically, this is not meat packing, but auxiliary stockyard operations of meat products firms are included because, as will be recalled from the discussion of the accounting characteristics of the system, the entire output of the firm is classified in the industry of its primary output.
- b. Industry 21 purchased \$64 thousand of Dairy Products which were used in processed meat products.
- c. The industry purchased \$8,500,000 from Poultry, \$315,490,000 from Cattle, \$82,140,000 from Hogs, and \$6,069,000 from other Agricultural Products from farmers in Kansas.
- d. The industry made expenditures of \$394,000 for Maintenance and Repair of existing plant and equipment.
- e. Firms in the Meat Products industry purchased \$25,975,000 meat products from other firms in the industry, purchases attributable to industry specialization.
- f. Industry purchases of Transportation underscore an additional accounting characteristic. The Meat Products industry purchased \$2,000,000 of Railroad Transportation and \$3,814,000 of Motor Freight Transportation in acquiring its inputs, because trans-

portation expenses are charged to the purchaser, not to the seller. Thus, transportation purchases do not represent the cost of the shipping of the output of the meat products industry. Each industry is charged with the transportation expenses involved in obtaining its inputs but not those incurred in shipping its output.

- g. A third accounting characteristic employed in constructing the table is seen in purchases from the wholesale trade sectors. These represent purchases of only the services of the wholesaler, not purchases of goods, for the entire output of a trade sector is defined as total sales minus the cost of goods sold. For further discussion of the rationale for this see #3 under "Accounting Characteristics" above.
- h. Row 70 indicates that the Meat Products industry made payments to Households in the amount of \$60,382,000. The major portion of this total was for the wages and salaries to employees of meat products firms. Included also in the total payments to households were dividends, interest, and rent paid directly to households by firms in the industry.
- i. The \$2,934,000 of Gross Savings which appears in row 71 represents retained earnings and depreciation.

The depreciation item is consistent with the fourth accounting characteristic enumerated in "Accounting Characteristics" mentioned above. The purchases in any column represent purchases for current production only, and capital purchases are excluded as indicated. Depreciation represents the amount of capital "used up" in current production.

- j. Taxes and fees paid to the Federal Government of \$1,145,000 are indicated in row 72. Similarly, rows 73 and 74 indicates taxes and fees paid to state and local government.
- k. Imports, row 75, represent the total of all goods and services purchased by the industry from out-of-state sources.

Kansas Transactions Matrix: Row Interpretation

Sales of the meat products industry are shown in row 21. For convenience row 21 has been reproduced in Table 3-6. Row 21 data are to be interpreted in the same manner as that found in the hypothetical version of the matrix (Table 3-1).

- entry is a sale of \$25,975,000 to the Meat Products industry. This transaction was encountered in the discussion of column 21 and needs no further comment.
- b. The next sales listed are to Grain Mill Products firms and Other Food and Kindred Products firms in the amounts of \$144,000 and \$3,256,000 respectively. The \$5,039,000 sale to Other Chemical firms is primarily tallow.
- c. The next major sale is to Eating and Drinking firms in the amount of \$6,870,000.
- d. The \$5,666,000 in column 63 represents Insurance claims paid to meat products firms by insurance companies. (For further information pertaining to this, see the discussion of the insurance industry in the section of sector definitions).
- e. As indicated by the entry in column 70, the meat products industry sold \$91,284,000 to Kansas Households. This represents the first

Table 3-6

										FARM	I :: G		
	OF G	TERINDUSTR OODS AND S IN THE KAN ECONOMY, 1 usands of	ERVICES SAS 965		Соги	Sorglum	Wheat	Other Grains	Suyheans	llay	Barry Preducts	Poultry & Poultry Products	Cattle
					1	2	3	4	5	6	7	8	9
Mea	at Produc	ts		21	0	0	0	0	0	0 F A C T U	0	0	0
									SASU	FACTU	R I :, G		
Other Food & Kindred Products	Apparet	Paper & Allied Products	Printing & Publishing	Industrial Chemicals	Agricultural Chemicals	Other Chemicals	Petroleum & Coal Products	Rubber & Plastics	Cement & Concigne	Other Stone & Clay	Primary Metals	Fabricated Metals	Other Fabricated Metal Products
24	25	26	27	28	29	30	31	32	33	34	35	36	37
3,256	0	0	0	0	0	5,039	0	0	0	0	0	0	0
TIES		WHOLE	SALE			RET.	AIL		F	F. I. R. E			
Electric Gas & Samitary Services	Groceries	Farm Products	Nachinery & Equipment	Other Wholcsale Trade	Farm Equipment Dealers	Gasoline Service Stations	Dating & Drinking	Other Retail Trade	Banking	Other Finance	Însurance & Real Estate	Lodging Services	Personal Services
52	53	54	55	56	57	58	59	60	61	62	63	64	65
6	0	0	0	0	0	0	6,870	0	0	0	5,666	165	0

Table 3-6 (continued)

				MIN	ING		C () N S T R	UCTI	ИС			
Hogs	Other Agricultural Products	Agricultural Services	Crude Oil & Natural Gas	Oil & Gas Field Services	Nonmetallic Mining	Other Mining	Maintenance & Repair	Building Construction	Heavy Construction	Special Trade Construction	Muat Products	Dairy Products	Grain Mill Products
10	11	12	13	14	15	16	17	18	19	20	21	22	23
0	0	0	0	0	0	0	0	0	0	0	25,975	0	144
										I R A N :	SPORT	ATIO	MUTILI
G Farm Machinery	ດ Construction Machinery	Food Products Machinery	F Electrical Machinery	۲۰ Other Machinery	£ Notor Vehicles	Aerospace	o Trailer Coaches	9 Other Transportation Equipment	5 Other Manufacturing	α Railroad Transportation	6 Motor Preight	o Other Transportation	Communications
0	0	0	0	4 00 15 0	0	0	0	0		0			0 0
SERVI	ICFS						FII		EMAN				
Business Services	Medical & Health Services	Other Services	Education	Households	Gross Private Investment	Change in Finished Goods Inventory	Federal Government Defense	Federal Government Non-Defense	State Government	Local Government	Exports	Total Final Demand	Total Output
66	67	68	69	70	71	72	73	74	75	76	77	78	79
0	5,579	0	0	91,284	0	- 654	18,773	0	618	65	427,852	537,938	590,639

entry in the "final demand" grouping. Sales prior to this were to "intermediate demand" or for further processing.

The purchase of meat products by Households ignores the fact that the meat may have been purchased from a retail or wholesale firm. The trade sectors are by-passed except for the margin as mentioned earlier.

- f. The negative value in column 72 shows a decline in Finished Goods
 Inventory over the previous period. In other words, during 1965
 the industry sold \$654,000 more than it produced.
- g. Federal Government Defense purchased \$18,773,000 of the industry's output. State Government and Local Government both purchased small amounts.
- h. The remaining \$427,852,000 of Final Demand was sold to individuals or industries outside of Kansas.
- i. The total output figure in column 79 of the Meat Products sector table is, of course, equal to the total purchases figure in row 76 of column 21 of the Kansas Input-Output Transactions Matrix.

The foregoing discussion emphasizes the fact that the transactions matrix is a double entry accounting system employing a few special accounting characteristics to allow for consistency or to focus on the major operational elements of the economy.

Kansas Direct Requirements Matrix

As indicated by the illustrative simple matrix of Table 3-2, the direct requirements matrix indicates in each column the purchases necessary to produce \$1 of output of the column industry. These values are obtained simply by dividing the numbers in a column by the total inputs in that

column. Consequently, each column of the direct requirements matrix adds to unity.

Column 21, reproduced in Table 3-7, is used to illustrate the interpretation of the Kansas Direct Requirements Matrix. Each entry indicates the fraction of a dollar input from the respective industry required to produce one dollar of output in the meat products industry. The columns in the direct requirements matrix have been called "production recipes." Assuming that this relative input mix does not change with output levels, the direct requirements from other industries necessary to support any level of output of the meat products industry can be determined.

In order to determine the requirements from other industries to produce an additional \$50 million of meat products, simply multiply each entry in column 21 by \$50 million.

Kansas Direct and Indirect Requirements Matrix

The preceding section dealt with the purchases necessary to support a level of output of a particular industry. From another viewpoint the direct requirements matrix might be considered to focus on the <u>direct impact</u> of output changes in a given industry on other industries. However, it must be remembered that a complete direct-indirect impact study of the Kansas economy would also reveal the multi-level stages of indirect impacts as each industry would in turn make its purchases and sales felt on a variety of contributing industries.

Column 21 from the Kansas Direct and Indirect Requirements Matrix is reproduced in Table 3-8. The column shows the total direct and indirect effects on each industry resulting from a change in one dollar delivery to final demand by the Meat Products Industry. Nearly all industries experience some impact.

		_	
	DIRECT PURCHASES PER DOLLAR OF OUTPUT KANSAS, 1965		Neat Products
	Corn	1	
	Sorghum	2	
	Wheat	3	
	Other Grains	4	
	Soybeans	5	
FARMING	ltay	6	.000,072
FAR	Dairy Products	7	.000,109
	Poultry & Poultry Products	8	.014,392
	Cattle	9	.534,151
	Hogs	10	139,070
	Other Agricultural Products	11	.010,275
	Agricultural Services	12	
	Crude Oil & Natural Gas	13	
MINING	Oil & Gas Field Services	14	
M	Nonmetallic Mining	15	
	Other Mining	16	
NOI	Maintenance & Repair	17	.000,667
RUCT	Building Construction	18	
CONSTRUCTION	Heavy Construction	19	
0	Special Trade Construction	20	
	Meat Products	21	.043,979
	Dairy Products	22	
	Grain Mill Products	23	
	Other Food & Kindred Products	24	.000,114
	Apparel	25	-
	Paper & Allied Products	26	.006,073
	Printing & Publishing	27	.000,273
	Industrial Chemicals	28	
	Agricultural Chemicals	29	
	Other Chemicals	30	
	Petroleum & Coal Products	31	000,109

	n 11 c Dissilier	22	
၌	Rubber & Plastics	32	
URID	Cement & Concrete	33	
MANUFACTURING	Other Stone & Clay	34	
MANU	Primary Metals	35	
- 7	Fabricated Metals	36	
	Other Fabricated Metal Products	37	
	Farm Machinery	38	
	Construction Machinery	39	
	Food Products Machinery	40	.000,018
	Electrical Machinery	41	
	Other Machinery	42	
	Motor Vehicles	43	
į į	Aerospace	44	
	Trailer Coaches	45	
	Other Transportation Equipment	46	
	Other Manufacturing	47	
RT-	Railroad Transportation	48	.003,386
TRANSPORT- ATION	Motor Freight	49	.006,458
TRA A	Other Transportation	50	
1	Communications	51	.000,594
UTILI TIES	Electric Gas & Sanitary Services	52	.001,611
	Groceries	53	001 ,1 85
WHOLESALE	Farm Products	54	.008,061
HOLE	Machinery & Equipment	55	.006,434
В	Other Wholesale Trade	56	.009,740
	Farm Equipment Dealers	57	2-18-132
11	Gasoline Service Stations	58	
RETA II	Eating & Drinking	59	2-01
	Other Retail Trade	60	
	Banking	61	.003,931
F.I.R.E.	Other Finance	62	.000,003
F. I	Insurance & Real Estate	63	.006,373
	Lodging Services	64	
	Personal Services	65	.000,030
ES	Business Services	66	.000,622
SERVICES	Medical & Health Services	67	
SE	Other Services	68	.001,324
	Education	69	
	Households	70	.102,232
	Gross Savings	71	.004,968
SINIS	Federal Government	72	.001,938
FINAL PAYNENTS	State Government	73	.001,315
W. I		74	.000,521
FIN	Local Government	75	.089,971
	Imports	10	E 2
-	Total	# ETSMO	1.000,000

Table 3-8

	DIRECT AND INDIRECT REQUIREMENTS PER DOLLAR OF DELIVERY TO FINAL DEMAND IN THE KANSAS ECONOMY, 1965		Meat Products
	Corn	1	0.054474
	Sorghum	2	0.107438
	Wheat	3	0.022753
	Other Grains	4	0.000686
	Soybeans	5	0.001337
FARMING	Нау	6	0.120729
FAR	Dairy Products	7	0.000241
	Poultry & Poultry Products	8	0.015064
	Cattle	9	0.700583
	Hogs	10	0.151418
	Other Agricultural Products	11	0.014086
	Agricultural Services	12	0.030345
	Crude Oil & Natural Gas	13	0.007354
ING	Oil & Gas Field Services	14	0.000764
MINING	Nonmetallic Mining	15	0.000015
	Other Mining	16	0.000360
N.C	Maintenance & Repair	17	0.007641
CTI	Building Construction	18	0.000000
CONSTRUCTION	Heavy Construction	19	0.000066
000	Special Trade Construction	20	0.000407
	Meat Products	21	1.046442
	Dairy Products	22	0.000159
	Grain Mill Products	23	0.070844
	Other Food & Kindred Products	24	0.008237
	Apparel	25	0.000221
	Paper & Allied Products	26	0.009781
	Printing & Publishing	27	0.002092
	Industrial Chemicals	28	0.020580

	Agricultural Chemicals	29	0.001268
	Other Chemicals	30	0.001335
	Petroleum & Coal Products	31	0.010376
	Rubber & Plastics	32	0.000178
MANUFACTURING	Cement & Concrete	33	0.000134
ACTU	Other Stone & Clay	34	0.000173
ANUF	Primary Metals	35	0.000228
Σ	Fabricated Metals	36	0.000109
	Other Fabricated Metal Products	37	0.000499
	Farm Machinery	38	0.004863
	Construction Machinery	39	0.000156
	Food Products Machinery	40	0.000189
	Electrical Machinery	41	0.000120
	Other Machinery	42	0.000445
	Motor Vehicles	43	0,000013
	Aerospaco	44	0.000003
	Trailer Coaches	45	0.000138
	Other Transportation Equipment	46	0.000051
	Other Manufacturing	47	0.000673
RT-	Railroad Transportation	48	0.006444
TRANSPORT- ATION	Motor Freight	49	0.012633
TRA A	Other Transportation	50	0.000256
-IT-	Communications	51	0.006010
UTILI TIES	Electric Gas & Sanitary Services	52	0.012570
[1]	Groceries	53	0.002649
SALE	Farm Products	54	0.021722
WHOLESALE	Machinery & Equipment	55	0.010759
1	Other Wholesale Trade	56	0.041382
	Farm Equipment Dealers	57	0.012788
IL	Gasoline Service Stations	58	0.002517
RETAIL	Eating & Drinking	59	0.000786
	Other Retail Trade	60	0.000380
	Banking	61	0.008561
F.I.R.E.	Other Finance	62	0.000753
٦.	Insurance & Real Estate	63	0.013601
	Lodging Services	64	0.000747
	Personal Services	65	0.003619
CES	Business Services	66	0.004047
SERVICES	Medical & Health Services	67	0.000116
O)	Other Services	68	0.003773
	Education	69	0.000082

MATHEMATICAL REPRESENTATION OF BASIC MODEL

A modified Leontief input-output model was used in this study of the Kansas economy. The components of the model were presented in schematic terms in the earlier portions of this chapter. This section develops the model in mathematical terms.

During a given period of time, an economy can be described as consisting of n-different industries. These industries produce their products, and at the same time, consume part of the products of each other. These relationships can then be expressed as a system of linear equations that describe the economy in balance.

Define the following variables as:

X; = total output of industry i

 X_{ij} = total amount of the product of industry i used up by industry j

 Y_i = total amount of X_i left over for final demand (consumption apart from that of other producing industries)

The balance equations are:

1.
$$X_i + M_i = Y_i + \Sigma_j X_{ij}$$
 (i = 1, 2...n) i.e., total supply equal total demand

flows in equation 1 are shown by equation 3, the input functions:

- 3. $X_{ij} = a_{ij} X_{j}$ since by definition $a_{ij} = {X_{ij} \choose X_{j}}$ (i,j = 1, 2...n) Substituting 3 into 2 yields:
- 4. X_i Σ_j a_{ij} X_j = Y_i M_i (i = 1, 2...n)
 Equation 4 represents a system of n-equations in n-unknowns X_j
 the levels of output; an n x n set of parameters a_{ij}, and two
 sets of variables (Y_i and M_i) that are given. Since the unknowns
 (X_j) are the output levels of each industry, equation 3 can be thought of as a simplified production function for the whole
 economy.

Imports are needed because domestic production cannot meet the total demand for all products. Imports of good i are, therefore, a function of the total supply of the <u>i</u>th commodity and, thus, are related to the level of domestic production of <u>i</u>th commodity. If the relationship is linear, then

- 5. $M_i = M_i X_i$ (i = 1...n) which leads to
- 6. $Y_i = X_i + M_i \Sigma_j \cdot a_{ij} \cdot X_j = X_i \cdot (1 + M_i) \Sigma_j \cdot a_{ij} \cdot X_j$ If imports are a small amount of the total supply such that $M_i = 0$ for all i, then
- 7. Y_i = X_i ∑_j a_{ij} X_j
 Equation 7 is a representation of the Leontief static inputoutput system. In this system the final demands (Y-vector) is
 considered to be determined by outside forces (i.e., the system
 itself does not determine the value of the Y-vector, for these
 are either given or predetermined). This is the feature that
 makes the system an open system.

The system described by equation 7 is formulated in terms of commodity flows. By adding employment, wage rates, and product prices, the system becomes more realistic. The variables that show these additions are

Z = total employment

$$Z_{j} = \text{employment in industry j}$$

$$b_{j} = \frac{Z_{j}}{X_{j}} = \text{amount of labor used by industry j to produce one}$$

$$\text{unit of its output}$$

 P_i = price of the <u>i</u>th product

W = wage rate (given)

By definition total employment is

8.
$$Z = \Sigma_j Z_j = \Sigma_j b_j X_j$$

and the equality of receipts and costs in the ith industry gives

9.
$$p_j X_j = \Sigma_i p_i X_{ij} + WZ_j = \Sigma_i p_i a_{ij} X_j + Wb_j X_j$$
hence

10.
$$p_j = \Sigma_i p_i a_{ij} + Wb_j$$

The set of equilibrium conditions are made up of

7.
$$Y_i = X_i - \Sigma_i a_{ij} X_i$$

8.
$$Z = \Sigma_i b_i X_i$$

10.
$$p_i = \Sigma_i p_i a_{ij} + Wb_j$$

The system shown by equation 7, 8 and 10 includes n outputs X_i , n prices p_i , and employment Z. There are 2 n + 1 equations in 2 n + 1 unknowns; hence, the system is consistent. Note also that none of the equations is derivable from the others. In fact there exist two separate subsystems within the entire system. If final demand (Y_i) is given then the equilibrium outputs (X_i) can

be determined from equation 7. These outputs then yield total employment from equation 8. Quite separately, the equilibrium prices (p_i) can be found from equation 10 for a given wage rate.

From equations 7 and 8 the transaction matrix can be constructed. Table 3-9 shows a typical representation of the transaction matrix when the data are in terms of commodity flows.

The transactions matrix shown in Table 3-9 is in terms of quantities, and the units vary from one row to another. The matrix can be summed across its rows to fit equations 7 and 8, but since the units vary, the matrix columns cannot be summed. For this reason, equation 10, the equality of receipts and costs, cannot be shown directly in Table 3-9. By adjusting the system shown by equations 7, 8 and 10 to account for money values, the entire system can be shown as a value transaction matrix.

With the equilibrium prices given (or determined), the money values of the commodities can be found. For the <u>i</u>th industry let

$$X_i = p_i X_i$$

$$X_{ij} = p_i X_{ij}$$

$$Y_i = p_i Y_i$$

For the given wage rate W, total labor payments are Z = WZ, and the values added in the separate industries are WZ_j . The transaction matrix is now of the form shown in Table 3-10.

For the system to be in equilibrium

$$X_{i} = X_{j} \quad i = j = 1, 2...n$$

must hold (i.e., the total gross outlay of each of the processing sectors must be the same as its respective total gross output).

Table 3-9
Interindustry Transactions, Input-Output Form

Industry Purchasing Industry Producing	Intermediate Demand = X ij	$W_i = \Sigma_j X_{ij}$	Final Demand = Y	Total Demand
Producing Sectors	$x_{11} x_{12} \dots x_{1j} \dots x_{1n}$ $x_{21} x_{22} \dots x_{2j} \dots x_{2n}$ \vdots	W ₁ W ₂ W _i W _n	Y 1 Y 2 : : Y i : Y n	X ₁ X ₂
U = Total Produced Inputs	Ս ₁ Ս ₂ Ս _j Ս _n			
Primary Inputs	z ₁ z ₂ z _j z _n		0*	Z
Total Production	x ₁ x ₂ x _j x _n		Υ	Х

^{*} Assumes that the final demand sectors do not use labor services, but the system can be modified to account for labor services in final demand by letting Z_j range from 1 to n + 1

Too, total final demand must equal total value added, i.e., Y = Z.

Table 3-10 shows only a column of final demand. Typically, this column includes consumer demand, investment demand, government demand, and exports. Similarly, the row of primary inputs usually includes labor requirements, capital consumption, government expenditures, and imports. Equilibrium requires that the sum of the columns of final demands be equal to the sum of the payments rows, but it is not necessary that a particular column total be equal to its corresponding row total (i.e., $Y_i = Z_j$ i = j = 1...n not necessary).

For each row in Table 3-10 there is an equation of the form $X_{i} = Y_{i} + \Sigma_{j} X_{ij}.$

The addition of all rows can now be shown as

11. $\Sigma_j X_i = \Sigma_i Y_i + \Sigma_i \Sigma_j X_{ij}$ Similarly, for each column the balance equation is $X_j = Z_j + \Sigma_i X_{ij}$, and addition for all columns gives

hence, equations 11 and 12 are equal to each other. This leads to n
13. $\sum_{i=1}^{n} Y_i = \sum_{j=1}^{n} Z_j$

Equation 13 states that final demand is equal to total factor payments. The equation is a general statement of the basic national accounting identity that states that gross national income (factor payments) is equivalent to gross national product (final

Table 3-10 $\label{lem:Value of Interindustry Transactions, Input-Output Form} % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form} \\ \end{array} \] % \[\begin{array}{c} \mathbf{Value of Interindustry Transactions, Input-Output Form, Input-Output Form, Input-Output Form, Input-Output Form, Input-Output Form, Input-Output Form, Input-Output F$

Industry Purchasing	Intermediate Demand = X ij	Final Demand = Y	Total Gross Output
Producing Sectors	<pre>X₁₁ X₁₂ X_{ij} X_{ln} X_{i1} X_{i2} X_{ij} X_{in}</pre>	Y 1 Y 2 Y i	X ₁ X ₂
Primary Inputs (Value Added)	z ₁ z ₂ z _j z _n	^Z _{n + 1}	Z
Total Gross Outlays	x ₁ x ₂ x _j x _n	Υ	X

demands). Thus, the transactions matrix of Table 2 shows gross national income as well as interindustry transactions.

The transactions matrix of Table 3-10 can be transformed into the matrix of input coefficients. This is done by dividing each entry of column j by the total gross output of industry j, i.e., $a_{ij} = {}^{X}_{ij}/X_{j}.$ From Table 3-10 a_{11} is derived by dividing X_{11} by X_{1} ; however, in reality X_{11} would be divided by the adjusted gross output of sector one, where adjusted gross output less inventory depletions.

Characteristics of the Input-Output Model

The system portrayed by Table 3-10 holds only if the following assumptions hold: 5

- 1. Each commodity or commodity group is supplied by only one industry or producing sector. This implies that there exists only one method of producing each group of commodities, and that each producing sector has only one primary output.
- 2. The inputs purchased by each producing sector depend only on the level of output of that sector. This is a variant of the linearity assumption which states that input functions are linear relationships. This also rules out substitution since it implies that there is only one way of producing a commodity.
- The total effect of engaging in several types of production is simply the sum of the separate effects.

Chenery, Hollis B. and Clark, Paul G., <u>Interindustry Economics</u> (New York: John Wiley & Sons, Inc., 1962), pp. 33-34.

The system shown by Table 3-10 is static, for the analysis is based on one point observations for a given period of time. Time, therefore, is not variable in this system. However, this system can easily be extended to comparative analysis by changing final demand. This feature makes the input-output model quite useful for projection purposes.

Projections from the Input-Output Model

In order to use the input-output model for projections of future interindustrial demands, it is necessary to assume that the input coefficients
remain constant over time. If in reality these coefficients are not
constant, then projections are not feasible since each time period requires
a different set of input functions. Clearly, the assumption of constant
input coefficients needs to be examined.

Two major factors indicate that input functions, hence, technical coefficients, are not invariant over time. First, technological changes alter the pattern of material inputs through the introduction of new products. Too, technological advance frequently phase some materials out of the production requirements (e.g. the introduction of the transistor in the production of electronic devices). However, since major technological advances are generally known in advance, the coefficients can be changed appropriately to show the effects of these changes.

Secondly, changes in the price levels of the inputs may lead to input substitution; thus, input requirements and technical coefficients will change if relative price levels are known, and if changes in price levels can be predicted, the coefficients can be altered to show price level changes. Whenever price levels vary only slightly or in proportion to one another, these variations will not significantly effect the technical coefficients.

Doubt is also cast on the constancy of technical coefficients by the existence of what Isard terms agglomeration economies, for these economies tend to change factor and material costs. Thus, the input functions that exist after these economies are realized can be quite different from those that existed prior to them. Since these economies are in the form of internal and external economies, their effect on technical coefficients is not readily handled.

For projection purposes, it is necessary to account for the above factors if the forecasts are to be of analytical value. Clearly, perfect projections are impossible, for by necessity, ours is a dynamic economic system which defies absolute projections. At the same time, however imperfect, they must be made.

Isard, Walter. Location and the Space Economy (Cambridge, Mass.: The MIT Press, 1962) Chap. 8.

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Chapter 4

DIVIDING UP THE STATE'S ECONOMY: INDUSTRIES AND SECTORS

The dissection of the Kansas economy into component parts attempts to lay bare functional relationships which allow a better understanding of the performance of the economy. The angle, depth, and frequency of the slicing operation is dictated by numerous considerations. The objectives of the study provide a guide for dividing the Kansas economy into industries and sectors. The extent of this division is limited by financial resources and the necessity to avoid disclosure of individual firm characteristics. But, within these constraints the maximum amount of disaggregation was sought.

The Kansas economy was divided into 69 processing sectors, eight final demand sectors, and six final payments sectors. The matrix, then, consists of 77 columns and 75 rows plus the "totals" row and column.

The sectoring scheme utilized the Standard Industrial Classification system for all industries except farming and maintenance and repair construction. Maintenance and repair construction is a "dummy" industry included to separate current expenditures from capital expenditures in the construction industry.

The farm sectors are classified on the basis of crop and livestock groups. Whereas other industries are constructed on an establishment basis (all of a firm's output is assigned to the industry of its primary output), farm sectors represent an allocation of the various outputs of the farms to the individual crop and livestock sectors.

The remaining portion of this chapter defines the industries and sectors

employed in the Kansas interindustry study.

Schematically, the broad sectoring is of the form presented in Figure 4-1. The largest portion of the matrix is the intermediate demand or processing sectors which include the first 69 rows and columns. Final payments sectors include rows 70 through 75 and final demand sectors include columns 70 through 77. The bottom right hand corner of the matrix shows the transactions between final payments and final demand sectors. Definitions of the components of all these sectors are presented below. The methodology, however, appears in a later chapter.

Figure 4-1
MAJOR COMPONENTS OF INPUT-OUTPUT TRANSACTIONS TABLE

	Sect	ors 1-69		
1-69	Intermediate Deman	d		
Sectors	Transactions of Industries Buying from or Selling to Other Industries			
	Rows Show Sales	Columns Show Purchases		

Sectors 70-77

Final Demand

Households Capital Formation Government Purchases Exports

70-75	Final Payments
Sectors	Households (Primary Wages & Salaries) Gross Savings (Returned Earnings & Degeneration) Taxes (Federal, State & Local) Imports (Out-of-State Purchases)

Final Demand-Final Payments

INDUSTRY AND SECTOR DEFINITIONS AND 1965 OUTPUT

FARMING

1.:	Corn - Farm value of corn produced on Kansas farms		(\$000's)
	Components		Output
	Corn (grain) Corn (silage) Total Sector Output	\$ \$	72,067 16,817 88,883
2.	Sorghum - Farm value of sorghum produced on Kansas farm	ıs	
	Components		Output
	Sorghum (grain) Sorghum (silage) Sorghum (forage) Total Sector Output	\$	131,242 33,541 13,827 178,610
3.	Wheat - Farm value of wheat produced on Kansas farms		
	Total Sector Output	\$	321,584
4.	Other Grains - Farm value of other grains produced on Kansas farms		
	Components		<u>Output</u>
	Oats Barley Rye Popcorn Broomcorn	\$	4,854 3,291 932 326 90
	Total Sector Output	\$	9,493
5.	Soybeans - Farm value of soybeans produced on Kansas fa	rm:	5
	Total Sector Output	\$	41,952
6.	Hay - Farm value of hay produced on Kansas farms		
	Total Sector Output	\$	122,590
7.	Dairy Products - Farm value of dairy products produced	on	Kansas farms
	Components		<u>Output</u>
	Milk Total Sector Output	\$ \$	72,316 72,316

8. Poultry and Poultry Products - Farm value of poultry and poultry products produced on Kansas farms

Components	<u>Output</u>
Chickens (including commercial broilers) Eggs Turkeys	\$ 1,765 18,466 2,560
Total Sector Output	\$ 22,791

9. Cattle - Farm value of cattle produced on Kansas farms

Total Sector Output \$ 596,977

10. Hogs - Farm value of hogs produced on Kansas farms

Total Sector Output \$ 100,852

11. Other Agricultural Products - Farm value of other agricultural products produced on Kansas farms

Components	<u>Output</u>
Vegetables	\$ 663
Sweet potatoes	794
Dry Edible beans	825
Strawberries	111
Peaches	432
Apples	529
Lespedeza seed	232
Red clover seed	337
Sweet clover seed	91
Alfalfa seed	2,024
Sugar beets	3,588
Wool (clipped)	1,471
Honey	570
Beeswax	29
Sheep	<u>7,711</u>
Total Sector Output	\$ 19,947

12. Agricultural Services - Includes establishments performing animal husbandry, horticultural, and other agricultural services. Some of these services are custom combining, aerial application of agricultural chemicals, farm management services, veterinary services, poultry hatchery services, etc. SIC 07

Total Industry Output

\$ 58,324

MINING

13. Crude Petroleum and Natural Gas - Includes establishments engaged in operating oil and gas field properties. SIC 1311

SIC Components	Output
1311-Crude petroleum and natural gas	\$ 441,761
Total Industry Output	\$ 441,761

14. Oil and Gas Field Services - Includes establishments engaged in drilling wells for oil or gas, establishments engaged in geophysical, geological and other exploration work. SIC 138

SIC Components	Output
138 - Oil and gas field services	\$ 46,443
Total Industry Output	\$ 46,443

15. Nonmetallic Mineral Mining, excluding Fuels - Includes mining of stone, sand, gravel, clays, chemical and fertilizer minerals. SIC 14

SIC Components	Output
147 - Chemical and fertilizer mineral mining	\$ 12,376 60,756
Total Industry Output	\$ 73,132

16. Other Mining - Includes mining of coal, metals, and other minerals not previously classified. SIC 10-12, 132

SIC Components	<u>Output</u>
 103 - Lead and zinc ores 12 - Bituminous coal and lignite mining 132 - Natural gas liquids	\$ 2,413 6,072 38,417 46,902

CONSTRUCTION

17. Maintenance and Repair - Includes expenditures by firms for maintenance and repair services on capital assets. These include painting, rewiring, etc. For further explanation of this "dummy" industry see the chapter on methodology.

Total Industry Output

\$ 166,039

18. Building Construction - General Contractors - Includes general contractors engaged in construction of residential, farm, industrial, public, and other buildings. SIC 15

Total Industry Output

\$ 367,289

19. Heavy Construction Other Than Building Construction - General Contractors - Includes general contractors engaged in the construction of highways and streets, bridges, sewers, railroads, etc. SIC 16

Total Industry Output

\$ 125,000

20. Special Trade Contractors - Includes contractors specializing in activities such as plumbing, painting, plastering, carpentering, etc. SIC 17

Total Industry Output

\$ 344,804

MANUFACTURING

21. Meat Products - Includes establishments processing, preparing and packing meat products. SIC 201

SIC Components	<u>Output</u>
2011 - Meat packing plants 2013 - Sausages and other prepared meat products 2015 - Poultry and small game dressing and packing,	\$ 548,893 10,565
wholesale Total Industry Output	31,180 \$ 590,639

22. Dairy Products - Includes establishments processing milk, cream, cheese, butter, etc. SIC 202

SIC Components	<u>Output</u>
2023 - Condensed and evaporated milk 2024 - Ice cream and frozen desserts 2026 - Fluid milk	\$ 8,486 5,695 98,530
Total Industry Output	\$112,711

23. Grain Mill Products - Includes establishments processing flour, cereal, feeds, etc. SIC 204

SIC Components	<u>Output</u>
2041 - Flour and other grain mill products	\$ 272,215
2042 - Prepared feeds for animals and fowls	58,830
2046 - Wet corn milling	2,683
Total Industry Output	\$ 333,728

24. Other Food and Kindred Products - Includes establishments producing or processing beverage products, bakery products, etc. SIC 203, 205, 206, 207-209

SIC Components	<u>Output</u>
203 - Canning and preserving fruits, vegetables and sea foods	\$ 6,577
205 - Bakery products	53,981
207 - Confectionery and related products	241
208 - Beverage industries	31,800
209 - Miscellaneous food preparations and kindred	
products	114,502
Total Industry Output	\$207,100

25. Apparel and Related Products - Includes establishments manufacturing apparel and other finished clothing and accessories and other fabricated textile products such as curtains, etc. SIC 23

SIC Components		<u>Output</u>
231 - Men's, youth's and boys' suits, coats and overcoats	\$	2,658
232 - Men's, youth's and boys' furnishings, work	·	, -
clothing and allied garments		11,553
233 - Women's, Misses' and Juniors' outerwear		12,498
236 - Girls', children's and infants outerwear		2,479
239 - Miscellaneous fabricated textile products		8,877
Total Industry Output	\$	38,066

26. Paper and Allied Products - Includes establishments manufacturing pulp from wood and other cellulose fibers, the manufacture of paper and paper products such as bags, boxes, envelopes, etc. SIC 26

SIC Components	0utput
263 - Paperboard mills	\$ 6,164
264 - Converted paper and paperboard products, except containers and boxes	15,008
265 - Paperboard containers and boxes	54,409
Total Industry Output	\$ 75,582

27. Printing and Publishing - Includes establishments engaged in printing by one or more of the common processes; establishments which perform services for the printing trade such as typesetting, etc. and establishments engaged in publishing newspapers, books, etc. SIC 27

<u>Output</u>
\$ 41,271
8,223
10,072
4,305
30,526
9,241
5,578
9,865
\$ 119,080
\$

28. Industrial Inorganic and Organic Chemicals - Includes establishments engaged in manufacturing basic industrial chemicals such as industrial gases, dyes, pigments, etc. SIC 281

SIC Components	<u>Output</u>
281 - Industrial inorganic and organic chemicals	\$ 153,654
Total Industry Output	\$ 153,654

29. Agricultural Chemicals - Includes establishments engaged in manufacturing fertilizers, agricultural pesticides, and other agricultural chemicals. SIC 287

SIC Components	<u>Output</u>
287 - Agricultural chemicals	\$ 16,605
Total Industry Output	\$ 16,605

30. Other Chemicals and Chemical Products - Includes establishments manufacturing unfinished plastics, drugs, cleaning preparations, perfumes, paints, explosives, glue, ink, etc. SIC 282-286, 289

57,650
10,883
25,230
12,547
23,587
29,897
1 2

31. Petroleum and Coal Products - Includes establishments processing and refining crude petroleum to produce gasoline, fuel oil, lubricants, etc. SIC 29

SIC Components	<u>Output</u>
 291 - Petroleum refining 295 - Paving and roofing materials 299 - Miscellaneous products of petroleum and coal Total Industry Output 	\$ 559,767 3,820 16,751 \$ 580,338

32. Rubber and Plastic Products - Includes establishments produing tires and tubes, rubber footwear, other fabricated rubber products, and miscellaneous finished plastic products. SIC 30

SIC Components	<u>Output</u>
301 - Tires and inner tubes 306 - Fabricated rubber products, not elsewhere	\$ 139,075
classified	2,472
307 - Miscellaneous plastics products	10,172
Total Industry Output	\$ 151,718

33. Cement, Concrete and Plaster Products - Includes establishments producing hydraulic cement, concrete, concrete products, lime, plaster, and plasterboard. SIC 324, 327

SIC Components	Output
324 - Cement, hydraulic 327 - Concrete, gypsum, and plaster products	\$ 27,053 49,115
Total Industry Output	\$ 76,168

34. Other Stone, Clay and Glass Products - Includes establishments producing glass and glass products, brick, pottery, asbestos products, etc. SIC 321-323, 325, 326, 328, 329

SIC Components	<u>Output</u>
323 - Glass products, made of purchased glass 325 - Structural clay products 328 - Cut stone and stone products 329 - Abrasive, asbestos, and miscellaneous non-	\$ 9,925 78,337 3,053
metallic mineral products Total Industry Output	\$ 5,228 96,544

35. Primary Metal Industries - Includes establishments engaged in the smelting of ferrous and nonferrous metals, and in the manufacture of castings, forgings and other basic metal products. SIC 33

SIC Components	<u>Output</u>
331 - Blast furnaces, steel works and rolling and finishing mills	\$ 648
332 - Iron and steel foundries	20,292
334 - Secondary smelting and refining of nonferrous metals and alloys	6,254
336 - Nonferrous foundries	3,574
339 - Miscellaneous primary metal industries	636
Total Industry Output	\$ 31,405

36. Fabricated Metal Products - Includes establishments producing metal sash and doors, boiler plate fabrication, sheet metal work, and other fabricated structural metal products. SIC 344

SIC Components	<u>Output</u>
3441 - Fabricated structural steel	\$ 29,068
3442 - Metal doors, sash, frames, molding and trim	17,101
3443 - Fabricated plate work (boiler shops)	7,881
3444 - Sheet metal work	10,246
3449 - Architectural and miscellaneous metal work	5,627
Total Industry Output	\$ 69,922

37. Other Fabricated Metal Products - Includes establishments producing metal cans, cutlery, hand tools, general hardware, non-electrical heating equipment, bolts, screws, rivets, washers, metal stampings, wire products, springs, valves, pipe and other light fabricated metal products. SIC 341-343, 345-349

SIC Components	<u>Output</u>
341 - Metal cans342 - Cutlery, hand tools and general hardware343 - Heating apparatus (except electric) and	\$ 533 3,918
plumbing fixtures	52,052
345 - Screw machine products and bolts, nuts,	
screws, rivets and washers	1,531
346 - Metal stampings	1,133
347 - Coating, engraving and allied services	2,394
348 - Miscellaneous fabricated wire products	6,545
349 - Miscellaneous fabricated metal products	6,950
Total Industry Output	\$ 75,057

38. Farm Machinery and Equipment - Includes establishments manufacturing tractors and other equipment for use on the farm. SIC 352

SIC Components	<u>Output</u>
352 - Farm machinery and equipment Total Industry Output	\$ 51,621 \$ 51,621

39. Construction Machinery and Like Equipment - Includes establishments engaged in manufacturing heavy machinery and equipment used by the construction and mining industries such as bulldozers, cranes, power shovels, well drilling equipment, mineral cleaning equipment, and mine cars. SIC 353

SIC Components	<u>Output</u>
3531 - Construction machinery and equipment 3532 - Mining machinery and equipment, except	\$ 15,523
oil field machinery and equipment	6,466
3533 - Oil field machinery and equipment	11,001
3534 - Elevators and moving stairways	239
3535 - Conveyors and conveying equipment	14,609
Total Industry Output	\$ 47,839

40. Food Products Machinery and Other Special Industry Machinery - Includes establishments manufacturing feed mill equipment, flour mill equipment, power saws and chain saws, printing equipment, etc. SIC 355

SIC Components	<u>Output</u>
3551 - Food products machinery 3555 - Printing trades machinery and equipment	\$ 15,704 11,065
Total Industry Output	\$ 26,770

41. Electrical Machinery - Includes establishments manufacturing apparatus and supplies for the generation, storage, transmission, transformation, and utilization of electrical energy. The manufacture of household appliances is also included in this group. SIC 36

SIC Components	<u>Output</u>
361 - Electric transmission and distribution equipment \$	289
362 - Electrical Industrial apparatus	1,125
363 - Household appliances	489
364 - Electric lighting and wiring equipment	2,980
365 - Radio and television receiving sets, except	
communication types	411
366 - Communication equipment	6,209
367 - Electronic components and accessories	13,832
369 - Miscellaneous electrical machinery, equipment,	
and supplies	19,445
Total Industry Output \$	43,367

42. Other Machinery - Includes establishments manufacturing engines and turbines, machine tools, special dies and tools, computing and accounting machines, etc. SIC 351, 354, 356-359

SIC Components	<u>Output</u>
354 - Metal working machinery and equipment	\$ 5,789
356 - General industrial machinery and equipment	36,681
357 - Office, computing, and accounting machines	369
358 - Service industry machines	31,973
359 - Miscellaneous machinery, except electrical	52, 42 0
Total Industry Output	\$ 127,232

43. Motor Vehicles and Equipment - Includes establishments manufacturing or assembling motor vehicles, passenger cars, truck and bus bodies, truck trailers, and parts for motor vehicles. SIC 371

SIC Components	<u>Output</u>
3711 - Motor Vehicles	\$ 204,593
3713 - Truck and bus bodies	8,579
3714 - Motor vehicle parts and accessories	1,833
3715 - Truck Trailers	7,240
Total Industry Output	\$ 223,244

44. Aerospace - Includes establishments manufacturing or assembling complete aircraft, missiles, or space vehicles, and parts for such vehicles. SIC 372

SIC Components	<u>Output</u>
<pre>3721 - Aircraft 3722 - Aircraft engines and engine parts</pre>	\$ 551,382 5,336

44. Aerospace - Continued

SIC Components	<u>Output</u>
3729 - Aircraft parts and auxiliary equipment, not	
elsewhere classified	\$ 4,416
Total Industry Output	\$ 561,134

45. Trailer Coaches - Includes establishments manufacturing trailer coaches (mobile homes). Also included is the manufacture of pickup campers and camping trailers. SIC 3791

SIC Components	Output
3791 - Trailer coaches	\$ 42,313
Total Industry Output	\$ 42,313

46. Other Transportation Equipment - Includes establishments manufacturing transportation equipment not elsewhere classified, including boats, motorcycles, bicycles, and parts. SIC 373, 375, 3799

SIC Components	<u>Output</u>
373 374 - Ship and boat building and repairing railroad equipment 3799 - Transportation equipment, not elsewhere	\$ 33,618
classified Total Industry Output	\$ 10,726

47. Other Manufacturing - Includes establishments manufacturing goods not elsewhere classified such as textile mill products, lumber and wood products, furniture and fixtures, leather and leather products, scientific instruments, photographic goods, office supplies, etc. SIC 21, 22, 24, 25, 31, 38

SIC Components	<u>Output</u>
22 - Textile mill products 24 - Lumber and wood products, except furniture 25 - Furniture and fixtures 31 - Leather and leather products	\$ 324 15,893 24,025 1,809
 38 - Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks 39 - Miscellaneous manufacturing industry Total Industry Output 	\$ 5,528 11,861 59,440

TRANSPORTATION

48. Railroad Transportation - Includes railroads, sleeping car and other passenger services, railway express. SIC 40

SIC Components	<u>Output</u>
40 - Railroad transportation	\$ 249,891
Total Industry Output	\$ 249,891

49. Motor Freight Transportation - Includes establishments furnishing local or long distance trucking service, and warehousing services. SIC 42

SIC Components	<u>Output</u>
42 - Motor freight transportation and warehousing Total Industry Output	\$\frac{137,443}{137,443}

50. Water Transportation, Air Transportation, Pipeline Transportation, and Other Transportation Agencies and Services - Includes firms engaged in transporting goods and persons on rivers or canals, local water transportation, and services incidental to water transport; air transportation on certified and uncertified carriers, and fixed facilities and services related to air transport; firms primarily engaged in the pipeline transportation of petroleum (the pipeline transmission of natural gas is included in Sector 56); firms engaged in supplying local and interurban passenger transportation such as taxicabs, city bus lines, intercity bus lines as well as firms furnishing services incidental to transportation such as freight forwarding, packing and crating services, rental of transportation equipment, and stockyard operation. SIC 41, 44, 45, 46, 47

SIC Components	<u>Output</u>
Local and suburban transit and interurban passenger transportation - water trans- portation - transportation by air - pipeline transportation - transportation services 47	\$ 36,705
Total Industry Output	\$ 36,705

UTILITIES

51. Communication - Includes establishments engaged in telephone, telegraph, radio, television, and other communication services. SIC 48

SIC Components	Output
481 - Telephone communication (wire or radio) 482 - Telegraph communication (wire or radio)	\$ 131,088
483 - Radio broadcasting and television	13,279
489 - Communication services, not elsewhere classified	15,881
Total Industry Output	\$ 160,452

52. Electric Gas and Sanitary Services - Includes firms engaged in supplying electricity, natural gas and other gas products, water, garbage collection, and other sanitation services. SIC 49

SIC Components	<u>Output</u>
491 4931 > Electric companies and systems - electric and other services combined	\$ 161,834
492 Gas companies and systems - gas and other services combined	112,327
494 - Water supply	455
495 - Sanitary services	10,357
Total Industry Output	$$\frac{284,973}{}$

WHOLESALE TRADE

53. Groceries and Related Products - Includes firms engaged in the wholesale distribution of groceries and related products. SIC 504

SIC Components	<u>Output</u>
504 - Groceries and related products Total Industry Output	\$ 45,571 \$ 45,571

Farm Products-Raw Materials - Includes firms engaged in the wholesale distribution of farm product raw materials, most of which are used in manufacturing industries. SIC 505

SIC Components	<u>Output</u>
505 - Farm products-raw materials Total Industry Output	\$ 81,304 \$ 81,304

55. Machinery, Equipment and Supplies - Includes establishments that wholesale commercial and industrial machinery, equipment and supplies, farm machinery and equipment, professional equipment and supplies (used by dentists, surgeons and like professional groups), equipment and supplies for service establishments (barber shops, laundries, dry cleaning plants and related services). SIC 508

SIC Components	<u>Output</u>
508 - Machinery, equipment and supplies Total Industry Output	\$ <u>82,567</u> \$ 82,567

56. Other Wholesale Trade - Includes wholesalers of motor vehicles and equipment, drugs, dry goods, electrical goods, hardware, and other wholesale trade. SIC 501-503, 506, 507, 509

SIC Components	<u>Output</u>
Motor vehicles and automotive equipment - drugs, chemicals and allied products - dry goods and apparel - electrical goods - hardware, and plumbing and heating equip- ment and supplies - machinery, equipment, and supplies Total Industry Output	\$ 126,731 \$ 126,731

RETAIL TRADE

57. Farm Equipment Dealers - Includes firms engaged in the retail sale of farm equipment, machinery, and farm production supplies. SIC 5252

SIC Components	<u>Output</u>
5252 - Farm equipment dealers	\$ 30,384
Total Industry Output	\$ 30.384

58. Gasoline Service Stations - Includes firms primarily engaged in the retail sale of gasoline and lubricating oils. SIC 554

SIC Components	<u>Output</u>
554 - Gasoline service stations Total Industry Output	\$ <u>74,312</u> \$ <u>74,312</u>

59. Eating and Drinking Places - Includes establishments selling prepared foods and drinks for consumption on the premises. SIC 58

SIC Components	<u>Output</u>
58 - Retail tradeeating and drinking places	\$ <u>173,890</u>
Total Industry Output	\$ 173,890

60. Other Retail Trade - Includes retailers of building materials, general merchandise such as department stores, food, motor vehicles, clothing, furniture, drugs, and other retail trade. SIC 52 (except 5252), 53, 54, 55 (except 554), 56, 57, 59

SIC Components	<u>Output</u>
5251 - Hardware stores 53 - Retail trade - general merchandise 54 - Retail trade - food 55 (except 554) - Automotive dealers and gasoline service stations	\$ 419,530
56 - Retail trade - apparel and accessories 57 - Retail trade - furniture, home furnishings and equipment	
59 - Retail trade - miscellaneous retail stores Total Industry Output	\$ 419,530

FINANCE, INSURANCE AND REAL ESTATE

61. Banking - Includes institutions engaged in deposit banking or closely related functions including trust activities. SIC 60

SIC Components	<u>Output</u>
60 - Banking	\$ <u>166,654</u>
Total Industry Output	\$ <u>166,654</u>

62. Other Financial Institutions - Includes credit and lending institutions other than banks, security and commodity dealers, investment companies, and other establishments extending financial services. SIC 61, 62, 67

SIC Components	<u>Output</u>
61 Credit agencies other than banks - security 62 and commodity brokers, dealers, exchanges, 67 and services - holding and other investment	\$ 315,940
companies	
Total Industry Output	\$ 315,940

63. Insurance and Real Estate - Includes insurance carriers (companies), agents, and insurance services. This group also includes real estate operators, agents and other real estate services. SIC 63-66

SIC Components	<u>Output</u>
Insurance carriers - insurance agents, brokers, and service - combinations of real estate, insurance, loans, law offices	\$ 299,619
65 (exclude SIC 656)-Real Estate Total Industry Output	$95,273$ \$\frac{95,273}{394,892}

SERVICES

64. Lodging Services - Includes firms operating hotels, tourist courts, and motels. This group excludes trailer parks. SIC 701, 702, 703 (excluding 7031)

SIC Components	<u>Output</u>
70 - (exclude 7031)-Hotels, rooming houses, camps, and other lodging places Total Industry Output	\$ <u>34,298</u> \$ 34,298

65. Personal Services - Includes establishments providing repair, laundry, photographic, entertainment, and other personal services predominantly to private individuals. SIC 72, 75, 76, 78, 79, 84

SIC Components	<u>Output</u>
 72 - Personal services 75 - Automobile repair, auto services, and garages 76 - Miscellaneous repair services 78 - Motion pictures 79 - Amusement and recreation services, except 	\$ 93,005 61,903 37,159 13,817
motion pictures Total Industry Output	\$ $\frac{33,033}{238,917}$

66. Business Services - Includes establishments providing advertising, credit, collectional, janitorial and stenographic services. SIC 73 (excluding 7391)

SIC Components	<u>Output</u>
736 - Private employment agencies 73 - (except 7391)-Miscellaneous business services	\$ 154 43.554
Total Industry Output	\$ 43,708

67. Medical and Other Health Services - Includes establishments engaged in furnishing medical, surgical, and other health services primarily to private individuals. SIC 80

SIC Components	Output
80 - Medical and other health services	\$ 301,090
Total Industry Output	\$ 301,090

68. Other Services - Includes establishments providing trailer park services, legal services and other miscellaneous services. SIC 7031, 81, 86, 88, 89 (excluding 8921)

SIC Components	<u>Output</u>
495 - (except 4952)-Sanitary services 7031- Trailer parks	\$ 331 1,057

68. Other Services - Continued

SIC Components	<u>Output</u>
7391 - Research, development, and testing	
laboratories	\$ 1,510
81 - Legal services	9,665
86 - Nonprofit membership organizations	37,810
89 - Miscellaneous services	30,351
Total Industry Output	\$ 80,723

69. Education - Includes both public and privately provided educational services such as elementary and secondary schools, colleges and universities, commercial and trade schools, and other educational services. SIC 82, 9282, 9382

SIC Components	<u>Output</u>
82 - Educational services	\$ 541,826
Total Industry Output	\$ 541,826

311		*		

Chapter 5

INTERINDUSTRY RELATIONS OF THE KANSAS ECONOMY

"Production recipes" was the label attached to the information contained in the columns of the input-output tables. The columns indicate input requirements for industries to produce their output. Each of these columns provides a substantial amount of information on the production structure of a Kansas industry.

A major portion of the output of numerous Kansas industries is sold to other Kansas industries as an input in their production process. This type of market is referred to as intermediate demand since the markets are for goods and services to be used in further production. For all Kansas industries \$11.5 billion of their total market is with other Kansas industries. The purpose of this chapter is to sketch the major characteristics of the interindustry relations of the Kansas economy; both an investigation of the products and services that Kansas industries buy from other Kansas industries as well as the sales by Kansas industries to other state industries.

Interindustry Purchases

The quantity of total inputs purchased from other Kansas industries has wide variability among industries. As Table 5-1 shows, the per cent of total purchases by Kansas industries from other Kansas industries ranges from a high of nearly 80 per cent in meat products manufacturing to a low of slightly more than one per cent for other transportation equipment and manufacturing.

Of the 22 sectors with the highest ratios, 13 are farm or farm related.

The relatively high dependence of these sectors on other sectors in the state's economy is a result of at least two characteristics of agriculture. First, Kansas agriculture has become highly specialized with the result that more inputs are purchased off the farm. Second, farm and agribusiness enterprises have been historically important. Consequently, industries supply inputs to farm and agribusiness firms have had sufficient time to develop in response to these markets. In newer industries sufficient time may not have elapsed for supplying industries to locate in the state, or the industry may be of inadequate size to attract supplying firms into the state.

As was discussed in Chapter 1, industries often tend to develop in families in that they are linked to one another by providing inputs or utilizing outputs. This is one relationship which explains the wide variation in the ratios of Table 5-1. While some industries purchase most of their inputs from other Kansas industries, other obtain almost all of their commodity and service requirements from outside the state. Of the 68^{*} industries listed, 12 purchase less than 10 per cent of their inputs from Kansas industries.

The ratios in Table 5-1 provide a partial measure of the impact that each Kansas industry has on other Kansas industries. The greater the instate purchases, the larger tends to be the effect on other state industries. As was explained in Chapter 3, this is only a partial measure.

Figures 5-1 through 69 present the distribution of major purchases for each industry. All purchases are included, not just purchases from other

^{*}Maintenance and Repair Construction was excluded because it was a "dummy" industry. See Chapter 4 for an explanation.

industries as in Table 5. Imports are represented by "M." All other abbreviations are standard.

Interindustry Sales

Sales by Kansas industries to other Kansas industries are presented in Table 5-2. The largest dollar volume of sales to other Kansas industries is by the cattle sector. Of the \$439 million cattle sales to other Kansas industries, \$315 million is to Meat Products manufacturing. Crude Oil and Natural Gas has the second highest interindustry sales with \$339 million followed by Special Trade Construction with \$333 million.

In addition to reflecting the size variations among industries, the differences in the volume of sales by Kansas industries to other Kansas industries occur because of linkage and stage of production differences.

Many industries sell most of their output to industries outside of the state for further processing. Others produce a final product or service that is sold to consumers, not industries.

Table 5-1

RANKED RATIOS OF TOTAL PURCHASES BY KANSAS INDUSTRIES
FROM OTHER KANSAS INDUSTRIES

Rank	Sector	Percent
1	Meat Products	79.91
2	Cattle	66.68
3	Hogs	64.50
4	Dairy Products (Farming)	63.83
5	Dairy Products (Manufacturing)	62.40
6	Petroleum and Coal Products	58.28
7	Building Construction	56.49
8	Grain Mill Products	55.12
9	Other Mining	47.36
10	Nonmetallic Mining	42.93
11	Other Agricultural Products	40.36
12	Electric Gas and Sanitary Services	40.19
13	Farm Products (Wholesale)	37.61
14	Heavy Construction	36.33
15	Crude Oil and Natural Gas	35.54
16	Poultry and Poultry Products	35.46
17	Gasoline Service Stations	34.68
18	Oil and Gas Field Services	32.39
19	Other Grains	32.15
20	Agricultural Services	32.12
21	Farm Equipment Dealers	32.03
22	Other Food and Kindred Products	31.51

Rank	Sector	Percent
23	Business Services	29.87
24	Lodging Services	29.45
25	Machinery and Equipment	29.23
26	Communications	29.00
27	Eating and Drinking	27.81
28	Wheat	26.88
29	Cement and Concrete	26.75
30	Insurance and Real Estate	26.42
31	Other Retail Trade	25.88
32	Soybeans	25.39
33	Sorghum	23.22
34	Groceries	23.05
35	Trailer Coaches	21.10
36	Other Services	20.12
37	Corn	19.94
38	Education	17.96
39	Special Trade Construction	17.80
40	Нау	17.15
41	Other Chemicals	17.14
42	Personal Services	17.13
43	Other Transportation	17.07
44	Construction Machinery	16.98
45	Farm Machinery	16.59

Rank	Sector	Percent
46	Banking	16.37
47	Medical and Health Services	16.27
48	Industrial Chemicals	16.20
49	Paper and Allied Products	14.05
50	Agricultural Chemicals	13.82
51	Other Finance	13.40
52	Other Manufacturing	12.68
53	Other Wholesale Trade	11.54
54	Railroad Transportation	11.22
55	Motor Freight	10.70
56	Other Fabricated Metal Products	10.43
57	Other Stone and Clay	9.45
58	Electrical Machinery	9.23
59	Food Products Machinery	9.21
60	Primary Metals	9.08
61	Printing and Publishing	8.97
62	Motor Vehicles	7.54
63	Aerospace	7.46
64	Fabricated Metals	7.11
65	Other Machinery	6.24
66	Rubber and Plastics	5.81
67	Appare1	3.04
68	Other Transportation Equipment	1.24

Table 5-2

SALES BY KANSAS INDUSTRIES TO KANSAS INDUSTRIES (thousands of dollars)

	Industry	Sales to Kansas Industries
1	Corn	49,768
2	Sorghum	107,015
3	Wheat	122,432
4	Other Grains	971
5	Soybeans	33,996
6	Нау	106,811
7	Dairy Products	62,086
8	Poultry and Poultry Products	8,889
9	Cattle	439,388
10	Hogs	86,063
11	Other Agricultural Products	12,395
12	Agricultural Services	54,458
13	Crude Oil and Natural Gas	339,105
14	Oil and Gas Field Services	46,443
15	Nonmetallic Mining	10,953
16	Other Mining	24,299
17	Maintenance and Repair	81,972
18	Building Construction	2,936
19	Heavy Construction	6,643
20	Special Trade Construction	332,919
21	Meat Products	52,701
22	Dairy Products	16,098

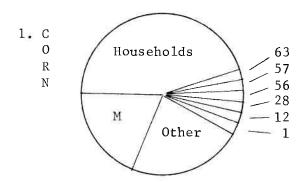
	Industry	Sales to Kansas Industries
23	Grain Mill Products	86,364
24	Other Food and Kindred Products	37,262
25	Appare1	3,171
26	Paper and Allied Products	30,135
27	Printing and Publishing	45,525
28	Industrial Chemicals	40,604
29	Agricultural Chemicals	7,507
30	Other Chemicals	37,297
31	Petroleum and Coal Products	63,328
32	Rubber and Plastics	9,302
33	Cement and Concrete	41,902
34	Other Stone and Clay	15,976
35	Primary Metals	15,994
36	Fabricated Metals	20,566
37	Other Fabricated Metal Products	22,538
38	Farm Machinery	16,637
3 9	Construction Machinery	4,918
40	Food Products Machinery	6,074
41	Electrical Machinery	10,281
42	Other Machinery	27,430
43	Motor Vehicles	694
44	Aerospace	4,231
45	Trailer Coaches	3,994
46	Other Transportation Equipment	1,949

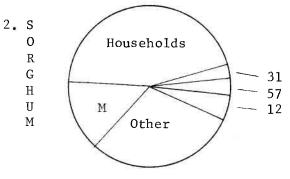
	Industry	Sales to Kansas Industries
47	Other Manufacturing	19,113
48	Railroad Transportation	60,202
49	Motor Freight	56,641
50	Other Transportation	14,604
51	Communications	94,045
52	Electric, Gas and Sanitary Services	160,860
53	Groceries	33,766
54	Farm Products	47,951
55	Machinery and Equipment	67,479
56	Other Wholesale Trade	120,823
57	Farm Equipment Dealers	27,125
58	Gasoline Service Stations	17,443
59	Eating and Drinking	10,692
60	Other Retail Trade	15,822
61	Banking	58,120
62	Other Finance	15,064
63	Insurance and Real Estate	140,805
64	Lodging Services	12,554
65	Personal Services	42,692
66	Business Services	33,728
67	Medical and Health Services	17,410
68	Other Services	53,319
69	Education	22,077

Figure 5

1 thru 69

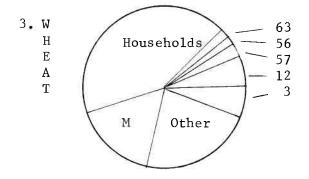
MAJOR INPUTS OF KANSAS INDUSTRIES

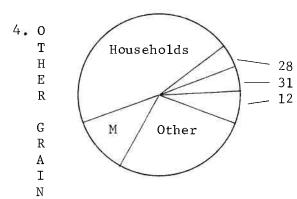




- 1 Corn
- 12 Agricultural Services
- 28 Industrial Chemicals
- 56 Other Wholesale Trade
- 57 Farm Equipment Dealers
- 63 Insurance & Real Estate

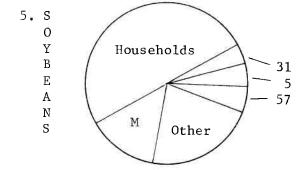
- 12 Agricultural Services
 57 Farm Equipment Dealers
- 31 Petroleum & Coal Products

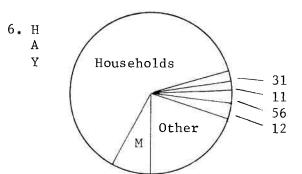




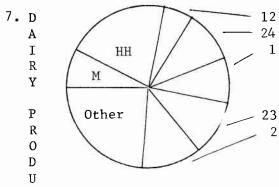
- 3 Wheat
- 12 Agricultural Services
- 57 Farm Equipment Dealers
- 56 Other Wholesale Trade
- 63 Insurance

- 12 Agricultural Services 31 Petroleum & Coal Products
- 28 Industrial Chemicals





- 57 Farm Equipment Dealers
- 5 Soybeans
- 31 Petroleum & Coal Products
- 12 Agricultural Services
- 56 Other Wholesale Trade
- 11 Other Agricultural Products
- 31 Petroleum & Coal Products



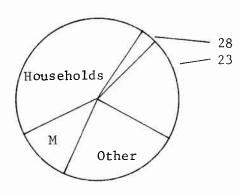
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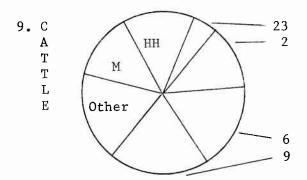
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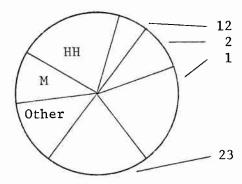


- C 2 Sorghum
- T 23 Grain Mill Products
- S 1 Corn
 - 24 Other Food & Kindred Products
 - 12 Agricultural Services

23 Grain Mill Products28 Industrial Chemicals

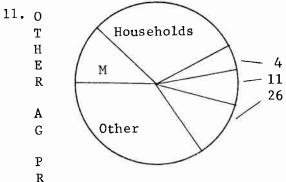






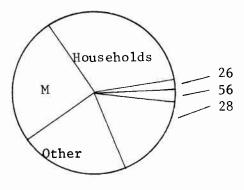
- 9 Cattle
- 6 Hay
- 2 Sorghum
- 23 Grain Mill Products

- 23 Grain Mill Products
 - 1 Corn
 - 2 Sorghum
- 12 Agricultural Services



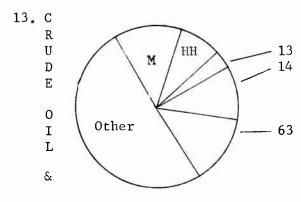
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- O 26 Paper & Allied Products
- D 11 Other Agricultural Products
 - 4 Other Grains

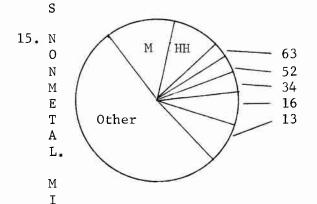
- 28 Industrial Chemicals
- 56 Other Wholesale Trade
- 26 Paper & Allied Products



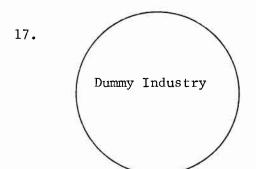
Ν 63 Insurance & Real Estate Α 14 Oil & Gas Field Services Τ. 13 Crude Oil & Natural Gas

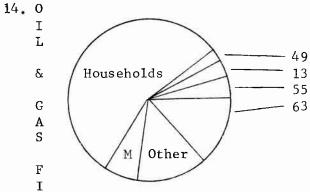
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- 13 Crude Oil & Natural Gas Ν 16 Other Mining Ι
- 34 Other Stone & Clay N
- G 52 Electric, Gas, & Sanitary
 - 63 Insurance & Real Estate



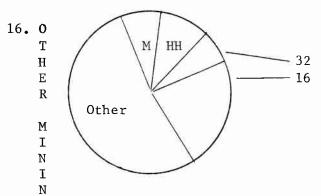


- 63 Insurance & Real Estate 55 Machinery & Equipment
- D 13 Crude Oil & Natural Gas 49 Motor Freight

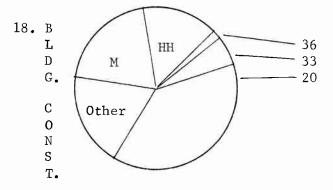
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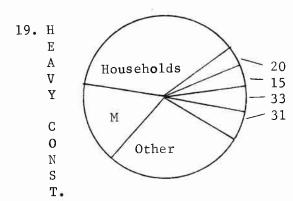
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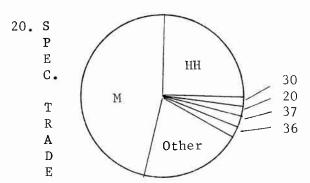
16 Other Mining 32 Rubber & Plastics



- 20 Special Trade Construction
- 33 Cement & Concrete
- 36 Fabricated Metals



- 31 Petroleum & Coal Products
- 33 Cement & Concrete
- 15 Nonmetallic Mining
- 20 Special Trade Construction

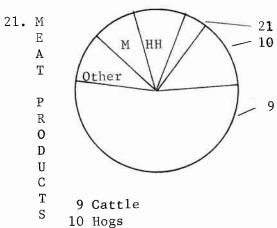


- 36 Fabricated Metals
- 37 Other Fabricated Metal Prod.
 - 20 Special Trade Construction
- S 30 Other Chemicals T_{\bullet}

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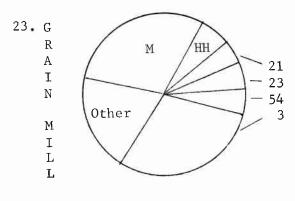
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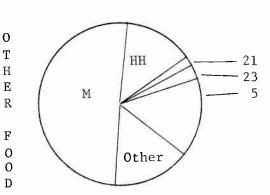


21 Meat Products

- 22. D Α Μ Ι HH - 26 Other R - 22 Y 7 Ρ R 0 D U
 - С 7 Dairies Τ 22 Dairy Products S
 - 26 Paper & Allied Products



- Ρ 3 Wheat
- R 54 Farm Products (Whlse.)
- 0 23 Grain Mill Products
 - 21 Meat Products

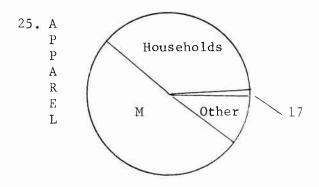


- 5 Soybeans
- R 23 Grain Mill Products 0
 - 21 Meat Products

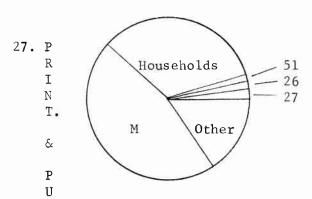
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- 17 Maintenance & Repair
- 55 Machinery & Equipment
- 51 Communication



- 27 Printing & Publishing 26 Paper & Allied Products
- 51 Communications

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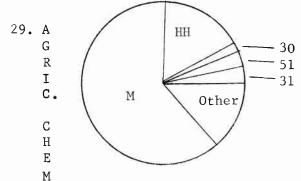
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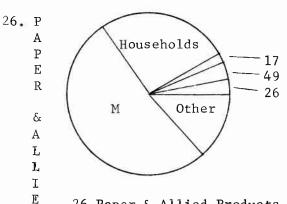
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- 31 Petroleum & Coal Products
- 51 Communications
 - 30 Other Chemicals



- 26 Paper & Allied Products
- 49 Motor Freight

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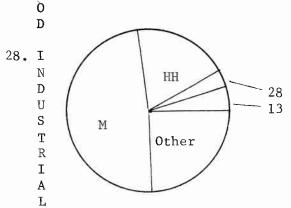
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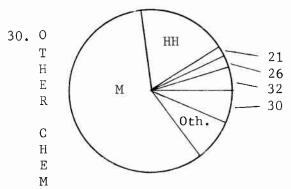
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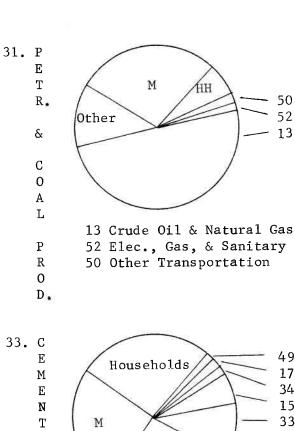
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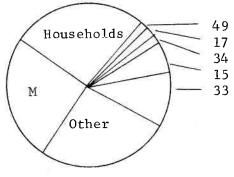


- 13 Crude Oil & Natural Gas 28 Industrial Chemicals
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- 30 Other Chemicals
 - 32 Rubber & Plastics
 - 26 Paper & Allied Products
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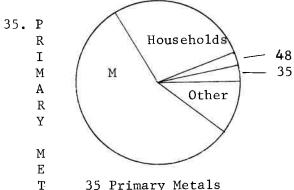
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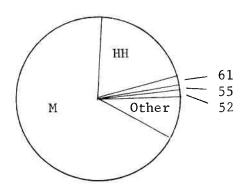
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33 Cement & Concrete 15 Nonmetallic Mining 34 Other Stone & Clay 17 Maintenance & Repair 49 Motor Freight



35 Primary Metals 48 Railroad Transportation



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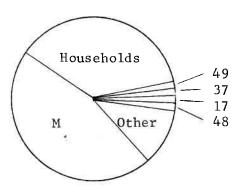
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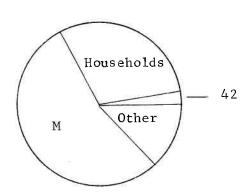
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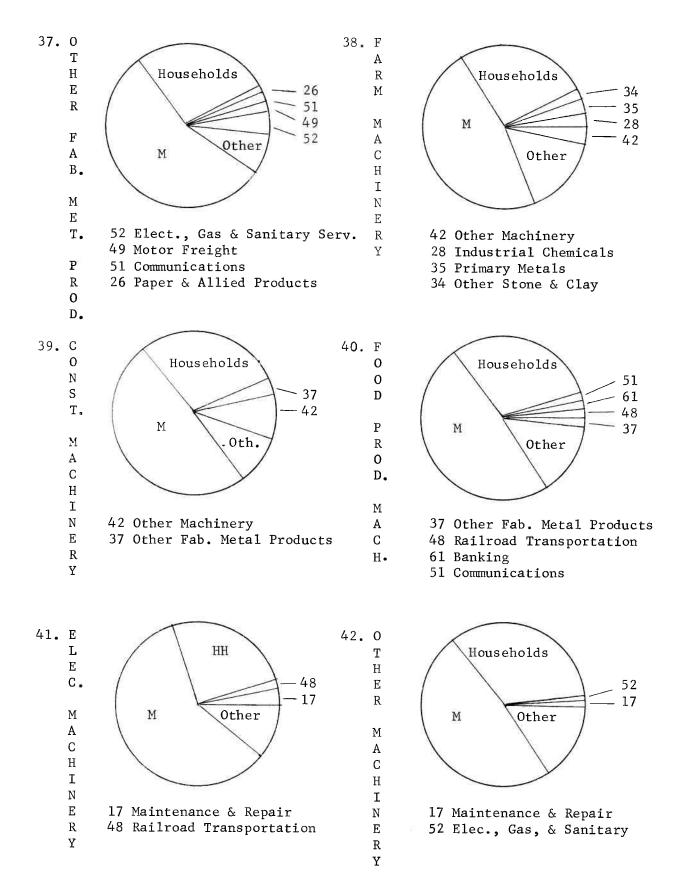
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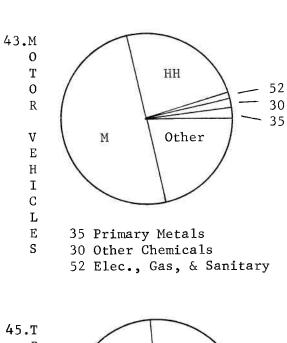


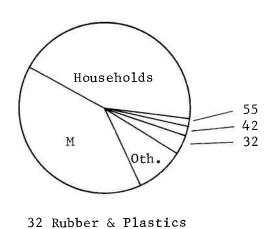
- 48 Railroad Transportation 17 Maintenance & Repair 37 Other Fabric. Metal Prods.
- 49 Motor Freight



42 Other Machinery

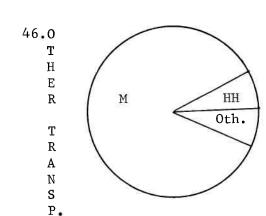






42 Other Machinery

55 Machinery & Equipment



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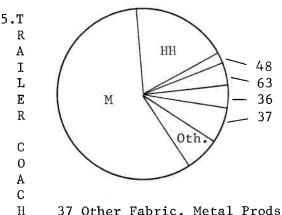
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- 37 Other Fabric. Metal Prods. 36 Fabricated Metals
- 63 Insurance & Real Estate

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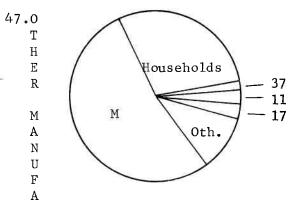
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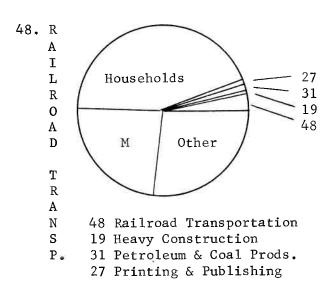
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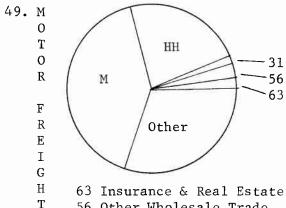
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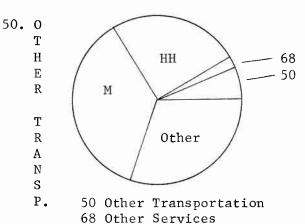
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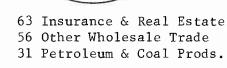


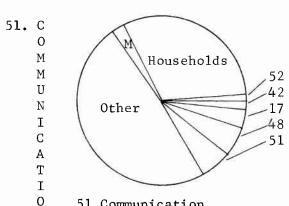
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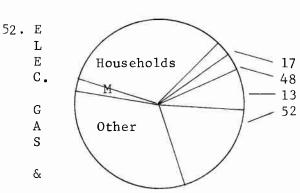


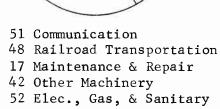


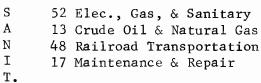


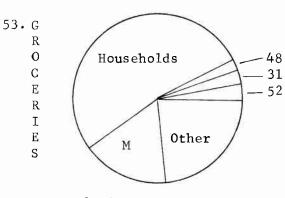


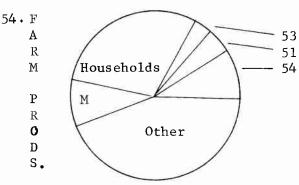










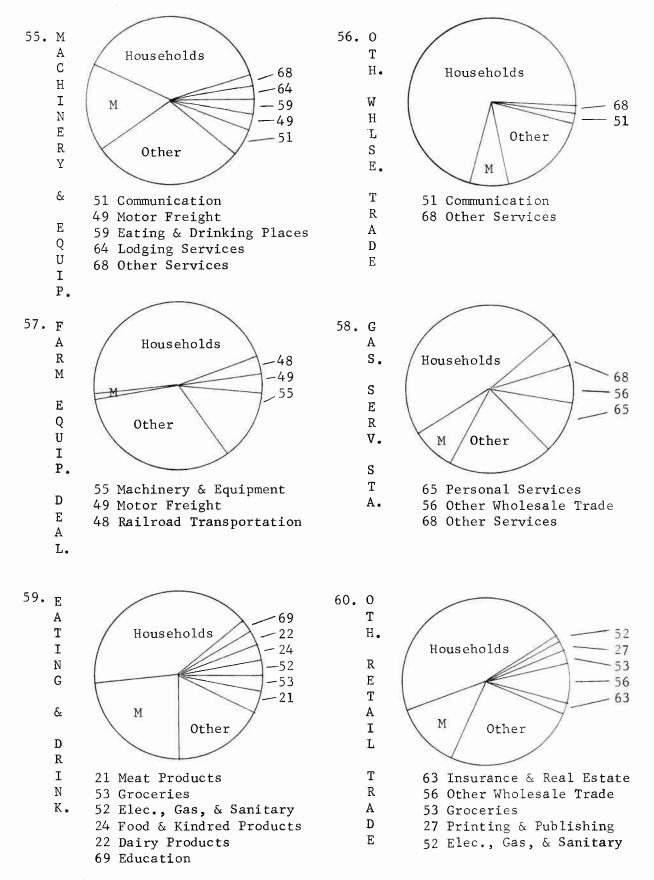


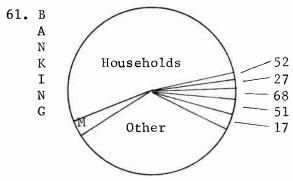
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- 54 Farm Products (Whlse.) 51 Communications 53 Groceries & Related Prods.

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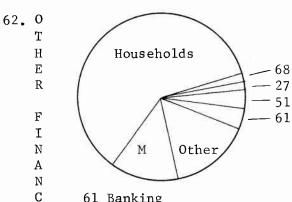
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- 17 Maintenance & Repair
- 51 Communications
- 68 Other Services
- 27 Printing & Publishing
- 52 Elec., Gas, & Sanitary



61 Banking

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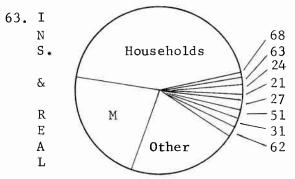
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- 51 Communications
- 27 Printing & Publishing
- 68 Other Services



- 68 Other Services 62 Other Finance Ε
- S 31 Petroleum & Coal Prods.
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- 21 Meat Products \mathbf{T}

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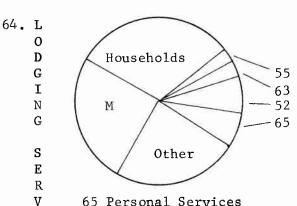
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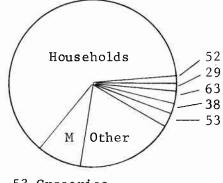
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- 24 Food & Kindred Products
- 63 Insurance & Real Estate



- 65 Personal Services
- 52 Elec., Gas, & Sanitary
- 63 Insurance & Real Estate
- 55 Machinery & Equipment



- 53 Groceries
- 38 Farm Machinery
- 63 Insurance & Real Estate
- С 29 Agricultural Chemicals Ε 52 Elec., Gas, & Sanitary

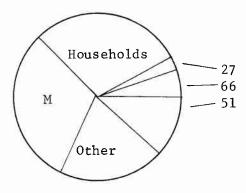
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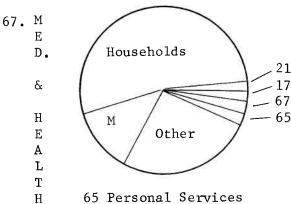
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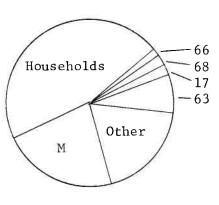


- 51 Communications
- 66 Business Services
 - 27 Printing & Publishing



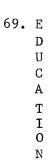
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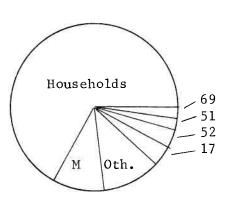


- 65 Personal Services
- 67 Medical & Health Serv.
- S 17 Maintenance & Repair
 - 21 Meat Products

- 63 Insurance & Real Estate
- 17 Maintenance & Repair
- 21 Meat Products
- 67 Medical & Health Services



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- 17 Maintenance & Repair
- 52 Elec., Gas, & Sanitary
- 51 Communications
- 69 Education

Chapter 6

FINAL PAYMENTS CHARACTERISTICS

Final payments sectors represent expenditure categories of industries other than purchases of goods and services from Kansas industries. These include Households (wages, salaries, interest, profit, and rent), Gross Savings (retained earnings and depreciation), Federal Government (primarily taxes), State Government, Local Government, and Imports (out-of-state purchases).

Households

Payments to households, primarily wages, represent the labor input into the production process. Table 6-1 summarizes the percentage that payments to households represents of total inputs. Payments to households exceed 50 per cent to total inputs for nine of the industries and are more than 30 per cent for 37 of the 69 industries.

The total of the household row represents total personal income of Kansas residents. This corresponds to the U. S. Department of Commerce definition of personal income. In 1965 Kansas personal income totaled \$6,001,000,000.

The most striking characteristic of Kansas personal income is that more than \$1 billion was paid to Kansas residents by business firms outside the state of Kansas and an additional \$675 million was income paid to Kansas by the Federal government. Nearly one-half of the \$1 billion total mentioned above was earned by Kansas residents in the Kansas City metropolitan area who work in Missouri.

Table 6-1 HOUSEHOLD PAYMENTS AS A PER CENT OF TOTAL INPUTS

1	Corn	.449
2	Sorghum	. 448
3	Wheat	. 427
4	Other Grains	.454
5	Soybeans	. 498
6	Нау	.628
7	Dairy Products	.207
8	Poultry and Poultry Products	.420
9	Cattle	.143
10	Hogs	.215
11	Other Agricultural Products	.304
12	Agricultural Services	.324
13	Crude Oil and Natural Gas	.084
14	Oil and Gas Field Services	.546
15	Nonmetallic Mining	.095
16	Other Mining	.098
17	Maintenance and Repair	-0-
18	Building Construction	.156
19	Heavy Construction	.366
20	Special Trade Construction	.253
21	Meat Products	.102
22	Dairy Products	.130
23	Grain Mill Products	.066

24	Other Food and Kindred Products	.141
25	Apparel	.383
26	Paper and Allied Products	.267
27	Printing and Publishing	.339
28	Industrial Chemicals	.193
29	Agricultural Chemicals	.167
30	Other Chemicals	.181
31	Petroleum and Coal Products	.066
32	Rubber and Plastics	.201
33	Cement and Concrete	.274
34	Other Stone and Clay	.380
3 5	Primary Metals	.279
36	Fabricated Metals	.304
37	Other Fabricated Metal Products	.277
38	Farm Machinery	.261
39	Construction Machinery	.295
40	Food Products Machinery	.310
41	Electrical Machinery	.254
42	Other Machinery	.343
43	Motor Vehicles	.241
44	Aerospace	. 445
45	Trailer Coaches	.185
46	Other Transportation Equipment	.071

47	Other Manufacturing	.298
48	Railroad Transportation	.440
49	Motor Freight	.235
50	Other Transportation	.257
51	Communications	.314
52	Electric Gas and Sanitary Services	.329
53	Groceries	.528
54	Farm Products	.300
55	Machinery and Equipment	.386
56	Other Wholesale Trade	.721
57	Farm Equipment Dealers	.459
58	Gasoline Service Stations	.478
59	Eating and Drinking	.409
60	Other Retail Trade	.468
61	Banking	.525
62	Other Finance	.591
63	Insurance and Real Estate	.442
64	Lodging Services	.317
65	Personal Services	.626
66	Business Services	.291
67	Medical and Health Services	.532
68	Other Services	.462
69	Education	671

Gross Savings

Gross savings includes both retained earnings and depreciation. In the transactions table it is represented by row 71. Gross savings as a per cent of total inputs is shown in Table 6-2. The highest ratio appears in sector 13, Crude Oil and Natural Gas, because of special legal provisions permitting higher "depreciation" than other industries.

A comparison of the total for row 71 and column 71 indicates that Gross Savings equals Gross Private Investment.

However, it may also be observed that some adjustment entries appear in row 71 in the Final Demand sectors. There are four such balancing entries in the columns for Inventory Change, Federal Government-Defense, Federal Government Non-Defense and exports. These are entered in the table in this manner to focus on the differences between expenditures and receipts from these sectors.

The two negative entries in the federal government sectors indicate that Kansas received about \$457 million more from the federal government that Kansas businesses and individuals paid to the federal government in taxes, fees, and miscellaneous expenditures.

The adjusting entry in the gross savings row and inventory change column reflects a \$13,499,000 increase in inventory during the year for all Kansas industries.

Purchases from out-of-state (imports) exceeded out-of-state sales (exports) by \$42,197,000 as indicated by the entry in row 71, column 77.

Payments to federal, state, and local government appear in rows 72, 73, and 74. These are primarily taxes although fees and other payments to

Table 6-2 GROSS SAVINGS AS A PER CENT OF TOTAL INPUTS

1	Corn	.130
2	Sorghum	.157
3	Wheat	.107
4	Other Grains	.082
5	Soybeans	.086
6	Нау	.099
7	Dairy Products	.082
8	Poultry and Poultry Products	.112
9	Cattle	.045
10	Hogs	.032
11	Other Agricultural Products	.128
12	Agricultural Services	.091
3	Crude Oil and Natural Gas	.420
4	Oil and Gas Field Services	.038
15	Nonmetallic Mining	.330
6	Other Mining	.344
7	Maintenance and Repair	-0-
8	Building Construction	.019
9	Heavy Construction	.056
20	Special Trade Construction	.034
21	Meat Products	.005
22	Dairy Products	.022
23	Grain Mill Products	.005

24	Other Food and Kindred Products	.020
25	Apparel	.033
26	Paper and Allied Products	.057
27	Printing and Publishing	.051
28	Industrial Chemicals	.124
29	Agricultural Chemicals	.019
30	Other Chemicals	.039
31	Petroleum and Coal Products	.063
32	Rubber and Plastics	.046
33	Cement and Concrete	. 125
34	Other Stone and Clay	.043
35	Primary Metals	.033
36	Fabricated Metals	.042
37	Other Fabricated Metal Products	.046
38	Farm Machinery	.056
39	Construction Machinery	.016
40	Food Products Machinery	.065
41	Electrical Machinery	.041
42	Other Machinery	.050
43	Motor Vehicles	.046
44	Aerospace	.029
45	Trailer Coaches	.014
46	Other Transportation Equipment	.016

47	Other Manufacturing	.026
48	Railroad Transportation	.113
49	Motor Freight	.083
50	Other Transportation	.124
51	Communications	.365
52	Electric Gas and Sanitary Services	.170
53	Groceries	.032
54	Farm Products	.162
55	Machinery and Equipment	.098
56	Other Wholesale Trade	.051
57	Farm Equipment Dealers	.109
58	Gasoline Service Stations	.070
59	Eating and Drinking	.013
60	Other Retail Trade	.095
61	Banking	.063
62	Other Finance	.035
63	Insurance and Real Estate	.032
64	Lodging Services	.086
65	Personal Services	.067
66	Business Services	.072
67	Medical and Health Services	. 123
68	Other Services	.067
69	Education	.003

governments are included.

Taxes paid by the industry groups, sectors 1-69, include only business taxes and payments. For instance, the personal income tax paid by a farm proprietor on his income is not included in any of the farm sector payments to government; rather it is a personal income tax payment which appears in column 70, rows 72 and 73.

Kansas business and persons paid nearly \$1.2 billion to the federal government in 1965 and more than \$1.1 billion to state and local government combined.

Imports (Out-of-State Purchases)

Kansas residents and businesses purchased more than \$4.9 billion of goods and services from out-of-state in 1965. About \$1.8 of this total represented consumption of goods and services by Kansas residents. Imports represented over 30 per cent of total expenditures by Kansas residents.

As a per cent of total purchases, imports ranged as high as 72 per cent of Other Wholesale Trade inputs to less than 7 per cent for Petroleum and Coal Products and Grain Mill Products. Nine industries purchased more than 50 per cent of their inputs from out-of-state as indicated by Table 6-3. Of the 68 industries in Table 6-3, 48 show import ratios in excess of 25 per cent.

The study was also designed to obtain the geographic and industrial origin of Kansas imports. Thus, for each industry group it is possible to determine the type of industry from which the Kansas industry is purchasing and its geographic location. This information is contained in another publication.*

M. Jarvin Emerson, Ronald G. Adams, and Leonard Atencio, Interindustry Import and Export Matrices for the Kansas Economy, Office of Economic Analysis, State of Kansas, 1969.

Table 6-3
RATIO OF IMPORTS (OUT-OF-STATE PURCHASES) TO TOTAL PURCHASES

1	Other Wholesale Trade	.720770
2	Education	.670779
3	Нау	.628249
4	Personal Services	.626176
5	Other Financial Institutions	.590915
6	Oil and Gas Field Services	.545927
7	Medical and Health	.532302
8	Groceries	.527934
9	Banking	.525155
10	Soybeans	.498330
11	Gasoline Service Stations	. 477557
12	Other Retail Trade	.467609
13	Other Services	.462027
14	Farm Equipment Dealers	.459296
15	Other Grains	.454131
16	Corn	.449084
17	Sorghum	.447696
18	Aerospace	.444882
19	Insurance and Real Estate	.441578
20	Railroad Transportation	.440153
21	Other Fabricated Metal Products	.433650
22	Wheat	.426986
23	Poultry	.420249

24	Eating and Drinking	.408503
25	Machinery and Equipment	. 385706
26	Apparel	.382615
27	Other Stone and Clay	.379504
28	Heavy Construction	.366110
29	Other Machinery	.343494
30	Printing and Publishing	.338653
31	Electric, Gas and Sanitary Services	.328641
32	Agricultural Services	.323500
33	Lodging Services	.316752
34	Communications	.313602
35	Food Products Machinery	.309706
36	Fabricated Metals	.303881
37	Other Agricultural Products	.303900
38	Farm Products	.299630
39	Other Manufacturing	.298009
40	Construction Machinery	.295346
41	Business Services	.290578
42	Primary Metals	.279486
43	Cement & Concrete	.274437
44	Paper and Allied Products	.266999
45	Farm Machinery and Equipment	.260522
46	Other Transportation	.257388

47	Electrical Machinery	.254011
48	Special Trade Construction	.253199
49	Motor Vehicles	.240874
50	Motor Freight	.235316
51	Hogs	.215227
52	Dairy Products	.206696
53	Rubber and Plastics	.201007
54	Industrial Chemicals	.192705
55	Trailer Coaches	.184916
56	Other Chemicals	.180926
57	Agricultural Chemicals	.166866
58	Building Construction	.156101
59	Cattle	.142896
60	Other Food and Kindred	.140578
61	Dairy Products	.129615
62	Meat Products	.102232
63	Other Mining	.098409
64	Nonmetallic Mining	.095075
65	Crude Oil and Natural Gas	.083554
66	Other Transportation Equipment	.070935
67	Petroleum and Coal Products	.065993
68	Grain Mill Products	.065858
69	Maintenance and Repair	.000000

Chapter 7

FINAL DEMAND CHARACTERISTICS

As explained in Chapters 3 and 5 the markets for the product or service of an industry can be divided into intermediate and final demand. Chapter 5 examined the nature of the intermediate or interindustry demand for the output of Kansas industries. This chapter examines the nature of the final markets or final demand components.

As indicated on the transactions matrix there are eight final demand sectors which are Kansas households, gross private investment, change in finished goods inventory, federal government-defense, federal government-nondefense, state government, local government, and exports.

Sales to each of these sectors by Kansas industries is indicated in Table 7-1.

Households

The relative importance of the household sector as a market for the output of each Kansas industry is indicated by Table 7-2 and Figure 7-1.

Nearly 94 per cent of the output of Other Retail Trade is sold to Kansas households. Eating and Drinking Establishments and Medical and Health Services rank next with 81 per cent of their sales to households. The highest ranking manufacturing industry is Dairy Products with 46 per cent of its output sold to households. Only six industries sell more than one-half of their total output to households. Of the 69 industries, 52 sell less than 20 per cent of their output to households and 47 sell less than 10 per cent.

Table 7-1

RATIO OF FINAL DEMAND SALES TO TOTAL SALES

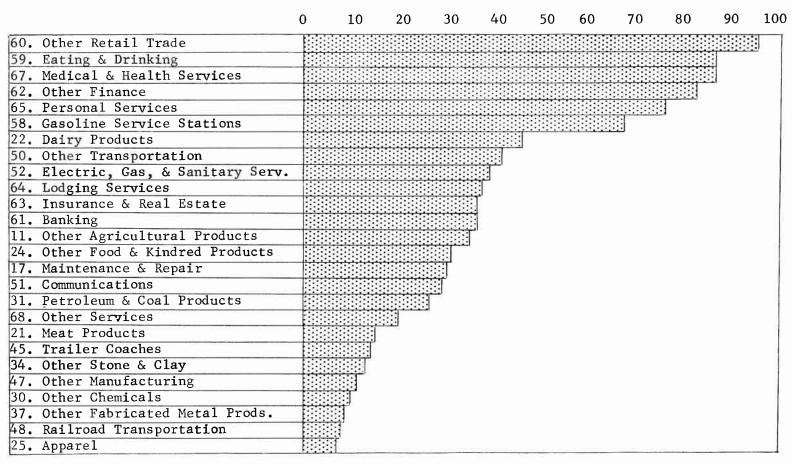
1	Motor Vehicles	.996891
2	Aerospace	.992460
3	Building Construction	.992007
4	Other Retail Trade	.962288
5	Education	.959253
6	Other Transportation Equipment	.956059
7	Other Financial Institutions	.952319
8	Heavy Construction	.946854
9	Medical and Health	.942177
10	Rubber and Plastics	.938688
11	Eating and Drinking	.938511
12	Apparel	.916710
13	Meat Products	.910773
14	Trailer Coaches	.905605
15	Other Grains	.897662
16	Construction Machinery	.897214
17	Petroleum and Coal Products	.890878
18	Dairy Products	.857171
19	Nonmetallic Mining	.850229
20	Other Chemicals	.837767
21	Other Stone and Clay	.834522
22	Personal Services	.821313
23	Other Food and Kindred	.820076

24	Other Machinery	.784414
25	Food Products Machinery	.773116
26	Gasoline Service Stations	.765267
27	Electrical Machinery	.762929
28	Railroad Transportation	.759085
29	Grain Mill Products	.741216
30	Industrial Chemicals	.735742
31	Fabricated Metals	.705872
32	Other Fabricated Metal Products	.699717
33	Other Manufacturing	.678459
34	Farm Machinery and Equipment	.677705
35	Banking	.651253
36	Insurance and Real Estate	.643434
37	Lodging Services	.633961
38	Wheat	.619284
39	Printing and Publishing	.617696
40	Poultry	.609989
41	Other Transportation	.602110
42	Paper and Allied Products	.601300
43	Motor Freight	.587892
44	Agricultural Chemicals	.547885
45	Maintenance and Repair	.506308
46	Primary Metals	.490707

47	Other Mining	.481916
48	Cement and Concrete	.449878
49	Corn	.440072
50	Electric, Gas and Sanitary Services	.435527
51	Communications	.413877
52	Farm Products	.410230
53	Sorghum	.400845
54	Other Agricultural Products	.378608
5 5	Other Services	.339480
56	Cattle	.263978
57	Groceries	.259055
58	Crude Oil and Natural Gas	.232379
59	Business Services	.228330
60	Soybeans	.189634
61	Machinery and Equipment	.182733
62	Hogs	.146642
63	Dairy Products	.141457
64	Нау	.128712
65	Farm Equipment Dealers	.107247
66	Agricultural Services	.066287
67	Other Wholesale Trade	.046618
68	Special Trade Construction	.034470
69	Oil and Gas Field Services	.000000

Figure 7-1
PER CENT OF TOTAL SALES TO KANSAS HOUSEHOLDS

SECTOR



	0	10	20	30	40	50	60	70	80	90	100
8. Poultry & Poultry Products											
49. Motor Freight											
69. Education											
12. Agricultural Services											
33. Cement & Concrete	::::										
46. Other Transportation Equipment											
66. Business Services											
53. Groceries											
10. Hogs											
7. Dairy Products											
32. Rubber & Plastics											
37. Other Fabricated Metal Prods.											
29. Agricultural Chemicals	И										
56. Other Wholesale Trade	H										- 1
41. Electrical Machinery	13										1
57. Farm Equipment Dealers											1
26. Paper & Allied Products	13										- 1
55. Machinery & Equipment											
9. Cattle	1										- 1
44. Aerospace	3										1
23. Grain Mill Products]										
38. Farm Machinery	1										
54. Farm Products	1										
42. Other Machinery	_[:										
43. Motor Vehicles											

Table 7-2

RANKED RATIOS OF SALES TO KANSAS HOUSEHOLDS BY PROCESSING SECTORS

Sector		Household Sales/Total Output
60	Other Retail Trade	.939738
59	Eating & Drinking	.871638
67	Medical & Health Services	.870943
62	Other Finance	.816410
65	Personal Services	.760775
58	Gasoline Service Stations	.669737
22	Dairy Products	.461800
50	Other Transportation	.423160
52	Electric Gas & Sanitary Services	.394255
64	Lodging Services	.368049
63	Insurance & Real Estate	.362959
61	Banking	.361047
11	Other Agricultural Products	.342583
24	Other Food & Kindred Products	.307590
17	Maintenance & Repair	.303832
51	Communications	.286330
31	Petroleum & Coal Products	.256550
68	Other Services	.195251
21	Meat Products	.154551
45	Trailer Coaches	. 139747
34	Other Stone & Clay	.131552
47	Other Manufacturing	.111737

Sector		Household Sales/Total Output
30	Other Chemicals	.098372
37	Other Fabricated Metal Products	.090557
48	Railroad Transportation	.075842
25	Apparel	.071620
8	Poultry & Poultry Products	.057871
49	Motor Freight	.045976
69	Education	.039201
12	Agricultural Services	.039083
33	Cement & Concrete	.035421
46	Other Transportation Equipment	.032801
66	Business Services	.032127
53	Groceries	.028009
10	Hogs	.018056
7	Dairy Products	.016054
32	Rubber & Plastics	.014898
37	Other Fabricated Metal Products	.012664
29	Agricultural Chemicals	.012323
56	Other Wholesale Trade	.011743
41	Electrical Machinery	.010126
57	Farm Equipment Dealers	.010035
26	Paper & Allied Products	.009440
55	Machinery & Equipment	.006056
9	Cattle	.003935
44	Aerospace	.003507

Sector	-	Household Sales/Total Output
23	Grain Mill Products	.003147
38	Farm Machinery	.001459
54	Farm Products	.001141
42	Other Machinery	.000746
43	Motor Vehicles	.000342
	(All Other Values are Zero)	

Federal Government

The federal government is a sizable purchaser of Kansas products and services. Because of its relative importance, federal government is divided into two categories: Federal Government-Defense and Federal Government-Nondefense. Federal Government Defense purchases from Kansas totaled \$583 million and nondefense expenditures \$1,052 million in 1965.

The relative importance of Federal government purchases for each Kansas industry is indicated in Table 7-3. Aerospace and wheat sell 48 and 46 per cent of their output to the Federal government. However, the former is almost entirely for defense purposes while the latter is for nondefense.

Farm sales to the federal government include sales which may be exported by the federal government under various programs, primarily Public Law 480.

These exports are in addition to private exports contained in column 77.

State and Local Government

Together State and Local government purchase \$1,139 million of which \$1,086 million is purchased from Kansas firms and households. In each category the largest outlay is to the Education sector since education is treated as a separate industry.

Both state and local government purchase more of their commodities and services from inside the state than do most other industries. In each category the import ratio is substantially below ten per cent.

Gross Private Investment

Gross private investment in Kansas in 1965 totaled \$654,520,000 of which Kansas firms and workers provided \$568,887. The majority of the sales to capital formation was by the construction industry which accounted for nearly 75 per cent of the amount supplied by Kansas industries. Imports of capital

Table 7-3
PERCENTAGE OF KANSAS INDUSTRY SALES TO FEDERAL GOVERNMENT

	Industry	Defense	Nondefense	Total
1.	Corn	-0-	15.52	15.52
2.	Sorghum	-0-	16.37	16.37
3.	Wheat	-0-	46.08	46.08
4.	Other Grains	-0-	34.60	34.60
5.	Soybeans	-0-	1.37	1.37
6.	Нау	-0-	1.15	1.15
7.	Dairy Products	-0-	1.36	1.36
8.	Poultry and Poultry Products	-0-	1.38	1.38
9.	Cattle	-0-	.82	.82
10.	Hogs	-0-	1.35	1.35
11.	Other Agricultural Products	-0-	.82	.82
12.	Agricultural Services	-0-	-0-	-0-
13.	Crude Oil and Natural Gas	-0-	-0-	-0-
14.	Oil and Gas Field Services	-0-	-0-	-0-
15.	Nonmetallic Mining	-0-	-0-	-0-
16.	Other Mining	-0-	-0-	-0-
17.	Maintenance and Repair	.05	.43	.48
18.	Building Construction	-0-	-0-	-0-
19.	Heavy Construction	-0-	-0-	-0-
20.	Special Trade Construction	-0-	-0-	-0-
21.	Meat Products	3.18	-0-	3.18
22.	Dairy Products	1.83	.35	2.18
23.	Grain Mill Products	.60	10.34	10.94

	Industry	Defense	Nondefense	<u>Total</u>
24.	Other Food and Kindred Products	.08	-0-	.08
25.	Appare1	.02	-0-	.02
26.	Paper and Allied Products	.03	.08	.11
27.	Printing and Publishing	.05	. 56	.61
28.	Industrial Chemicals	.23	-0-	.23
29.	Agricultural Chemicals	.01	-0-	.01
30.	Other Chemicals	1.51	.25	1.76
31.	Petroleum and Coal Products	.51	.58	1.09
32.	Rubber and Plastics	2.67	.04	2.71
33.	Cement and Concrete	5.08	.01	5.09
34.	Other Stone and Clay	.08	-0-	.08
35.	Primary Metals	-0-	.91	.91
36.	Fabricated Metals	-0-	1.30	1.30
37.	Other Fabricated Metal Products	2.86	.01	2.87
38.	Farm Machinery	.05	.01	.06
39.	Construction Machinery	.03	1.54	1.57
40.	Food Products Machinery	-0-	-0-	-0-
41.	Electrical Machinery	3.91	- 0-	3.91
42.	Other Machinery	.56	.01	.57
43.	Motor Vehicles	15.38	-0-	15.38
44.	Aerospace	47.41	. 41	47.82
45.	Trailer Coaches	-0-	-0-	-0-
46.	Other Transportation Equipment	-0-	.24	.24

	Industry	Defense	Nondefense	<u>Total</u>
47.	Other Manufacturing	1.75	.24	1.99
48.	Railroad Transportation	3.49	.62	4.11
49.	Motor Freight	2.99	.75	3.74
50.	Other Transportation	5.90	1.04	6.94
51.	Communications	1.30	.86	2.16
52.	Electric Gas and Sanitary Services	.97	.70	1.67
53.	Groceries	2.46	.24	2.70
54.	Farm Products	-0-	-0-	-0-
55.	Machinery and Equipment	.79	.79	1.58
56.	Other Wholesale Trade	-0-	.37	.37
57.	Farm Equipment Dealers	.41	-0-	.41
58.	Gasoline Service Stations	-0-	-0 -	-0-
59.	Eating and Drinking	- 0-	-0-	-0-
60.	Other Retail Trade	-0-	-0-	-0-
61.	Banking	-0-	15.19	15.19
62.	Other Finance	-0-	3.00	3.00
63.	Insurance and Real Estate	- 0-	.85	.85
64.	Lodging Services	-0-	-0-	-0-
65.	Personal Services	-0-	-0-	-0-
66.	Business Services	-0-	-0-	-0 -
67.	Medical and Health Services	-0-	1.36	1.36
68.	Other Services	-0-	.14	.14
69.	Education	-0-	8.44	8.44

goods totaled \$85,633,000.

Change in Finished Goods Inventory

During the 1965 production period finished goods inventory increased \$13,499,000. Changes in raw materials inventory are assigned back to the producing sector as explained in Chapter 3.

Exports (Out-of-State Sales)

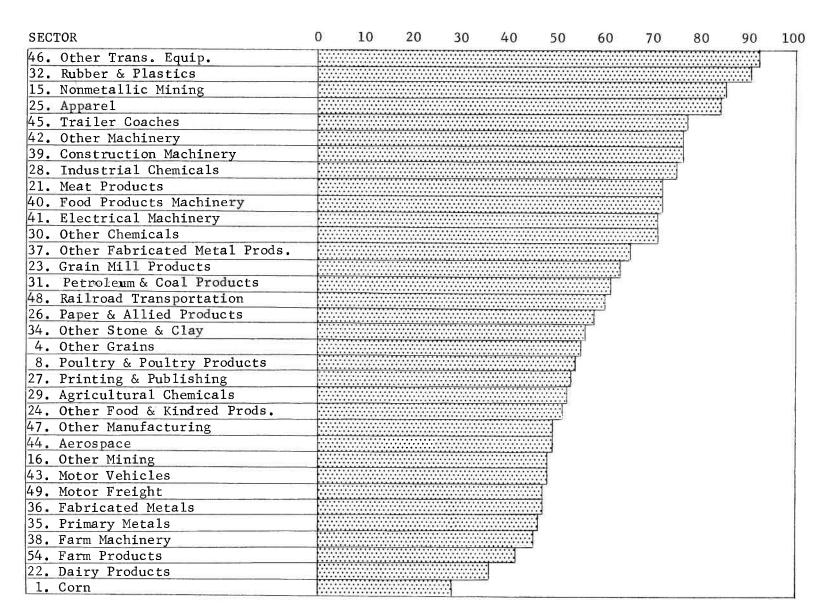
Out-of-state sales of Kansas goods and services amounted to \$4,873,162,000 or \$42,197,000 less than imports.

Column 77 of the transactions table indicates the dollar value of exports for each industry. For Other Transportation Equipment manufacturing more than 91 per cent of its market is out-of-state as indicated by Table 7-4 and Figure 7-2. Exports account for more than one-half of the market for the output of 23 industries in the state. All but three of these are manufacturing industries. Hence, 20 of the 27 manufacturing industries sell more than 50 per cent of their output outside the state's borders.

As with imports, the study identified the industrial and geographic nature of export markets. These characteristics are summarized in a separate publication.

Figure 7-2

EXPORT RATIOS OF KANSAS PROCESSING SECTORS



	0	10	20	30	40	50	60	70	80	90	100
9. Cattle	(:::			-120							
63. Insurance & Real Estate											
33. Cement & Concrete											1
2. Sorghum											
13. Crude Oil & Natural Gas											
66. Business Services											
64. Lodging Services											- 1
5. Soybeans	:::::										Î
3. Wheat			·::								
6. Hay	;;;;										
10. Hogs											
53. Groceries	::::										
7. Dairy Products											
18. Building Construction	1										
50. Other Transportation	- I										
19. Heavy Construction	100	*****									
51. Communications											
68. Other Services	1000										
55. Machinery & Equipment	***										
58. Gasoline Service Stations											- 3
61. Banking	***										
62. Other Finance		∭									1
65. Personal Finance	1000										
59. Eating & Drinking		:T'									
57. Farm Equipment Dealers		3									
20. Special Trade Construction		3									
12. Agricultural Services		-0									1
11. Other Agricultural Prods.	· · ·										
69. Education											- 1
56. Other Wholesale Trade	133										
60. Other Retail Trade											
67. Medical & Health Services	3										
52. Electric, Gas, & Sanitary Serv	. []										

Table 7-4

RANKED EXPORT RATIOS OF KANSAS PROCESSING SECTORS

Sector		Exports/Total Output
46	Other Transportation Equipment	.916001
32	Rubber & Plastics	.896597
15	Nonmetallic Mining	.850230
25	Apparel	.839344
45	Trailer Coaches	.765738
42	Other Machinery	.761748
39	Construction Machinery	. 758871
28	Industrial Chemicals	.750402
21	Meat Products	.724388
40	Food Products Machinery	.719490
41	Electrical Machinery	.713739
30	Other Chemicals	.711547
37	Other Fabricated Metal Products	.662298
23	Grain Mill Products	.627630
31	Petroleum & Coal Products	.610587
48	Railroad Transportation	.598823
26	Paper & Allied Products	.578377
34	Other Stone & Clay	.557416
4	Other Grains	.551620
8	Poultry & Poultry Products	.538349
27	Printing & Publishing	.532823
29	Agricultural Chemicals	.519330
24	Other Food & Kindred Products	.511051

Sector		Exports/Total Output
47	Other Manufacturing	. 494689
44	Aerospace	.489777
16	Other Mining	.481916
43	Motor Vehicles	.479572
49	Motor Freight	.472414
36	Fabricated Metals	.470499
35	Primary Metals	.464234
38	Farm Machinery	. 452985
54	Farm Products	.409089
22	Dairy Products	.360437
1	Corn	.284837
9	Cattle	.251814
63	Insurance & Real Estate	.238524
33	Cement & Concrete	.237946
2	Sorghum	.237112
13	Crude Oil & Natural Gas	.232379
66	Business Services	. 193934
64	Lodging Services	.185262
5	Soybeans	.175973
3	Wheat	.158517
6	Нау	.117248
10	Hogs	.115057
53	Groceries	.114036
7	Dairy Products	.111819

Sector		Exports/Total Output
18	Building Construction	.109121
50	Other Transportation	.099856
19	Heavy Construction	.082897
51	Communications	.081949
68	Other Services	.079464
55	Machinery & Equipment	.074416
58	Gasoline Service Stations	.073033
61	Banking	.065234
62	Other Finance	.062919
65	Personal Services	.059551
59	Eating & Drinking	.051139
57	Farm Equipment Dealers	.049068
20	Special Trade Construction	.048550
12	Agricultural Services	.027205
11	Other Agricultural Products	.025311
69	Education	.018664
56	Other Wholesale Trade	.015541
60	Other Retail Trade	.014614
67	Medical & Health Services	.006621
52	Electric Gas & Sanitary Services	.006331
14	Oil & Gas Field Services	.000000
17	Maintenance & Repair	.000000

		al production of the contract

Chapter 8

GROSS STATE PRODUCT

The initial label attached to this study was "The Kansas Gross Product Study." Two main reasons were responsible for the title. First, the impetus for a detailed study of the Kansas economy was a more detailed picture of the production and income components of the state's economy. Second, the title seemed more familiar than the term "input-output analysis." However, after the study was designed and initiated, it was apparent that a detailed measure of gross state product and income was but a small part of the total study. Hence, a more encompassing title was selected.

This chapter presents the gross state product accounts as well as personal income accounts. The definitions of each is standardized with the U.S. Department of Commerce definitions.

Gross State Product-Value Added

Several approaches may be used in measuring gross state product of which one is the value added method. Roughly, this measures the difference between gross receipts and cost of goods sold. Thus, it represents the value added to goods and services by each industry. The major components are wages, interest, rent, and gross profit.

Gross state product for Kansas in 1965 was \$6,945,945,000 as indicated in Table 8-1. The processing sectors, sectors 1-69, accounted for \$5,010,837,000 and the final payments sectors \$1,935,108,000.

Industries are ranked according to their contribution to state gross product in Table 8-i. Education, which includes both public and private at

all levels, ranks first. Since education is broadly defined to include all types of educational facilities and activities, this high value added figure is not surprising. Aerospace is the second largest component in the processing sector, followed by Other Retail Trade.

The amount of gross state product originating in each industry is specified in the remainder of Table 8-1. This is the first detailed account of the production structure of the Kansas economy.

Personal Income

Personal income by industry is shown in Table 8-2. This is the same information which appears in row 70 of the transactions table. Kansas personal income in 1965 was \$6,001,000,000. Of the processing sectors, Education ranked first with \$363,446,000, followed by Aerospace with \$249,638,000.

By subtracting taxes from personal income, disposable personal income can be obtained. In 1965 disposable personal income totaled \$4,642,410,000. Of this total, \$4,440,683,000 represented consumer outlays and \$201,727,000 was personal savings.

Table 8-1

GROSS KANSAS PRODUCT BY INDUSTRY ORIGINATING 1965

(In thousands of dollars)

69.	Education	390,600
44.	Aerospace	295,333
60.	Other Retail Trade	258,382
62.	Other Finance	230,543
13.	Crude Oil & Natural Gas	225,794
67.	Medical & Health Services	213,856
63.	Insurance & Real Estate	203,568
3.	Wheat	180,845
65.	Personal Services	176,400
52.	Electric Gas & Sanitary Services	163,678
48.	Railroad Transportation	162,603
61.	Banking	133,906
20.	Special Trade Construction	121,635
9.	Cattle	117,800
2.	Sorghum	111,768
51.	Communications	110,059
56.	Other Wholesale Trade	102,433
43.	Motor Vehicles	97,360
6.	Hay	91,985
18.	Building Construction	87,583

59.	Eating & Drinking	84,060
31.	Petroleum & Coal Products	76,612
49.	Motor Freight	66,146
21.	Meat Products	65,546
19.	Heavy Construction	59,614
42.	Other Machinery	57,752
30.	Other Chemicals	55,718
28.	Industrial Chemicals	54,285
1.	Corn	53,917
27.	Printing & Publishing	53,494
23.	Grain Mill Products	49,581
68.	Other Services	46,845
55.	Machinery & Equipment	44,357
54.	Farm Products	43,369
34.	Other Stone & Clay	42,824
58.	Gasoline Service Stations	42,195
32.	Rubber & Plastics	39,446
24.	Other Food & Kindred Products	37,699
33.	Cement & Concrete	36,462
15.	Nonmetallic Mining	31,207
53.	Groceries	27,447
14.	Oil & Gas Field Services	27,421
26	Fabricated Motals	26 688

37.	Other Fabricated Metals	25,541
26.	Paper & Allied Products	25,479
10.	Hogs	25,289
5.	Soybeans	25,211
12.	Agricultural Services	24,697
7.	Dairy Products	21,584
16.	Other Mining	20,804
57.	Farm Equipment Dealers	20,376
47.	Other Manufacturing	20,263
38.	Farm Machinery	19,374
22.	Dairy Products	18,737
25.	Appare1	17,466
66.	Business Services	17,249
50.	Other Transportation	17,097
39.	Construction Machinery	16,046
64.	Lodging Services	15,476
41.	Electrical Machinery	13,626
8.	Poultry & Poultry Products	12,329
40.	Food Products Machinery	11,239
35.	Primary Metals	10,794
11.	Other Agricultural Products	9,464
45.	Trailer Coaches	8,846
46	Other Transportation Equipment = = =	E 600

	4. Other Grains	5,343	
	29. Agricultural Chemicals	3,990	
	17. Maintenance & Repair		
Total	Value Created in Processing Sectors	\$5,010,837	
Value	Created in Final Demand Sectors		
	Households	388,446	
	Gross Private Capital Investment	29,487	
	Federal Government-Defense	217,111	
	Federal Government-Nondefense	458,135	
	State Government	108,449	
	Local Government	129,139	
	Exports	1,048,340	
	Less: Transfer Payments	- 444,000	
	Value Created in Final Demand Sectors	1,935,108	
	GROSS KANSAS PRODUCT	\$6,945,945	

Table 8-2
PERSONAL INCOME BY INDUSTRY OR SECTOR,
KANSAS 1965

(In Thousands of Dollars)

Corn	39,916	Metal Products	60,382
Sorghum	79,963	Dairy Products	14,609
Wheat	137,312	Grain Mill Products	21,979
Other Grains	4,311	Other Food & Kindred Products	29,114
Soybeans	20,906	Appare1	14,565
Нау	77,017	Paper & Allied Products	20,180
Dairy Products	14,947	Printing & Publishing	40,327
Poultry & Poultry Products	9,578	Industrial Chemicals	29,610
Cattle	85,305	Agricutural Chemicals	2,771
Hogs	21,706	Other Chemicals	41,594
Other Agricultural Products	6,062	Petroleum & Coal Products	38,298
Agricultural Services	18,868	Rubber & Plastics	30,497
Crude Oil & Natural Gas	36,911	Cement & Concrete	20,903
Oil & Gas Field Services	25,354	Other Stone & Clay	36,639
Nonmetallic Mining	6,953	Primary Metals	8,777
Other Mining	4,616	Fabricated Metals	21,248
Maintenance & Repair	-0-	Other Fabricated Metal Products	20,803
Building Construction	57,334	TOddets	20,003
Heavy Construction	45,764	Farm Machinery	13,448
Special Trade Construction	87,304	Construction Machinery	14,129

Food Products Machinery	8,291	Other Retail Trade	196,176
Electrical Machinery	11,016	Banking	87,519
Other Machinery	43,703	Other Finance	186,694
Motor Vehicles	53,774	Insurance & Real Estate	174,376
Aerospace	249,638	Lodging Services	10,864
Trailer Coaches	7,824	Personal Services	149,604
Other Transportation Equipment	3,146	Business Services	12,701
Other Manufacturing	17,714	Medical & Health Services	160,271
Railroad Transportation	109,990	Other Services	37,296
Motor Freight	32,342	Education	363,446
Other Transportation	9,448	Households	388,446
Communications	50,318	Gross Private Investment	29,487
Electric Gas & Sanitary Services	93,654	Change in Finished Goods Inventory	-0-
Groceries	24,058	Federal Government Defense	217,111
Farm Products	24,361	Federal Government Non- defense	458,135
Machinery & Equipment	31,847	State Government	108,449
Other Wholesale Trade	91,344	Local Government	129,139
Farm Equipment Dealers	13,955	Exports	1,048,340
Gasoline Service Stations	35,488	TOTAL INCOME	6 ,001,000
Eating & Drinking	71,035		

Chapter 9

STATE ECONOMIC PLANNING MODELS

The recent emergence of state economic development planning in Kansas and other states may be attributed to three factors. First, rapidly rising state expenditures have accentuated the magnitude of state programs. Second, persistent structural economic changes require translation into state government program responses or alterations. Third, a multiplicity of factors have changed the nature of the demand for state government services.

State government expenditures in all states have been rising faster than income. Nationally, this increase in state government activity has been at a rate nearly double the rise in personal income. As Table 9-1 shows, Kansas has paralleled the national pattern. From 1957 to 1967, state general expenditures increased from \$435 million to \$964 million, a 120 per cent increase. These rising expenditures increase the necessity for a state to systematically examine its program determinants, since it is spending a larger portion of the state's personal income for public goods and services.

Structural change is not a new phenomenon to Kansas. The outmigration from agriculture stemming from increased efficiency has been experienced for several decades. But structural problems are not restricted to agriculture. Abrupt changes in defense spending, transportation rate alterations, obsolescence of mines, and industrial spill-over effects are but a few readily identified forces changing the shape of the state's economy. The economic consequences range from a rapid growth area to a depressed region, both associated with significant problems. The state's reaction to such develop-

Table 9-1

KANSAS STATE GOVERNMENT OPERATING AND NON OPERATING EXPENDITURES, 1957-1967 (Thousands of Dollars)

1957	-	-	-	-	-	-	_	-	-	-	-	•	-	435,369
1958		-	=		=	-	-		-	ंज	-	===	-	473,156
1959	-	-	-	-	-	-	-	-	-	: 	-	-	-	552,072
1960	_	-	-	-	_	_	-	_	-	24	_	=	_	546,191
1961	-	-	-	-	•	-	-	-	-	-		-	-	608,126
1962	2.55	· 	 8	-	 .	-	:=:	-	-	ात		=	-	637,315
1963	-	-	-	-	-	-	-	-	-	-		-	_	686,161
1964	-	-	-		-	-	-	-	-	-	-	-	-	735,131
1965	-	-	-	-	-	-	-	-	-	-	-	-	-	776,853
1966) 	-		=	-	-	-	-	-	. 	 c	-	=	901,700
1967	-	-	-	-	-	_	-	-	_	-	-	_	-	964,309

ments requires a flow of information specifying the nature of the structural transformation.

Rising income and changing industrial structure significantly alter the composition of demand for public goods and services. Evidence of the past decade indicates that consumers prefer to spend a higher percentage of their additional income on services-both public and private. The demand for better education, health services, roads, and recreation has risen faster than income. The changing composition of the demands on state government is also a reflection of a change in industry mix and employment patterns. Increased urbanization, declining farm population, and the emergence of new industry have altered the service requirements of state government.

Data Requirements

The information requirements for state government to make decisions with respect to programs and tax policies have expanded along with its rising role. No two state agencies require exactly the same information upon which to base their decisions. However, a commonality of certain basic data was determined by surveying all state agencies with respect to their data needs. Current economic and population data as well as economic and population forecasts were the main data requirements of the majority of state agencies for their planning purposes.

Two general types of economic information systems are required for decision making purposes by state government. The following discussion sets forth both types of information systems: the short-run impact model and the long-run forecasting model.

Monitoring the performance of the Kansas economy is required for both short-run developments as well as long-term trends. The core of the

information systems to provide both is the same, however, the configuration surrounding each is dissimilar.

Short-run impact analysis is a frequent requirement for both passive and active potential responses by state government.

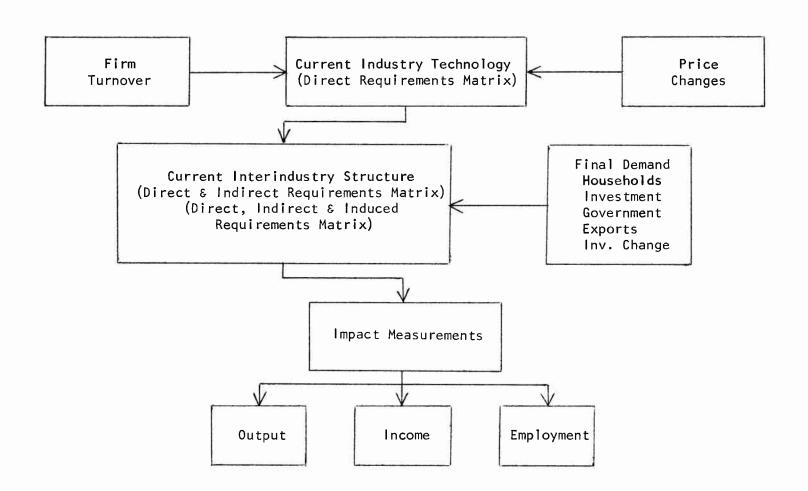
The response of many state agency and/or legislative decisions is geared to changes in activity levels of the state economy. For instance, total revenue is closely tied to state personal income with the result that if factors affecting personal income can be identified, revenue fluctuations can be anticipated. Short-run planning problems of state government are similar in character.

A more active role is frequently required of the state government with respect to developments affecting the state's economy. This action may take the form of either programs or persuasion. If an adverse development affects a state industry or region, the state may choose to mitigate these effects. Likewise, the consequences of the desirable development might be amplified with proper state programs. Because of the substantial role which the federal government plays in influencing the well-being of the state's economy, monitoring its impact is of crucial importance in attempting to properly represent the state's interest in the national government arena.

Prior to the completion of the Kansas input-output matrices, the state possessed meager information flows to measure impacts of actual or potential developments on the state's economy. Although the input-output system is not a panacea to answer all "impact type" questions, it is capable of measuring a myriad of impacts-actual or potential.

The general structure of the short-run impact system is presented in Figure 9-1. The core of the information system consists of either the

Figure 9-1
SHORT-RUN IMPACT MODEL



Direct and Indirect Requirements Matrix or the Direct, Indirect, and Induced Requirements Matrix discussed in Chapter 3. Either of these represent the interindustry structure of the Kansas economy.

The components of final demand are the variables in the system. For instance, if the level of federal government spending is changed for any number of industries, the impact system can measure:

- (1) the resulting output changes for each industry in the state as well as the change in total state output and Gross State Product
- (2) the resulting changes in personal income from each industry and the total change in state personal income
- (3) the resulting changes in employment by industry and for the state

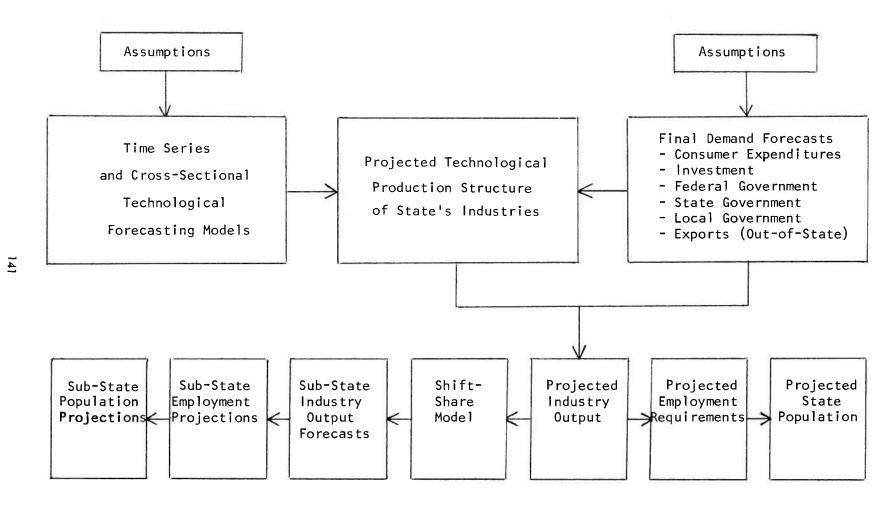
Chapter 10 explains the procedures involved in measuring impacts of developments on the Kansas economy. Several examples are included in the discussion.

Since planning usually has a longer time horizon than short-run analysis, long-run trends must also be considered in an economic information system for state government. Such a system is essentially an economic forecasting system. In the context of the input-output core of the system, it is an interindustry forecasting system.

The forecasting model considers both technological change and changes in the demand for Kansas goods and services-changes in the competitive position of the state. Forecasts and the forecasting methodology are contained in a separate publication.* A format of the model is contained in Figure 9-2.

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^{*}M. Jarvin Emerson and Leonard D. Atencio, <u>An Interindustry Forecast</u> of the Kansas Economy, Kansas Office of Economic Analysis, 1969.



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Chapter 10

IMPACT ANALYSIS

What will be the impact on Kansas industries of a reduction in military purchases? What will be the effect on Kansas personal income of a new sugar beet refining plant? What will be the impact on the Kansas economy of an increase in meat production? To what extent will the industries supplying farm inputs be affected by a decrease in wheat acreage?

These are a sample of frequently asked questions which can be answered by the analytical potential of an input-output system. This section offers an explanation of the procedures for using interindustry analysis to measure the impacts of actual or anticipated developments affecting the Kansas economy. The first part presents a discussion of output and income multipliers. The second part presents some examples of the uses of the impact measuring potential of the input-output system.

Output Multipliers

Linkages among industries were discussed in general in Chapter 3. In that earlier discussion it was shown how a change in output in one industry would initiate changes in output in other industries. These relationships were summarized in the matrix of direct and indirect requirements. Since this matrix is the core of impact analyses, a brief review of its contents is useful.

The values in a column in the matrix of direct and indirect requirements showed the output increases by each industry in the state which would result from a one dollar increase in demand from the industry represented in the column.

In order to determine the effects on each industry of an increased demand for the output of a particular industry, the procedure is to simply multiply the values in the column of the industry experiencing the increased demand by the amount of the demand increase. Thus, if the Meat Products industry increased its output by \$1 million, multiply the values in column 21 by \$1 million. Among the numerous industry effects, this calculation would indicate that if the Meat Products industry increased its output by \$1 million, the output of the Other Food and Kindred Products industry would rise by more than \$51,000. Nearly all industries would be effected to some degree.

The total output increases of all industries as a result of a one dollar increase in output of the industry labeled in the column can be obtained by summing the values in the respective columns of the matrix of direct and indirect requirements. For instance, the sum of column 21 is 2.590568. This indicates that the output of all Kansas industries increases by about \$2.59 when the Meat Products industry increases its output by one dollar. Such a relationship is called an output multiplier. If demand for Meat Products increases by one dollar, total output of all Kansas industries rises by 2.59 times the demand increase of the Meat Products industry. So that if demand for Meat Products were to increase by \$500,000, total output of all Kansas industries would increase by \$1,295,000.

The output multiplier may be summarized as follows:

An Industry Output Multiplier = Sum of that industry's column values in the matrix of direct and indirect requirements.

The output multipliers for each of the 69 Kansas industries or sectors are presented in Table 10-1. All, of course, are larger than unity. Meat Products, Maintenance and Repair, Dairy Products, and Cattle are the sectors with the highest multipliers. Interestingly, the Aerospace industry, which

Table 10-1

OUTPUT MULTIPLIERS: TOTAL DIRECT AND INDIRECT OUTPUT REQUIREMENTS
FOR KANSAS INDUSTRIES TO MAKE AN ADDITIONAL \$1 DELIVERY TO FINAL DEMAND

Se	ctor	Output Multiplier
1.	Corn	1.277570
2.	Sorghum	1.067126
3.	Wheat	1.380008
4.	Other Grains	1.465618
5.	Soybeans	1.370114
6.	Нау	1.251677
7.	Dairy Products	1.930507
8.	Poultry & Poultry Products	1.565853
9.	Cattle	2.031102
10.	Hogs	1.974438
11.	Other Agricultural Products	1.575500
12.	Agricultural Services	1.419273
13.	Crude Oil & Natural Gas	1.495314
14.	Oil & Gas Field Services	1.463595
15.	Nonmetallic Mining	1.614402
16.	Other Mining	1.714711
17.	Maintenance & Repair	2.218130
18.	Building Construction	1.706107
19.	Heavy Construction	1.516684
20.	Special Trade Construction	1.218130
21.	Meat Products	2.590568
22.	Dairy Products	2.205620
23.	Grain Mill Products	1.786472

		0
Sec	tor	Output <u>Multiplier</u>
24.	Other Food & Kindred Products	1.470625
25.	Apparel	1.048788
26.	Paper & Allied Products	1.199799
27.	Printing & Publishing	1.118773
28.	Industrial Chemicals	1.225635
29.	Agricultural Chemicals	1.198508
30.	Other Chemicals	1.245607
31.	Petroleum & Coal Products	1.853648
32.	Rubber & Plastics	1.080503
33.	Cement & Concrete	1.393208
34.	Other Stone & Clay	1.135211
35.	Primary Metals	1.114068
36.	Fabricated Metals	1.089149
37.	Other Fabricated Metal Products	1.144391
38.	Farm Machinery	1.199104
39.	Construction Machinery	1.206864
40.	Food Products Machinery	1.126168
41.	Electrical Machinery	1.142594
42.	Other Machinery	1.093538
43.	Motor Vehicles	1.099205
44.	Aerospace	1.094682
45.	Trailer Coaches	1.256355
46.	Other Transportation Equipment	1.016526

Sec	tor	Output Multiplier
47.	Other Manufacturing	1.196927
48.	Railroad Transportation	1.144334
49.	Motor Freight	1.146545
50.	Other Transportation	1.220918
51.	Communications	1.404125
52.	Electric Gas & Sanitary Services	1.636593
53.	Groceries	1.339305
54.	Farm Products	1.544942
55.	Machinery & Equipment	1.403110
56.	Other Wholesale Trade	1.163072
57.	Farm Equipment Dealers	1.422614
58.	Gasoline Service Stations	1.452235
59.	Eating & Drinking	1.461033
60.	Other Retail Trade	1.334287
61.	Banking	1.243952
62.	Other Finance	1.178661
63.	Insurance & Real Estate	1.376783
64.	Lodging Services	1.414058
65.	Personal Services	1.235321
66.	Business Services	1.408283
67.	Medical & Health Services	1.258409
68.	Other Services	1.285427
69.	Education	1.283494

is one of the larger industries in Kansas has a low multiplier. This means that the Aerospace industry purchases a very small percentage of its inputs from Kansas industries.

These output multipliers, which are summary indices of a large matrix, provide an expedient way of estimating certain impacts. For instance, if Building Construction increases by \$10 million, total output of all Kansas industries will expand by more than \$17 million (the output multiplier of 1.706107 multiplied by the initial increased demand of \$10 million). Of course the increased output of any industry as a result of an increased demand for another industry's output can be determined directly from the column of the industry experiencing the increased demand.

A Multiplier Matrix

In order to determine the impact on each state industry of a change in the demand for a single industry or several industries, the matrix of direct and indirect requirements is employed.

The arithmetic of the procedure is to multiply each column in the matrix by the sum of all the final demand entries for the industry which the column represents and then sum across the rows. The result is a column of new total outputs for each industry which can then be compared with the outputs prior to the actual or hypothetical changes in the demand for the industries output. This process is presented diagramatically in Figure 10-1. The matrix of direct and indirect requirements is multiplied by a final demand vector which is obtained by combining columns 70 through 77 into one final demand column.

Because of the size of the Kansas matrix the calculations require the use of a computer. The matrix is continually stored in the memory of a computer to facilitate rapid results for such impact calculations. The

Figure 10-1

Schematic Representation of Technique for Computing Output Impacts on Industries



computer requires slightly over two minutes to calculate the impact of changes in demand on all industries in the state.

Examples of actual impact studies are contained in the latter part of the chapter. A more rigorous treatment of the technique may be found in the mathematical portion of Chapter 3.

Income Multipliers

A second approach to measuring the impact of economic events on industries of the Kansas economy is through income multipliers.

The income multiplier technique requires the use of a fourth matrix which appears in the appendix entitled Direct, Indirect, and Induced Requirements Matrix. This matrix includes both the household row and column and is similar in interpretation to the matrix of direct and indirect requirements. However, included in the expanded matrix are the effects of additional consumer income and expenditures.

This matrix considers not only the effects of additional purchases from other industries but also the additional income to households which enables consumers to spend more which represents additional demand for the output of most state industries.

The values in row 70 show the amount of total additional income resulting from a one dollar change in output in the column industry. These values are

a type of multiplier in that they relate income generated by a one dollar increase in output in a particular industry. A summary of these values is contained in Table 10-2 and also in row 70 of the Direct, Indirect, and Induced Requirements Matrix.

An additional multiplier formulation relates total income change to initial income change. In the household row the matrix of direct requirements indicated the amount of income paid to households directly by the column industry. If the values in Table 10-2 are divided by the corresponding values in the household row of the direct requirements matrix, the result is an income multiplier of the type summarized in Table 10-3.

In addition to the multiplier indices, the matrix of Direct, Indirect, and Induced effects can be used in the same manner as was described in the previous section except the household column is excluded from the final demand vector because it was included in the matrix.

Table 10-2

DIRECT, INDIRECT, AND INDUCED INCOME CHANGES RESULTING FROM A ONE DOLLAR CHANGE IN DELIVERY TO FINAL DEMAND

Corn	0.749904	Grain Mill Products	0.472813
Sorghum	0.764852	Other Food & Kindred Products	0.433528
Wheat	0.767985		
Other Grains	0.803092	Appare1	0.543655
Soybeans	0.861766	Paper & Allied Products	0.440163
Hay	0.979334	Printing & Publishing	0.517053
Dairy Products	0.699993	Industrial Chemicals	0.340417
Poultry & Poultry Products	0.757975	Agricultural Chemicals	0.295333
·		Other Chemicals	0.334758
Cattle	0.714726	Petroleum & Coal Products	0.329487
Hogs	0.708472	Rubber & Plastics	0.316050
Other Agricultural Products	0.679883	Cement & Concrete	0.511537
Agricultural Services	0.602359		
Crude Oil & Natural Gas	0.382486	Other Stone & Clay	0.579009
Oil & Gas Field Services	0.975247	Primary Metals	0.435279
Nonmetallic Mining	0.355188	Fabricated Metals	0.457454
Other Mining	0.355007	Other Fabricated Metal Products	0.441835
Maintenance & Repair	0.443651	Farm Machinery	0.442198
Building Construction	0.485541	Construction Machinery	0.502736
Heavy Construction	0.704142	Food Products Machinery	0.484086
Special Trade Construction	0.443651	Electrical Machinery	0.398414
Meat Products	0.710349	Other Machinery	0.511037
Dairy Products	0.613504	Motor Vehicles	0.369936

Aerospace	0.655191	Farm Equipment Dealers	0.843312
Trailer Coaches	0.370268	Gasoline Service Stations	0.943521
Other Transportation Equipment	0.103896	Eating & Drinking	0.767301
Other Manufacturing	0.483029	Other Retail Trade	0.854149
Railroad Transportation	0.668700	Banking	0.823536
Motor Freight	0.399121	Other Finance	0.905670
Other Transportation	0.451096	Insurance & Real Estate	0.767061
Communications	0.615078	Lodging Services	0.659495
Electric Gas & Sanitary		Personal Services	0.975425
Services	0.682891	Business Services	0.587066
Groceries	0.874135	Medical & Health Services	0.850652
Farm Products	0.659372	Other Services	0.774021
Machinery & Equipment	0.712726	Education	1.043874
Other Wholesale Trade	1.065846	Households	1.373255

Table 10-3

INCOME MULTIPLIERS: RATIO OF INITIAL INCOME EFFECT TO TOTAL INCOME EFFECT

Se	ctor	Multiplier
1.	Corn	1.669853
2.	Sorghum	1.708417
3.	Wheat	1.798618
4.	Other Grains	1.768416
5.	Soybeans	1.729307
6.	Нау	1.558831
7.	Dairy Products	3.386584
8.	Poultry & Poultry Products	1.803633
9.	Cattle	5.001746
10.	Hogs	3.291745
11.	Other Agricultural Products	2.237196
12.	Agricultural Services	1.862006
13.	Crude Oil & Natural Gas	4.577211
14.	Oil & Gas Field Services	1.786405
15.	Nonmetallic Mining	3.735876
16.	Other Mining	3.607454
17.	Maintenance & Repair	n.d.*
18.	Building Construction	3.110438
19.	Heavy Construction	1.923307
20.	Special Trade Construction	1.752181
21.	Meat Products	6.948381
22.	Dairy Products	4.733268
23.	Grain Mill Products	7.179258
	*n.d. = not defined	

Sec	tor	Multiplier
24.	Other Food & Kindred Products	3.083890
25.	Apparel	1.420892
26.	Paper & Allied Products	1.648554
27.	Printing & Publishing	1.522298
28.	Industrial Chemicals	1.766516
29.	Agricultural Chemicals	1.769881
30.	Other Chemicals	1.850250
31.	Petroleum & Coal Products	4.992734
32.	Rubber & Plastics	1.572335
33.	Cement & Concrete	1.863949
34.	Other Stone & Clay	1.525700
35.	Primary Metals	1.557425
36.	Fabricated Metals	1.505374
37.	Other Fabricated Metal Products	1.594097
38.	Farm Machinery	1.697356
39.	Construction Machinery	1.702190
40.	Food Products Machinery	1.563050
41.	Electrical Machinery	1.568493
42.	Other Machinery	1.487759
43.	Motor Vehicles	1.535807
44.	Aerospace	1.472730
45.	Trailer Coaches	2.002357
46.	Other Transportation Equipment	1.464673

Sec	ctor	Multiplier
47.	Other Manufacturing	1.620854
48.	Railroad Transportation	1.519245
49.	Motor Freight	1.696108
50.	Other Transportation	1.752595
51.	Communications	1.961336
52.	Electric Gas & Sanitary Services	2.077923
53.	Groceries	1.655767
54.	Farm Products	2.200621
55.	Machinery & Equipment	1.847849
56.	Other Wholesale Trade	1.478760
57.	Farm Equipment Dealers	1.836100
58.	Gasoline Service Stations	1.975727
59.	Eating & Drinking	1.878326
60.	Other Retail Trade	1.826629
61.	Banking	1.568176
62.	Other Finance	1.532657
63.	Insurance & Real Estate	1.737091
64.	Lodging Services	2.082056
65.	Personal Services	1.557749
66.	Business Services	2.020341
67.	Medical & Health Services	1.598062
68.	Other Services	1.675272
69.	Education	1.556211

Examples of Impact Measurement

Two examples of hypothetical, but typical, changes in final demand are presented in this section to illustrate impact analysis. The first example examines the effects of a \$10 million increase in demand for meat products. The second example traces the impact of a \$100 million cut in federal government purchases of airplanes.

In Example 1 the output increases required of each state industry are detailed in the three columns. Each column is obtained by multiplying \$10 million by the values in column 21 of the three matrices identified by the column labels in the example. Many industries supply nothing directly to the Meat Packing industry but nearly all are affected in some magnitude. For instance, the Meat Packing industry makes no direct purchase from the Corn sector but because increased meat production requires more cattle and cattle are fed on corn, the Corn sector must increase its output \$544,740, or \$556,280 when induced effects also are considered.

The total direct, indirect, and induced effects of the \$10 million increase in final demand for meat products is a \$36,876,530 increase in the output of all state industries.

Although payments to Households by the Meat Products industry increase \$1,022,320, total income increases are about seven times as large or \$7,103,490.

In Example 2 the direction of change in final demand is larger and in the opposite direction. However, the procedure is the same as in the example above. Total output of all state industries decreases by \$210,549,190.

Personal income falls by \$65,519,100.

Example 1. Suppose the meat packing industry experienced an increased demand for its output of \$10 million. What would be the output increases in each state industry in order to provide the necessary inputs? What would be the total output impact on the Kansas economy? What would be the total personal income increase?

	Direct	Direct & Indirect	Direct, Indirect & Induced
Industry	Requirements	Requirements	Requirements
Corn	-	544,740	556,280
Sorghum	-	1,074,380	1,094,390
Wheat	-	227,530	235,200
Other Grains	-	6,860	7,430
Soybeans	-	13,370	27,850
Нау	720	1,207,290	1,225,900
Dairy Products	1,090	2,410	43,970
Poultry & Poultry Products	143,920	150,640	154,480
Cattle	5,341,510	7,005,830	7,100,460
Hogs	1,390,700	1,514,180	1,535,620
Other Agricultural Products	102,750	140,860	152,610

<u>Industry</u>	Direct Requirements	Direct & Indirect Requirements	Direct, Indirect & Induced Requirements
Agricultural Services	-	303,450	314,030
Crude Oil & Natural Gas	-	73,540	190,150
Oil & Gas Field Services	-	7,640	19,770
Nonmetallic Mining	-	150	770
Other Mining	-	3,600	10,110
Maintenance & Repair	6,670	76,410	169,130
Building Construction	<u>=</u>	-	-
Heavy Construction	量	660	1,730
Special Trade Construction	-	4,070	182,130
Meat Products	439,790	10,464,420	10,597,100
Dairy Products	=	1,590	75,010
Grain Mill Products		708,440	728,850
Other Food & Kindred Products	1,140	82,370	171,520
Apparel	-	2,210	6,850
Paper & Allied Products	60,730	97,810	108,160
Printing & Publishing	2,730	20,920	60,320

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Industry	Direct Requirements	Direct & Indirect Requirements	Direct, Indirect & Induced Requirements
Industrial Chemicals	-	205,800	211,600
Agricultural Chemicals	-	12,680	16,890
Other Chemicals	-	13,350	49,100
Petroleum & Coal Products	1,090	103,760	297,350
Rubber & Plastics	=	1,780	5,800
Cement & Concrete	-	1,340	9,130
Other Stone & Clay	=	1,730	20,770
Primary Metals	變	2,280	5,640
Fabricated Metals	-	1,090	7,260
Other Fabricated Metal Products	~	4,990	12,870
Farm Machinery	-	48,630	56,150
Construction Machinery	<u> </u>	1,560	4,120
Food Products Machinery	180	1,890	4,610
Electrical Machinery	-	1,200	4,730
Other Machinery	·	4,450	9,550
Motor Vehicles	-	130	370

<u>Industry</u>	Direct Requirements	Direct & Indirect Requirements	Direct, Indirect & Induced Requirements
Aerospace	-	30	2,420
Trailer Coaches	-	1,380	10,630
Other Transportation Equipment	-	510	2,640
Other Manufacturing	-	6,730	21,410
Railroad Transportation	33,860	64,440	110,230
Motor Freight	64,580	126,330	152,060
Other Transportation	-	2,560	26,810
Communication	5,940	60,100	155,950
Electric Gas & Sanitary Services	16,110	125,700	337,910
Groceries	11,850	26,490	56,000
Farm Products	80,610	217,220	230,670
Machinery & Equipment	64,340	107,590	130,370
Other Wholesale Trade	97,400	413,820	477,630
Farm Equipment Dealers	-	127,880	131,760
Gasoline Service Stations	-	25,170	92,260
Eating & Drinking	-	7,860	191,590

Industry	Direct Requirements	Direct & Indirect Requirements	Direct, Indirect & Induced Requirements
Other Retail Trade	æ	3,800	478,070
Banking	39,310	85,610	185,380
Other Finance	30	7,530	321,970
Insurance & Real Estate	63,730	136,010	359,350
Lodging Services	1-	7,470	28,370
Personal Services	300	36,190	278,260
Business Services	6,220	40,470	57,250
Medical & Health Services	=	1,160	326,300
Other Services	13,240	37,730	84,230
Education	-	820	37,760
Househo1ds	1,022,320	% <u>~</u>	7,103,490
Gross Savings	49,680	-	-
Federal Government	19,380	-	-
State Government	13,150	-	-
Local Government	5,210	-	-
Imports	899,710		
TOTAL	10,000,000	25,812,630	36,876,530

Example 2. Suppose the federal government reduced its purchase of airplanes and related components from Kansas firms by \$100 million. What would be the output decreases in each state industry as a result of this cut back? What would be the total output reduction? How would state personal income be affected?

	Direct	Direct & Indirect	Direct, Indirect & Induced
<u>Industry</u>	Requirements	Requirements	Requirements
Corn	-	600	107,100
Sorghum	-	1,100	185,600
Wheat	-	500	71,200
Other Grains	-	400	5,600
Soybeans	-	600	134,100
Нау	-	1,400	173,000
Dairy Products	-	1,500	384,800
Poultry & Poultry Products	-	300	35,700
Cattle	-	5,800	878,400
Hogs	-	1,200	198,900
Other Agricultural Products	400	7,600	115,800

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<u> </u> Industry	Direct Requirements	Direct & Indirect Requirements	Direct, Indirect & Induced Requirements
Agricultural Services	Œ	700	98,200
Crude Oil & Natural Gas	-	155,560	1,229,900
Oil & Gas Field Services	-	16,200	127,900
Nonmetallic Mining	100	600	5,900
Other Mining	~	20,600	80,600
Maintenance & Repair	72,000	186,300	1,040,500
Building Construction	·-	-	- 1
Heavy Construction	-	4,300	12,400
Special Trade Construction	17,300	41,000	1,153,600
Meat Products		8,500	1,123,190
Dairy Products	-	2,800	679,900
Grain Mill Products	> -	1,400	189,500
Other Food & Kindred Products	-	3,700	825,900
Apparel	5,900	7,400	50,100
Paper & Allied Products	26,700	46,300	141,300
Printing & Publishing	260,800	309,900	672,800

Industry	Direct Requirements	Direct & Indirect Requirements	Direct, Indirect & Induced Requirements
Industrial Chemicals	10,600	13,000	66,500
Agricultural Chemicals	1,200	3,200	42,000
Other Chemicals	142,500	160,200	479,700
Petroleum & Coal Products	114,000	165,200	1,948,900
Rubber & Plastics	183,400	187,600	224,700
Cement & Concrete	, E	1,400	66,800
Other Stone & Clay	11-	2,500	171,000
Primary Metals	109,300	121,100	148,000
Fabricated Metals	23,100	28,500	72,900
Other Fabricated Metal Products	131,300	145,900	207,700
Farm Machinery	y ≅	3,000	72,300
Construction Machinery	1,900	2,800	26,400
Food Products Machinery	:-	2,500	27,600
Electrical Machinery	150,100	158,500	185,900
Other Machinery	1,920,800	1,946,600	1,993,200
Motor Vehicles	100	100	2,300

<u>Industry</u>	Direct Requirements	Direct & Indirect Requirements	Direct, Indirect & Induced Requirements
Aerospace	603,000	100,617,000	100,639,100
Trailer Coaches	-	800	86,100
Other Transportation Equipment	-	3,400	23,100
Other Manufacturing	225,100	243,000	373,900
Railroad Transportation	286,900	420,900	842,300
Motor Freight	17,100	95,300	331,800
Other Transportation	26,500	33,100	254,400
Communication	467,400	648,000	1,530,500
Electric Gas & Sanitary Services	638,300	894,000	2,848,900
Groceries	: -	7,500	279,600
Farm Products	<u> 2</u>	8,200	132,200
Machinery & Equipment	1,407,900	1,460,200	1,668,200
Other Wholesale Trade	82,100	112,000	695,200
Farm Equipment Dealers	-	300	36,000
Gasoline Service Stations	800	12,900	629,700
Eating & Drinking	27,800	72,800	1,767,000

Industry	Direct Requirements	Direct & Indirect Requirements	Direct, Indirect & Induced Requirements
Other Retail Trade	100	6,800	4,380,900
Banking	146,400	193,000	1,110,700
Other Finance	5,700	12,100	2,911,600
Insurance & Real Estate	·-	75,000	2,131,500
Lodging Services	39,600	79,700	272,100
Personal Services	41,800	81,800	2,314,100
Business Services	128,500	180,800	335,200
Medical & Health Services	5,500	9,700	3,007,100
Other Services	130,600	197,100	623,000
Education	5,100	7,500	348,100
Households	44,488,200	-	65,519,100
Gross Savings	2,909,000	-	~
Federal Government	4,744,400	-	-
State Government	284,100	-	-
Local Government	205,700	-	-
Imports	39,910,900	-	_
TOTAL	100,000,000	109,241,260	210,549,190

Chapter 11

AN ABRIDGED METHODOLOGY FOR CONSTRUCTING THE KANSAS INPUT-OUTPUT STUDY

A number is relatively meaningless without some labels to identify its purpose and its origin. Thus, this chapter explains the procedures used in arriving at the appropriate numbers with which to measure the economic structure of the Kansas economy via a regional input-output study. Since a complete methodology would interest only a few persons, an abridged methodology is presented in this chapter.

That the overall study is a comprehensive one can be seen by citing a few statistics. First, the Kansas transactions matrix contains 5,775 cells in its 75 rows and 77 columns. Second, the majority of the data were obtained by personal interview with business establishments. Third, the study took two years and \$120,000 to complete.

Approaches to Implementing an Input-Output Matrix

The data appetite of an input-output matrix is substantial. The number of potential data cells rises exponentially as the matrix is expanded, and each matrix cell represents a summary of from several dozen to several hundred data items. Because of these large data requirements, a variety of approaches have been used in implementing regional input-output matrices. Before presenting the general methodology used in implementing the Kansas matrix, it would be useful to examine these varied techniques in order to understand the similarities and differences of the Kansas study.

Regional input-output studies may be classified into two categories: primary data studies and secondary data studies.

Primary data studies are those which utilize data obtained from individual firms specifically for the input-output study and usually employ a sampling procedure designed for each industry group to be surveyed. They are both more accurate and more expensive than the secondary data studies. Although no study utilizes only primary data, those that rely essentially on survey data are generally considered primary data studies.

The survey approach also permits a valuable short cut by utilizing double entry bookkeeping techniques. A matrix cell reflects both a "sale" by a "producer" and a "purchase" by a "purchasing" industry; consequently an adequate index to input-output activity may be compiled by gathering sales or purchase data from an industry rather than both. When a study obtains only sales information, it is called a "rows only" input-output study. When only purchase data are sought, the label "columns only" is applied.

Secondary data studies may use several techniques to construct regional input-output tables. The use of adjusted national coefficients to approximate regional coefficients is the most frequent one. The adjustment process varies, but the Moore-Petersen approach gave impetus to the practice of constructing regional input-output tables by adjusting national coefficients. Location quotients, the Leontief-Stroud approach, and the production vs. requirements approach have all been attempts at constructing regional input-output tables from secondary data. More secondary data studies than primary data ones have been undertaken because of their low cost. However, their validity remains unsubstantiated.

A Methodological Overview

Most of the Kansas input-output matrix was based on survey data. Of the 69 processing sectors only the four retail trade sectors did not use survey data.

The sampling strategy, which is discussed in each industry group below, stratified firms by size and Standard Industrial Classification subsectors. In most industry groups all of the large firms were included in the sample. For instance, in the manufacturing industries all firms employing more than 25 persons were included in the sample survey. Collectively they accounted for about 90 per cent of total manufacturing output.

Both sales and purchases information was obtained by personal interview with firms. Because of sampling errors, variable response rates, and differences in accounting periods, the amount that an industry sold to another industry was not exactly equal to the amount that the purchasing industry indicated that it bought from the selling industry. These differences resulted in the necessity of reconciling the sales and purchase matrices in light of other data.

Since the Office of Economic Analysis has statutory authority to gain access to all information gathered by state agencies, these data sources were used to supplement the samples and to check the accuracy of the information obtained by personal interview.

With the exception of farming, all data were obtained on an establishment basis, and all of the output of an establishment is assigned to the industry of its primary output. This is the typical reporting mechanism of nearly all statistical reporting units.

Output estimates were obtained initially from published data. However, many of these were revised on the basis of the survey data.

General Survey Procedures

With the aid of the firm lists of the Kansas State Labor Department, Employment Security Division, the universe of firms in the state was determined. The Standard Industrial Classification 4-digit codes assigned by the Employment Security Division were used to assign firms to sectors. A few had to be reclassified after the survey. Firms employing less than four persons were not included in the list; however, their omission is unimportant in the study.

An adequate use of news media prepared the state's industry for the survey interviews. A press release explaining the purpose of the study was distributed to the state's newspapers. The news departments of radio and television stations carried interviews with the Chief Economist concerning the purpose of the study. A few days prior to the contact by the interviewer, letters were sent to the firms being contacted to explain the purpose of the interview.

Although the interviewing continued through the summer of 1967 in some sectors, the major portion of the interviewing was completed during the summer of 1966. The amount of time spent with each firm ranged from 30 minutes to three weeks.

The questionnaires used for each sector are included in the discussion below. Individual questionnaires were designed for each major industry group. Most of the questionnaires sought a complete detailing of a firm's sales and purchases in accord with the study's sectors. However, a few, such as construction, requested only limited information to supplement existing data on the industry.

The remainder of this chapter presents the methodology employed in constructing the Kansas input-output matrix.

FARM SECTORS

Input Coefficients

Relative to its size, probably no sector of the economy has as much data available on its performance as farming. Despite this numeric mass the task of ascertaining the input structure for the crop and livestock sectors of the Kansas economy was no less difficult than any of the other sectors. As Hackbart* demonstrated, there are numerous missing data pieces which remain after the mountain of secondary data is filtered through an input-output matrix. Consequently, implementation of the input structure of the Kansas farm sectors relied heavily on survey data obtained by the extension service at Kansas State University.

The initial data source for the farming sectors was the survey data obtained annually through the Farm Management Associations. This survey was supplemented by individual sector research studies primarily when disaggregation was required. Summary data were available from each of the six Farm Management Associations**as well as the individual farm firm records.

The sample of farm firms included in Farm Management Association records was about 2400 farm units. These are compiled annually by Kansas State University extension economists. Since the sample is biased in the direction of the more efficient enterprises, an adjustment was made to correct for this tendency.

Unlike the other sectors of the matrix, the farm sectors were not

^{*}Merlin M. Hackbart, Regional Input-Output Impact Analysis: An Evaluation and a Secondary Data Approach, (Unpublished Ph.D. dissertation) Kansas State University, 1968.

^{**}For a survey of the types of data available, see <u>Farm Management</u> <u>Summary and Analysis Report</u>, Extension Service, Kansas State University, <u>Manhattan</u>, Kansas, 1965.

classified on an establishment basis but rather on a crop and livestock group. Thus, if a farm unit raised both corn and cattle, the costs associated with producing the corn and the output distribution of the corn would be assigned to the corn sector and similarly with the cattle.

The Farm Management summary data yielded the following relevant purchase information for major crops and livestock:

Feed bought
Fuel and oil
Machinery repairs
Trucking and machine hire
Veterinary and livestock expense
Fertilizer and annual lime expense
Seed and crop expense
Telephone and electricity expense
Farm organization fees, etc.
Taxes, cash rent, interest, and insurance
Repairs on permanent improvements
Depreciation
Net farm income

These provided an aggregate input structure, but two additional steps were required in order to meet the specifications of the matrix. First, many of the categories required disaggregation in order to conform to the more detailed sectors of the input-output matrix. Second, imports needed to be estimated for each input to obtain a total import value.

The disaggregation utilized three data sources. First, the reports completed to the farm operators contained more detailed information than the summary categories outlined above. These records were examined only for the data that would permit further disaggregation. For instance, it was possible to separate the category of Taxes, Cash Rent, Interest, and Insurance into four separate categories because these items had been reported separately on the individual farm unit records. Second, a few detailed studies were available on the input structure of some of the sectors. Such studies were

particularly useful in disaggregating feed costs into the four categories defined in the matrix. The data were also adjusted for the value of feed grown by farm operator, including pasture. The studies used are cited at the end of this section. Third, sales by other industries to agriculture were obtained by survey. These data filled several voids which remained after disaggregating the FMA data as described above.

Because of the data sources employed in constructing the inputs to farming, the determination of imports utilized a different procedure than was used for industries with a complete survey base. Total requirements were established by the FMA data. These were then compared with the quantities of imports sold to the farm sectors according to the survey data. The residual provided the basis for the import value.

Although the remaining 58 sectors were constructed on the basis of relative 1965 prices, the farming sectors were modified to smooth out some of the extreme price fluctuations which are prevalent in the industry. This was accomplished by computing the input coefficients on the basis of a five year average. This procedure seemed preferable to using a single year which might be viewed as atypical.

Market Structure

The distribution of farm output to the 59 processing sectors and the seven final demand sectors utilized both survey data and published data.

Sales to other farm sectors were determined by the input requirements of the sectors to which the farm sector was selling.

Sales to manufacturing, trade, and service sectors were obtained from survey data of the purchases of the firms in these three groups.

Final demand sales were obtained from government reports on government purchases and private foreign export sales. Data sources for final sales are

presented below.

References

- (1) Kansas Farm Facts. 1966
- (2) Farm Management Association Summary Report
- (3) Farm Income. USDA Report
- (4) 1964 Census of Agriculture

Output Estimates

The Statistical Reporting Service of the U. S. Department of Agriculture annually provide both volume and value of production for all crop and livestock groups. These were used as the output estimates for the farm sectors. The output values and composition of each sector was presented in Chapter 4.

MINING SECTORS

Input Coefficients

The determination of the input coefficients for the three mining sectors was a blend of three data sources. First, the U. S. Bureau of Mines completed a 48 sector disaggregation of the mining industries for the nation in 1967 based on the 1958 U. S. input-output table. Because of the detail offered by this study, a useful benchmark was available. Second, the Kansas Geological Survey publications provided numerous parts of the required input structure. Third, a limited survey of the industry was undertaken primarily to determine imports and exports.

The Bureau of Mines study was used as a major point of reference in constructing the columns for the three Kansas mining groups. A sample of firms and the Kansas Geological Survey were querried for differences in the Kansas input structure. Imported inputs were determined from the same two sources.

The Crude Oil and Natural Gas sector is a combination of S.I.C. 1311, and 1321. The relative size of each was presented in Chapter 4.

Oil and Gas Field Services includes all 4-digit parts of S.I.C. 138.

This is a relatively more important industry in Kansas than the nation;

consequently, the Bureau of Mines data was supplemented with survey to correct

the structure of the industry to reflect the Kansas input coefficients.

Nonmetallic mining and other mining consisted of a composite of S.I.C. groups as indicated in Chapter 4.

^{*}Kung-Lee Wang and Robert G. Kokat. The Interindustry Structure of the U. S. Mining Industries-1958, Bureau of Mines Information Circular 8338. (Washington: 1967).

Market Structure

In-state markets for the output of the mining industries were determined from the survey data on the purchases of the other state industries. Although some data were obtained from survey data of the mining firms, the purpose of the survey was limited to determining imports and exports.

Output Estimates

The published output estimates of the Kansas Geological Survey for mineral products were used as the source of the output values.

CONSTRUCTION SECTORS

Undoubtedly the most difficult industry group for an input-output study is the construction industry. The high variability of the activity level and composition of the industry has plagued most researchers attempting to construct a picture of the current status of the industry or, alternatively, a typical year for the construction industry.

Input Coefficients

A two-stage survey was conducted to provide the data base for the input coefficients for the sector. Initially, the largest firms in the industry were interviewed using a questionnaire which was nearly identical to the one used for manufacturing firms. Next, a larger sample of the smaller firms was employed. This second-stage sample sought only limited information, but was augmented by data on total sales and cost of goods sold from other sources available only to the Office of Economic Analysis. The total sample included 132 firms.

Market Structure

Because of the relatively small sample size, particularly in Special Trade Construction, purchase data from other industries provided the main basis for identifying in-state markets. Since most of the output of the construction industry is sold to Gross Private Investment, this posed no serious problem.

Output Estimates

Value of construction data was obtained from the following three sources:

- (1) Department of Commerce, Bureau of the Census, "Construction Reports," 1966.
- (2) Department of Commerce, Bureau of the Census, "Construction Review," 1966.
- (3) F. W. Dodge Company, 'Dodge Construction Contract Statistics Service,' McGraw-Hill, 1966.

MANUFACTURING SECTORS

The manufacturing sectors represent the largest group of industries (27) and more than one-half of the effort in constructing the input-output matrix.

Input Coefficients

Data to measure the input structure of each manufacturing industry in the state were obtained from personal interviews of a sample of firms in each industry. The sample was designed to include all firms employing more than 25 employees. In addition, a stratified random sample of smaller firms was drawn. The stratification was on the basis of firm size and Standard Industrial Classification.

A total of 715 firms was included in the sample. Usable data were obtained from 517 of these firms. The remainder either did not cooperate or provided insufficient information. The sample output, total output, and coverage ratios are contained in Table 9-1. These vary from 92.6 per cent to 22.4 per cent. The low ratio in the latter category occurred because of a large number of small firms in the industry.

Two stages were involved in constructing an input flow matrix for manufacturing. First, some inputs were too aggregated to satisfy the detail required in the matrix. Where this occurred, it was necessary to allocate a purchase category to two or more sectors on the basis of the input structure of the other firms in the same S.I.C. 4-digit group. Examples of the purchase categories requiring disaggregation are office supplies, travel expenses, agricultural raw materials, and unidentified purchases from manufacturing. Second, using 4-digit S.I.C. outputs wherever possible, the sample data was inflated to the total output figures for the S.I.C. subgroups and then aggregated to the sector total. Since coverage rates in the sample varied

within subgroups of the sector, this procedure was necessary to prevent subsector bias and to attain consistency with the stratification procedure employed in the sampling.

An output flow matrix was constructed in a similar manner. A few sales categories required allocation followed by the calculation of inflators to adjust the sample to the output control totals.

The allocation procedure and the sample inflation procedure was computerized to facilitate handling the mass of data and also to enable updating the study by adding and deleting firms.

These procedures resulted in the determination of an input matrix and an output matrix for the 27 manufacturing industries. Two figures appeared in each cell of the combined matrix which ideally would be identical. However, because of differences in accounting periods and sampling discrepencies, these two entries deviated from one another. Reconciling the discrepency involved considering the two factors mentioned above.

Output Estimates

Output estimates for the manufacturing industries were obtained from four sources

- (1) 1965 Survey of Manufactures, U. S. Department of Commerce, 1968.
- (2) 1963 Census of Manufactures, U. S. Department of Commerce, 1965. Changes in wages paid were used to adjust the 1963 output figures.
- (3) The U. S. Department of Commerce complied with a special request for additional data.
- (4) The survey data indicated that the output of several industries required adjustment from published data.

Table 11-1

MANUFACTURING SECTOR TOTAL OUTPUT,
SAMPLE OUTPUT, AND SAMPLE/TOTAL OUTPUT

	Sector	Total Output	Sample Output	Sample/Total <u>Output</u>
21.	Meat Products	\$590,639	\$396,933	.672
22.	Dairy Products	121,711	71,898	.591
23.	Grain Mill Products	333,728	216,648	.649
24.	Other Food & Kindred Products	207,100	124,198	.600
25.	Apparel & Related Products	38,066	20,194	.530
26.	Paper & Allied Products	75,582	56,189	.743
27.	Printing & Publishing	119,080	48,768	.410
28.	Industrial Chemicals	153,654	89,987	. 586
29.	Agricultural Chemicals	16,605	10,768	.648
30.	Other Chemicals	229,897	137,554	.598
31.	Petroleum & Coal Products	580,338	281,910	.486
32.	Rubber & Plastic Products	151,718	143,555	.946
33.	Cement, Concrete & Plaster Pro	d. 76,168	49,041	.644
34.	Other Stone, Clay & Glass Prod	. 96,544	21,626	.224
35.	Primary Metal Industries	31,405	18,354	.590
36.	Fabricated Metal Products	69,922	56,154	.803
37.	Other Fabricated Metal Prod.	75,057	53,671	.715
38.	Farm Machinery & Equipment	51,621	34,825	.675
39.	Construction Machinery	47,839	30,857	.645

	Sector	Total Output	Sample Output	Sample/Total <u>Output</u>
40.	Food Products Machinery	26,770	10,699	.400
41.	Electrical Machinery	43,367	25,537	.589
42.	Other Machinery	127,232	78,837	.620
43.	Motor Vehicles & Equipment	223,244	208,672	.926
44.	Aerospace	561,134	512,694	.914
45.	Trailer Coaches	42,313	37,422	.884
46.	Other Transportation Equipment	44,344	21,617	.487
47.	Other Manufacturing	59,440	24,216	.407

TRANSPORTATION SECTORS

Input Coefficients

The data required to estimate the inputs of the transportation sectors were obtained from two sources: surveys of firms in the industry and from reports filed with the Kansas Corporation Commission. Motor freight and passenger carriers were interviewed on a sample basis in order to determine all input coefficients. Railroads, however, were interviewed only to supplement data obtained from Kansas Corporation Commission reports. Data for pipeline operations were obtained entirely from published reports of the Kansas Corporation Commission.

Market Structure

In the accounting scheme employed in the input-output matrix, transactions are recorded in producer's prices as explained in Chapter 3. Thus, transportation costs are assigned as a purchase to the industry making the materials purchase. The assignment of the transportation costs to the purchasing industry rather than the producing industry is made irregardless of the actual payer.

Because of the accounting definition, the market structure of the transportation industry is determined largely by purchasing industry data and by transportation rate structures which would be applicable to the purchasing industry. For instance, the transportation expenses in Crude Oil and Natural Gas column represent only the cost of acquiring the necessary inputs to the industry. Costs of transporting the output are charged to the purchasing industry.

Output Estimates

Output estimates for the transportation sectors were obtained from the following sources:

- Kansas Corporation Commission, <u>Twenty-Eighth Report</u>, (Topeka, Kansas: State Printing Office, 1966).
- Interstate Commerce Commission, Transport Statistics in the United States, (Washington: U. S. Government Printing Office: 1966).
- Department of Commerce, Bureau of the Census, 1963 Census of Transportation: Commodity Transportation Survey, (Washington: U. S. Government Printing Office: 1966).
- Department of Transportation, Federal Avaiation Administration, FAA Statistical Handbook of Aviation, (Washington: U. S. Government Printing Office: 1966).

PRIVATE UTILITIES

Input Coefficients

Data from personal interviews of a sample of firms in these two industry groups formed the basis for determining the input structure of these industries. Utilities operated by local units of government were not included in this sector, but rather were defined as part of the local government sector.

Market Structure

A combination of sales data from the utilities and purchase data from their customers was used to estimate the output patterns of these two industries. For instance, gas and electric utilities were usually able to provide detail on their industrial users. However, firm purchases were more-reliable for telephone and telegraph.

Output Estimates

A variety of sources were used in constructing total output estimates for each industry group.

Kansas Corporation Commission, <u>Twenty-Eighth Report</u>, (Topeka, Kansas: State Printing Office, 1966).

Federal Communication Commission, <u>Annual Report</u>, (Washington: U. S. Government Printing Office, 1966).

Federal Communication Commission, <u>Statistics of Communication Common</u> Carriers, (Washington: U. S. Government Printing Office, 1966).

Federal Communication Commission, <u>TV Broadcast Financial Data</u> and <u>AM-FM Broadcast Financial Data</u>, (Washington: U. S. Government Printing Office, 1966).

WHOLESALE TRADE

Input Coefficients

Interviews, obtained from a random sample of firms, yielded the data necessary to construct input coefficients for wholesale trade. These, of course, were reconciled with sales data from other industries. Inputs did not include goods purchased for resale as explained in Chapter 3. Only the purchases included in the firm's "margin" were included. The margin is a more accurate measure of the service provided by the firm.

Market Structure

Survey data was used almost exclusively in determining the market structure of the wholesale trade sectors. Firms in other industries were instructed to by-pass wholesalers and retailers in identifying industrial sources of inputs. Thus, prime reliance was placed on wholesale trade sales data.

Output Estimates

Total sales of each Wholesale Trade sector were obtained by adjusting sales reported in the 1963 Census of Business by the ratio of wages paid in the sectors in 1963 and 1965 and corresponding retail trade growth. Margins were computed from the interview data and applied to the total sales estimates.

The following sources were used:

Department of Commerce, Bureau of the Census, <u>U. S. Census of Business</u>: <u>1963-Kansas</u>, (Washington: U. S. Government Printing Office, 1966).

Employment Security Division, Kansas State Department of Labor, unpublished wage data.

Kansas Department of Revenue, <u>Sales Tax Collections by Type of Business</u>, (Topeka, Kansas: mimeographed, 1966).

RETAIL TRADE

Because of the large number of firms engaged in retail trade, and because of the availability of secondary data, retail trade establishments were not surveyed. Coefficients were derived from several studies and regular statistical series.

All retail sectors, except Eating and Drinking Establishments, were handled on a margin basis. Since Eating and Drinking Establishments change the form of the good which they sell, they are manufacturers and are treated as such in the matrix.

The sources utilized in estimating coefficients for retail trade as well as output estimates are summarized below.

Department of Commerce, Bureau of the Census, <u>U. S. Census of Business:</u>
1963, Retail Trade-Kansas, (Washington: U. S. Government Printing
Office, 1966).

Kansas Department of Revenue, <u>Sales Tax Collections by Type of Business</u>, (Topeka, Kansas: mimeographed, 1966).

Robert Morris Associates, <u>Annual Statement Studies</u>, (Philadelphia: Robert Morris Associates, 1967).

Goldman, Morris, R., Martin Marimont, and Beatrice H. Vaccara, "The Interindustry Structure of the United States," <u>Survey of Current Business</u>, Vol. 44, No. 11, (November 1964).

Miernyk, William H., Ernest Bonner, John H. Chapman, Jr., and Kenneth Shellhammer, The Impact of Space and Space-Related Activities on a Local Economy, Part I: The Input-Output Analysis, (Boulder: University of Colorado, 1965).

FINANCE, INSURANCE AND REAL ESTATE

The Banking Sector consists of total banking establishments in the state as listed by the 1965 bank directory. In 1965 there were 602 banks in Kansas showing total assets of \$3,776,879,896.

Total output for banking is defined as total income of the banks, which consists of interest income, investment income, rent and other miscellaneous incomes. Total output was obtained by expanding the sample output to the total income for banks.

In order to arrive at the interindustrial ties with banking, questionnaires were sent to a selected number of banks. If the banks showed over \$15,000,000 in total assets, personal interviews were conducted in place of the mail questionnaire.

The Insurance Sector consists of companies underwriting life, accident and health, and a multiplicity of non-life insurance risks. This sector also includes insurance agents and insurance services. The output of this sector is defined as total income of the members listed above. Totals were given in the 1965 report of the insurance commission.

Information for this sector was obtained from the annual reports filed at the insurance commissioner's office, by all insurance carriers doing business in Kansas. For accident and health and life insurance carriers, the information was listed in the desired form. A short questionnaire was mailed to those that did not give the desired information, particularly source of income and exports. A similar approach was used to determine the types of risks underwritten by non-life carriers. In general, the non-life carriers listed only the loss or premium receipt by type of insurance rather than the type of business insured. Thus, the supplementary questionnaire

was needed for all the non-life carriers.

The sample of non-life carriers for Kansas consisted of the 20 largest companies of a total of 26. The sample was then expanded to the total output by the proper inflator. The sample for life insurance carriers also consisted of the twenty largest companies. These companies were then used as the basis for forming the insurance row and column. The insurance carriers based out of Kansas were then added into the row and column; their expenses being added directly with that of the Kansas based companies while their consumers were treated as imports of insurance by the Kansas user.

The losses paid to Kansas businesses by insurance carriers were treated as a profit, i.e., a liquidation of assets. This was done in order to keep payments for capital (payment for the loss of a capital asset) to be shown in the processing sectors. Similarly, losses to households were treated as a payment to profits. In this case the capital problem is not as relevant as in the prior case since the household sector is not treated as a processing sector.

The Real Estate sector consists of real estate agents and brokers and real estate operators. The output of this group is defined as total annual revenue, and is estimated by average revenue of employees multiplied by the total employment in the group.

Data for this group was gathered by mail questionnaires to the real estate operators and brokers in the state. Questionnaires were mailed to the 100 real estate agencies that belonged to the Kansas Board of Realtors. The response rate for this group in general was low; however, those reporting gave sufficient detail to establish intersector flows and develop the technical coefficients. A double sampling procedure was used in that a small sample

of personal interviews was included to detect bias in the mail survey.

The Savings and Loan Association group consists of all savings and loan associations engaged in business in the state of Kansas in 1965. The output of this group is defined as the earnings from their operation during the base year.

Information for this sector was obtained from the Federal Home Loan Bank of Topeka and supplementary mail questionnaires. The information from the Federal Home Loan Bank was given in broad categories and as totals. To obtain a breakdown of these totals, a brief questionnaire was mailed to all state chartered savings and loan associations; the federally chartered institutions were contacted by personal interview. The resulting information was then used to construct the row and column for Sector 66 of the input-output matrix, with the technical coefficients being derived in the usual manner.

Unpublished data were obtained from the following state and federal agencies:

State Banking Department Federal Home Loan Bank Office of the Commissioner of Insurance Kansas Real Estate Commission

SERVICES

A sample survey provided the data base for constructing the input coefficients for all service sectors. Output coefficients were determined from the service sector survey and surveys of purchases of other sectors.

Service industries are the least clearly identified by published data.

The Bureau of the Census publishes its census reports only for selected services. This necessitated the utilization of numerous sources to estimate total outputs for Medical and Health Services and Other Services in particular.

The following sources were used in deriving output estimates for the service sectors:

Department of Commerce, Bureau of the Census, U. S. Census of Business, 1963: Selected Services-Kansas, (U. S. Government Printing Office, 1966).

Printers'Ink, (New York: Decker Communications, 1966).

Internal Revenue Service, <u>Statistics of Income</u>, <u>1965</u>, <u>Corporation Income Tax Returns</u>.

Department of Health, Education and Welfare, <u>Health Resources Statistics</u> and Vital Health Statistics, 1966.

Department of Labor, Monthly Labor Review, January, 1967.

Department of Health, Education and Welfare, <u>Social Security Bulletin</u>, February, 1967.

American Hospital Association, Hospitals, (Chicago, 1966), Guide Issue.

FINAL DEMAND AND FINAL PAYMENTS

Determination of the input and output coefficients and flows for the Final Demand and Final Payments sectors is simply an extension of the methods for the processing sectors described above.

Total output estimates were obtained from the following:

Department of Commerce, Survey of Current Business, August, 1966.

Office of Economic Opportunity, <u>Summary of Federal Social and Economic Programs</u>, Fiscal Year 1967.

Kansas Department of Administration, <u>Annual Financial Report</u>, Fiscal Year 1966.

Unpublished reports of local units of government submitted to the Post-Audit Division, Kansas Department of Administration.

Department of Commerce, Bureau of the Census, $\underline{\text{Census of Governments}}$. Various reports.

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APPENDIX A

SAMPLE QUESTIONNAIRES



SALES ANALYSIS

1	List	the major products or services you produce:			
2.	Plea	se indicate the 1965 sales of your Kansas estab	olishments. Total Sales: \$	Number of establishme	nts covered by this questionnaire
3.	Allo	cation of Sales among Markets:			
	(a)	In column 1 below, allocate your sales among methe processing or concuming markets to which the sales representing capital goods. Capital goodssets.	they are next resold. In the	parenthesis in column 1 estima	te the percentage of your total
	(b)	In column 2 below, estimate for each market the percentage of your total sales to Kansas users			ate in the parenthesis of the
	(c)	In column 3 below, indicate your dollar sales	by state of destination of sh	ipment for each type of market	•
		MARKETS Brief Description	(1) Sales Distribution	(2) Dollar Sales made in Kansas	(3) State Destination of Out-of-State Sales
		Household Consumers	()	()	
		Kansas Government-State	()	()	
		Kansas Government-Local	()	()	
		Federal Government, Non-Defense		()	
		Federal Government, Defense*	()		
		Foreign Export		()	
		Industrial Markets (briefly identify)	()	()	
			()	()	S
			()	()	
		**************************************	()	()	
			()	()	
			()	()	· Harrison and American American
			()	()	
			()	()	
		TOTAL			

^{*} Sales to the Department of Defense, National Aeronautics & Space Administration, Atomic Energy Commission

PURCHASES ANALYSIS

\$	or	% of your sales dollar						
In column 1 below, p	lease allocate your purchas	es according to supplying i	ndustries a	nd locatio	on of proc	lucers.		
B 1bassa	from wholesalers and retail OU PREFER TO LIST SPECIFIC 1	ers should be shown as purc	hases from :	industries	s producir	ng the pr	oduct. A	list of indus
	SUPPLYING INDUSTRIES	(1) \$ or % of	P	r oportio n		_	ducers in:	
	Brief Description	Sales dollar	Kansas		Other St	ates		Foreign
Purchased Materials:								
								
		_						
								
						_		
	ervices:		EX		44.70 (25.478.0	#W1000FE		
								
	Total Purchases	ė 9						

KANSAS GROSS PRODUCT STUDY

Financial Sector

			In State	Out-of- State	% By State
ı,	Ear	rnings			
	A.	Premium Income			
		1.	Tempo como actoria		Agricultural des
		2.			
		3.			
		4.			
		5.			
	В.	Investment Income			
		1.	-		:
		2.			
		3.			
		4.	***************************************		
		5.		-	
	С.	Other Income			
		1.		***	
		2.		-	P-1007 2 100 10 10 10 10 10 10 10 10 10 10 10 10
		3.		-	-
		4.			
		5.		-	
11.	Exp	enses			
	A.	Claims			
		1.			3—————————————————————————————————————
		2.			
		3.	-		
		4.	***************************************		-
	В.	Salaries (Employees and Officers)	<u> </u>		
	C	Rent			
		1. Rent on land			
		2. Rent on equipment			
		3. Rent on buildings			PA - 15 - 15 - 15 - 15 - 15 - 15 - 15 - 1

			In State	Out-of- State	% By State
			State	State	State
D.	Tax	es			
	1.	Federal			<u> </u>
	2.	State	(
	3.	Local	la de la companya de		
	4.	Other			
		a			
		b			
		c			
E.	Dep	reciation			
F.	Adv	vertising			
	1.	Radio and TV	-		
	2.	Newspapers, journa and billboards	1s		
	3.	Other			
G.	Leg	ga1			
	1.	Court	***		
	2.	Attorney			
н.	Uti	llities			
	1.	Telephone and telegraph			
	2.	Gas			·
	3.	Electricity			
	4.	Water	,		
J.	Su	pplies			
	1.			9	
	2,		:	(
	3.	3-4-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-			
к.		scellaneous Expense identify if possibl			
	1.		-	(
	2	•			
	3	•			
	4				
	5		(SHIP STATE OF THE STATE OF	
	6	• •			
	7	•			

	In State	Out-of- State	% By State
-			
9 944444	**************************************		
9 11111 	-		***************************************

		-	3 1.11.1 .11.11.11.11.11.11.11.11.11.11.11

RECEIPTS - Service Establishments

		% Received from Private Firms		% Received from Government			% Received from Individuals	
Major Sources of Revenue	Dollar Value	In Kansas	Out of State	Federal	State	Local	In Kansas	Out of Stat
The second of th								
	<u> </u>							
			-					
			+					
								-
	 		-					
			-					
						<u> </u>		
						-		
						 		
				-		-		
Total Receipts								

EXPENDITURES - Service Establishments

Makan Phanas	Major Types Dollar		% Paid to: Individuals, Firms, or Governments		% Purchased from Retailers		% Purchased from Others (Specify)	
Major Types of Expenditures	Value	In Kansas	Out of State	In Kansas	Out of State	In Kansas	Out of State	

		-						
The second secon	1.000 - 100							
		157.5		Esser in the second				

Total Expenditures	Š.		Į.	1		}		

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KANSAS GROSS PRODUCT STUDY Office of Economic Analysis

State of Kansas

WHOLESALE TRADE

Directions: Please provide the requested in blank. The information which you supply in this numerous other wholesalers.	questionnaire is considered (CONFIDENTIAL and wil	l be used only for statistical	l purposes in totals with
Average Annual Employment				
Total Annual Wages and Salaries		<u> Pu</u>	rchases from Suppliers Located	l_in:
		Kansas	Other States (Specify)	Foreign
ANNUAL EXPENDITURES FOR POWER AND ENERG	SY			
Coal	**************************************	•		
Gas	Application Contraction Contraction			* <u>*************</u> 5
011			****	
Electricity				
TRANSPORTATION EXPENSES				
Total Annual Transportation Expens	se			·
If you own or operate your own tra please estimate the following expenses				
vehicles.				
Wages and Salaries	NAME OF THE OWNER OF THE OWNER.	 		
Maintenance and Repairs				
Fuel and Oil				
Other				

	<u>P</u>	urchases from Suppliers Located	in:
HER CURRENT EXPENSES	Kansas	Other States (Specify)	— Foreign
Advertising and Sales Promotion			
Newspapers & Printed Material			
Communications	-		
Other (please specify	(-
Rent	(1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2		
Insurance	(Contract of the Contract of t		
Taxes	Alexander of the second second		
Federal			
State	5		
Local		***************************************	
Other			
Telephone and Telegraph			**********
Business and Professional Services (Specify)			
Other Current Expenses			
	·		
	-	****	
		Wanted the second of the secon	

PURCHASES - Wholesale Trade

Product Total Purchased Cost		Transport Costs Paid By You	% Purchased from Wholesalers		% Purchased from Producers		% Purchased from Others (Specify)	
			In Kansas	Out of State (Specify)	In Kansas	Out of State (Specify)	In Kansas	Out of State (Specify)
								ļ
						-		4
						 		
				+	<u> </u>	 		ļ
				-				
						1		
				+				
				<u> </u>				
			<u> </u>	+			1	-
			<u> </u>					
			-			<u> </u>		
			-					
Total Cost of Goods Sold			1					1

SALES - Wholesale Trade

Product Total Sold Cost		Transport	% Sold to Wholesalers		% Sold to Retailers		% Sold to Others (Specify)	
	Costs Paid By You	In Kansas	Out of State	In Kansas	Out of State	In Kansas	Out of State	
	1							
	<u> </u>							ļ
								ļ
	 			-				ļ
				1				
***************************************		fores numerous and the second second		1		 		
		<u> </u>	 					1
TO 100 TO								
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				ļ				
			-	-		ļ		
- VIII- 10	 	 						
*****			-	·				
Total Sales			-		 			

KANSAS GROSS PRODUCT STUDY

Financial Sector

		In State	Out of State	% By State
I, i	Earnings			
I	A. Interest			
	1. Consumer loans			
	2. Industrial loans	3,000		-
	a			
	b			
			-	
	3. Other (Identify			·
	briefly)			
	a			***
	b	: 		-
	c			
	d			9
В	. Income			
	1. Service charge			
	Security trading			/ ***
	 Data processing service 			
	 Other (Identify briefly) 			
	a			
	b			
	c			-
	d.			
II. Ex	penses			****
Α.	Dividends paid			
	1.			
	2.			-
в.	-			
	Salaries (Employees & officers)	~	(
C.	Rent			
	1. Rent on buildings		5 to 10 to 1	
	 Rent on machinery & equipment 			
	3. Rent on land		-	

			In State	Out of State	% By State
D.	Tax	es			
	1.	Federal			
	2.	State		***************************************	
	3.	Local			
	4.	Other (identify)			
		a		****	
		b		-	-
		c		4	
E.	Dep	reciation		-	-
F.	Ins	urance			
	1.	FSLIC insurance		******	
	2.	Other (identify)			
		8.		X de Maria (Albania))
		b,			
		c.			-
G.	Adv	ertising			
	1.	Radio & TV		***************************************	-
	2.	Newspaper & billboard			
	3,	Promotions			·
н.	Sup	plies			
J.	Leg	al			
	1.	Court			
	2.	Attorney		-	
к.	Uti	lities			
	1.	Telephone & telegraph			
	2.	Gas	-		
	3.	Electric			
	4.	Water		-	(** *********************************
L.		cellaneous expense dentify if possible)			
	1,00				
	2.				:
	3.				
	4.			(1 	
	5.	1		(1224)	7

INSTRUCTIONS

This questionnaire is designed to help you provide us with information on your earnings and expenses. All information will be kept strictly confidential. Please do not write your company name on the questionnaire. Individual insurance company characteristics will not be disclosed in the final published tables. The following general instructions are suggested in completing the questionnaire.

- 1. Use your records for 1965, calendar or fiscal, to complete all items in the questionnaire that apply to your company.
- 2. Indicate as best possible, the sources of expenses and earnings. Claims paid to consumers can be shown as a payment to consumers whereas claims paid for hail damage should be shown as a payment to agriculture or farmers. Similarly, payment for fire damage to a firm that manufactures fertilizers should be shown as payment to fertilizer plants.
- 3. If exact information is not available, please estimate.
 Please indicate all entries that are estimated.
- 4. When a miscellaneous category is used, please indicate as best possible what this category includes.
- 5. If you have out of state earnings or expense items, use column three (3) to indicate the state(s) and to estimate what part of the out of state total goes to each state.

	Check	if	you	would	like	a	сору	of	the	final	tables	; .
Average (employm	ent	: 196	65 <u> </u>		_						

KANSAS GROSS PRODUCT STUDY <u>Construction Activities</u>

Information is requested for some of the purchases made by your firm during your most recently completed fiscal year. Percentages, not dollar values, are desired.

	Material Purchases	% of Total Purchases	% Purchased in Kansas
Example:	Portland Cement	10%	5%
	MICHELE 19 F 15 22 75 75	The second secon	.
			
			
	-		
	K-1874-1874-1874-1874-1874-1874-1874-1874		
		(Company of the Park)	(non-interesting to the second
			
		SING OF STREET AND ADDRESS OF STREET	
	Subcontracts	% of Total <u>Purchases</u>	% Purchased in Kansas
Example:	Electrical	5%	3%
	-		
		The second second	
What	percent of your total	al expenditures goes for wages	and salaries?
What	percent of your tota	al expenditures goes for machi	inery and equipment?
What	percent of your work	s is done outside the state of	E Kansas?

Please indicate in the following questions what type of business you receive payments from or make payments to. If fire losses were paid to both consumers and retail grocers, show this as a payment to household consumers and retail grocers; also estimate the per cent of the total payment paid to each, e.g., household consumers 70%, grocers 30%.

Paid to

	Expense Items	(Indicate type	of business a paid to each	
1.	Fire losses	<u>%</u>	%	<u></u> %
2.	Extended coverage	%	%	%
3.	Commercial multiple peril	%	%	%
4.	Inland marine	%	%	%
5.	Liability other than auto		%	%
6.	Auto liability	%	%	%
7.	Glass insurance	%	%	%
8.	Other allied lines	%	%	9/
9.	Rent of equipment	%%	%	°/ /9
10.	Rent	%%	%	%
	Income Items			
1.	Mortgage loans	%	% _	%
2.	Real estate	%		%
3.	Premium income			
	a. Fire	%%%	%%	
	b. Extended coverage	%%	%	%
	c. Commercial multiple peril	%%	%	%
	d. Inland marine	%	%	%
	e. Liability other than auto	%	%	%
	f. Auto liability	%	%	%
	g. Other allied lines	%	%	%

TRUCKING INDUSTRY

Acco	unti	ng Period	to _		Code _		_ Year Began Ope	ration	
			Total Expense	s for Year	r (exclude ca	pital expenditu	res)		
				Tota	l \$ Expense	Kansas	Out of State		
	Ехре	enses	2.						
	Α.	Material purchas	sed						
		1. Gas and oil		:					
		2. Rubber		_				-	
		3.	·····	÷		***************			************
911		4.		1 1 1 1		****			
		5		\$ 		-		***	
		6.		0 0	************	-	Rental Addition of the Land	-	-
		7.		7 				***********	-
	В.	Wages and salari	ies	-					
	C.	Rent		i e		3 0000 00000000000000			
	D.	Interest		2.					2 3/10/21/02/21/21
	E.	Taxes							
		1. Federal		Y 2		: 			
		2. State		-				-	
		3. Local		-					Personal Control of the Control of t

		Total \$ Expense	Kansas	Out of State		
F.	Depreciation			***************************************		
G.	Miscellaneous expenses					
	1. Office supplies					
	2. Insurance					
	3. Maintenance and repairs	-	****	-	******	***************************************
	4. Advertising					
	a. Newspaper and journals	-				
	b. Radio and television	***				****
	c. Billboards					
	5. Utilities					
	a. Gas and electricity					
	b. Telephone and telegraph	************				
	c. Water			-	**	
	6. Travel expenses	And the second second		water the contract of the cont		
	7. Legal and professional					
	8. Claims					
	9	***				
	10.					
	11.					2 1222
	12					

ii.	Ind	come					
	Tot	tal Sales and Receipts					
	Α.	Household consumers	· 		**********************	***	-
	В.	Government-State				-	***********
	c.	Government-Local				toric management	-
	D.	Government-Federal non-defense				Timber to tea - rate	salaine en / manastatura en
	E.	Government-Federal defense	****		-		
	F.	Industrial market (identify)					
		1.			. 		
		2.					**********
		3.					
		4.			(1000) (1000)		*************
		5					was a second was the
		6.	3	****	(/	and the second
		7.			, 	(v ersion and decrease)	
		8.					
		9.			-	/ collection also also also	(in the second
		10.	(*************** *********************		-	-	: Marie Committee State of the Committee
	G.	Miscellaneous receipts					

Out of State

Kansas

Total \$ Income

			Total > Income	Kansas	Out of State		
III.	Cap	ital Expenditures					
	Α.	New construction and additions to plant			Province to the second second		
	В.	New machinery and equipment				-	
	c.	Used and second hand capital goods	-	***************************************	-		
w.	Mis	cellaneous Operating Statistics					
	Α.	Average number employed during per	iod				
	В.	Total after tax profits					
	c.	Profits paid out (dividends, withd	rawals)				
	D.	Type of ownership: Proprietorship	Partners	nip Cor	rp. Coop.		

Information is requested for calendar or fiscal 1965. If it is not possible to provide data for 1965, please use the nearest available year. If other than 1965 data is used, please indicate the period used.

Α.	Ave	rage Annual Employment		
в.	Tot	al Annual Wages and/or Salarie	S	
c.		ual Revenue (excluding persona arnings)	l financial	
			Total Expense	Estimated % of Expense in Kansas
D.	Exp	enses		
	1.	Gas, Electric and Sanitary Service		
	2.	Telephone and Telegraph	****	
	3.	Advertising (indicate type)		
		a. Newspaper		**********
		b. Mail	The second secon	
		c. Radio - TV		
		d. Other		
	4.	Rent		
	5.	Printing	Parameter Company	*******
	6.	Legal		
	7.	Auto Expense		
		a. Gas and Oil		Property and the foundation of the
		b. Repair		*****
	8.	Postage		
	9.	Taxes		
		a. Federal		-
		b. State	(***	-
		c. Local		
	10.	All Other		

Please make estimates to the following questions for the year 1965. If information for 1965 is not available, please use data for the year nearest to 1965 and indicate that you have used other than 1965 data. Please indicate roughly the type of business you receive income from or make payments to.

Operating Income

		Estimated % of Total Income	Estimated % in Kansas
1.	Bank interest	-	
2.	Mortgage loans to:		
	a. Household consumers		
	b. Farm operations		
	c. Business concerns by type of business		
	(1)		(and a significant source of the control
	(2)	Santan de Cara	
3.	Bonds and stocks		
	a. U. S. Government bonds		
	b. State Government obligations		
	c. Local Government	(
	d. Utilities	3	
	e. Industrials (Please list the that are Kansas owned)	ose	

4.	Fees and discounts on loans:		
	a. Household consumers		*************
	b. Others		
	(1)		
	(2)		
5.	Rent and real estate (Please identify source of income by type of business)		

Operating Expense

		% of Total Expenses	% in <u>Kansas</u>
1.	Wages and salaries	same and pale do de	Mariana
2.	Gas, electric & sanitary service		
3.	Telephone & telegraph		
4.	Advertising (indicate type)		
	a. Newspaper		E-commonweal and the second
	b. Radio and TV		
	c. Mail	No. of Contrast of	
	d. Other		
5.	Rent (indicate to what type of business concern paid)		
6.	Printing		
7.	Legal		
8.	Postage		
9.	Depreciation		
10.	Insurance		
11.	License and fees		
12.	Taxes		
	a. Federal		·
	b. State		na contractor
	c. Local		
13.	Dividends paid	Name of the second second	
14.	All other		5.

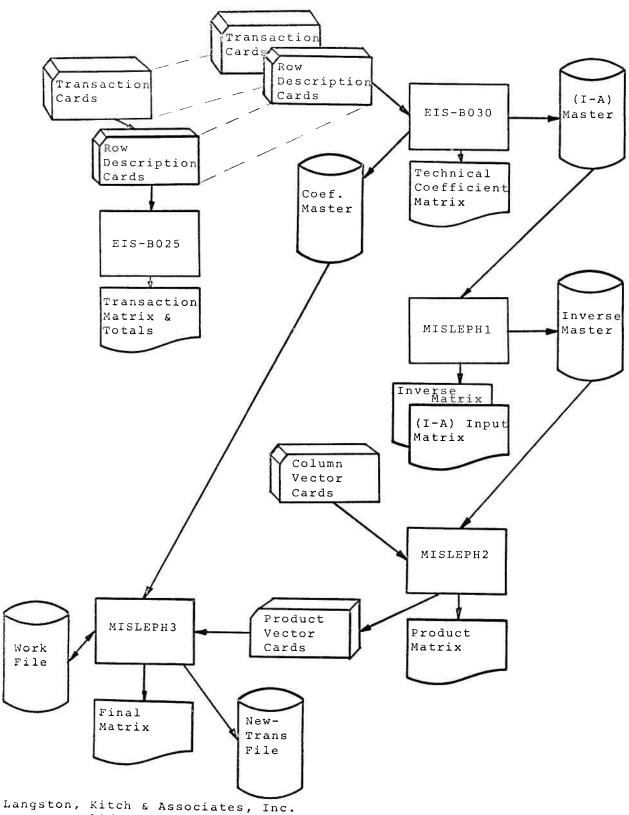


APPENDIX B

COMPUTER PROGRAMS FLOWCHART



MATRIX SYSTEM FLOWCHART



12/06/68

APPENDIX C

INPUT-OUTPUT TABLES

KANSAS INPUT-OUTPUT TRANSACTIONS MATRIX

 Each row in the matrix shows the sales of a Kansas
industry to all other Kansas industries, to Kansas House-
holds, to government, to capital formation, and to exports
(out-of-state sales).

____ Each column shows the purchases of a Kansas industry from each row industry.

FARMING MINING CONSTRUCTION	READ SALES ACROSS
FARMING MINING CONSTRUCTION	TRANSPORTATIONUTILITIES WHOLESALE RETAIL F. I. R. E. SERVICES FINAL DEMAND
INTERINDUSTRY FLOW OF GOODS AND SERVICES Souther Agricultural Services Cattle Conner Genins Conner Genins	Principal Products Adding Services and Services and Services Adding Services and Se
Corn 1 2,061 0 0 0 0 6,673 166 19,178 20,144 0 0 0 0 0 0 0 0 0 0 0 0 0 1,547 0 Sorghum 2 0 2,040 0 0 0 0 8,695 286 76,711 9,213 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Wheat 3 0 0 19,823 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Oil & Gas Field Services 14 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Nonmetallic Mining 15 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Heavy Construction 19 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Meat Products 21 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Industrial Chemicals 28 1,781 3,196 5,231 427 0 0 0 730 8,163 727 0 9,656 936 70 0 0 0 113 0 0 16 5 350	0 253 0 5,608 9 793 0 233 0 91 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Agricultural Chemicals 29 388 585 951 91 122 225 7 0 55 0 18 35 132 14 0 0 0 0 0 113 0 0 0 723 0 Other Chemicals 30 0 0 0 0 0 0 0 0 0 0 0 373 2,080 219 1,277 147 0 1,064 638 6,166 0 0 417 676	0 0 0 132 193 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Petroleum & Coal Products 31 1,554 5,136 5,451 470 1,790 2,269 0 249 0 505 74 663 1,248 131 1,4 3 505 0 1,505 7,133 890 64 353 75 241	0 0 44 2,425 553 135 4,221 149 341 8 0 14 253 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Rubber & Plastics 32 0 0 0 0 0 0 0 0 0 0 0 0 13 0 Cement & Concrete 33 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Other Stone & Clay 34 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Primary Metals 35 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Other Fabricated Metal Products 37 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	18 58 0 0 0 0 1,446 39 5 777 21 0 152 12 999 354 47 68 20 737 1,803 0 550 0 0 16 0 0 0 58 0 950 9 -302 2,147 5 0 0 0 49,710 52 519 75 0
Farm Machinery 38 862 2,246 3,199 272 897 1,113 287 96 920 213 62 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Food Products Machinery 40 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 267 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Electrical Machinery 41 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	* 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Motor Vehicles 43 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Aerospace 44 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Other Transportation Equipment 46 0 0 0 0 0 0 0 0 0 0 0 0 77 8 2 3 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Other Manufacturing 47 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	82 4 5 0 0 0 0 12 5 37 5 3 45 43 19 0 0 0 0 12 5 37 5 3 45 43 19 0 0 0 0 1,070 273 3,458 6,642 2,700 206 1,039 145 189 4 29,404 40,327 59,440 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Motor Freight 49 392 1,075 1,405 102 140 741 0 92 769 170 2 315 1,802 1,102 4,4 90 0 1,733 997 0 3,814 165 1,532 1,022 Other Transportation 50 * 2 2 * 1 2 1 * 4 * * * * 545 57 2 * 0 0 0 41 1430 0 2 0 1	41 2,167 898 1,923 232 2,751 7,543 80 1,194 1,136 233 587 958 41 31 77 28 130 49 96 118 30 288 1,789 501 95 1,445 1,721 205 1,240 2,594 448 1,114 1,566 7 4,028 149 162 22 17 204 98 390 119 171 6,319 0 0 4,105 1,026 2,931 1,489 64,930 80,802 137,445
Gommunications 51 40 89 146 11 20 83 35 27 176 71 130 356 118 12 15 32 0 1,286 278 457 351 287 309 1,253	4 12 7 4 1 8 9,095 0 0 3 6 1 1 3 2 5 4 1 0 149 0 0 10 117 367 2,246 8 6 1 4 4 3 0 4 1 8 3 3 9 160 180 71 1 0 2 15,532 0 0 2,164 382 261 97 3,665 22,101 36,702 186 266 1,622 2,275 477 798 486 866 260 285 76 199 935 286 185 369 463 688 1,795 2,623 380 0 340 1,456 1,020 410 9,735 1,098 903 3,913 4,177 2,246 123 1,023 1,443 1,700 4,652 10,605 6,069 897 1,614 5,058 1,116 402 12,827 45,942 0 0 2,079 1,386 2,804 1,047 13,149 66,407 160,452
Electric Gas & Sanitary Services 52 733 1,244 3,213 219 462 1,719 1,011 205 1,495 264 93 678 928 396 2,477 1,034 0 1,845 410 591 952 889 1,031 1,782 Groceries 53 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 786 466 730 109 2,580 9,880 1,874 96 974 141 217 2,037 303 99 111 78 1,083 2,294 3,582 113 0 295 1,192 530 545 1,999 54,781 1,314 1,720 1,116 1,188 398 1,548 4,982 5,446 2,185 1,417 1,997 2,303 3,505 299 2,337 631 17,837 112,007 0 0 0 2,754 1,994 4,500 1,054 V 1,804 124,113 284,97
Farm Products 54 295 0 1,329 19 121 646 249 48 4,854 224 69 738 0 0 0 0 0 0 0 0 4,761 0 17,173 1,435	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Machinery & Equipment 55 77 126 203 24 44 116 8 2 141 10 6 368 3,300 1,800 1,5 0 1,000 0 1,000 1,500 1,000 3,800 900 2,276 1,600 Other Wholesale Trade 56 2,055 3,952 6,230 124 717 3,156 1,734 335 16,138 1,088 483 1,405 1,616 382 611 545 0 2,269 2,894 3,161 5,753 244 4,300 2,661	200 600 600 900 100 2,200 4,500 1,600 500 100 400 256 300 300 100 100 900 100 7,900 300 100 100 900 100 7,900 300 100 100 900 100 7,900 300 100 500 166 650 17 167 190 190 785 325 342 4,150 323 2,618 4,607 700 250 198 956 950 727 2,000 409 2,900 500 0 1,780 650 650 2,100 3,264 6,144 15,088 82,567 100 100 100 100 100 100 100 100 100 10
Farm Equipment Dealers 57 2,115 6,132 9,073 159 2,176 2,106 619 128 2,627 829 225 832 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Eating & Drinking 59 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5 0 42 0 0 84 237 15 286 204 9 40 8 22 208 0 0 28 0 4 0 0 28 1,301 0 0 1,772 82 2,898 248 226 51 0 49,769 0 0 0 121 1,551 5,427 56,869 74,312 0 70 25 0 0 0 0 84 0 0 0 156 0 0 0 0 156 0 0 0 0 156 0 0 0 0 156 0 0 0 156 0 0 0 156 0 0 0 156 0 0 0 156 0 0 0 156 0 0 0 0 156 0 0 0 0 156 0 0 0 0 156 0 0 0 0 156 0 0 0 0 156 0 0 0 0 0 156 0 0 0 0 0 156 0 0 0 0 0 0 156 0 0 0 0 0 0 156 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Other Retail Trade 60 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 31 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
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Insurance & Real Estate 63 1,764 3,393 5,930 111 723 0 54 0 290 0 0 0 61,048 6,418 2,019 1,085 0 717 518 1,718 3,764 172 609 535 Lodging Services 64 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	40 286 125 274 4 450 162 431 157 700 82 170 28 88 129 101 88 415 1,101 * 1,653 0 95 94 3,062 116 1,768 502 170 342 303 425 611 599 359 8,427 1,140 3,018 5,273 989 5,236 738 2,004 5,908 2,277 143,330 0 0 0 3,370 807 12,389 94,191 254,087 394,892 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Personal Services 65 163 313 547 10 67 250 137 27 1,277 86 38 108 638 67 40 23 0 422 1,800 0 18 53 98 180 Business Services 66 128 247 431 8 53 197 108 43 1 007 108 43 1 007 108 43 1 007 108 43 1 007 108 108 108 108 108 108 108 108 108 108	0 0 117 0 0 0 35 64 0 3 3 21 1 61 0 2 10 0 0 6 0 0 7,491 1,531 2,089 111 0 430 2,444 1,156 138 7,491 0 5,126 181,762 0 0 0 0 159 77 14,228 196,225 238,917
Business Services 66 128 247 431 8 53 197 108 42 1,007 166 30 177 1,735 643 0 229 0 441 2,363 58 367 294 300 539 Medical & Health Services 67 0 0 0 0 0 0 0 0 0 0 334 44 0 33 0 940 0 957 0 0 0 0	2 218 93 0 69 76 176 4 54 61 103 69 113 112 0 0 0 2 111 0 721 75 0 192 117 0 52 2,985 3,225 345 897 419 418 0 34 2,209 223 1,212 1,567 1,404 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Other Services 68 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	12 61 458 0 0 183 513 169 219 234 17 56 54 56 265 30 44 162 0 733 0 0 75 102 740 722 1,841 366 270 1,562 2,009 1,246 802 4,820 371 2,174 3,120 4,619 5,410 651 1,512 336 1,794 1,605 2,967 15,761 0 0 0 111 2,241 2,876 6,415 27,404 80,722
Households 70 39,916 79,963 137,312 4,311 20,906 77,017 14,947 9,578 85,305 21,706 0,002 18,808 30,911 23,334 0,516 0 57,334 45,764 87,304 60,382 14,609 21,979 29,114 14	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
Gross Savings 71 11,552 28,056 34,421 778 3,613 12,094 5,906 2,563 26,966 3,201 2,544 5,293 185,742 1,747 24,1 0 16,132 0 6,855 6,981 11,612 2,934 2,513 1,583 4,138 1 Federal Government 72 0 0 0 0 0 0 0 0 0 0 0 1,527 214 5 48 0 16,726 3,222 17,361 1,145 720 23,369 3,066 1	4,336 6,030 19,059 313 8,861 36,373 6,953 9,519 4,132 1,031 2,942 3,416 2,869 788 1,737 1,778 6,305 10,345 13,131 8,066 6,455 3,301 5,169 2,208 39,879 10,448 10,937 12,600 2,943 16,010 3,147 36,992 5,385 1,477 201,727 0 -13,499 -169,648 -287,868 0 2,210 42,197 717,148 654,520
State Government 73 422 720 2,827 44 119 495 710 67 217 92 91 412 900 59 21 5 0 4,516 2,138 1,644 777 631 2,136 862 Local Government 74 2,028 3,029 6,285 210 573 2,380 20 121 5,312 200 767 123 716 67	1,321 268 5,826 3,491 711 3,674 893 1,212 4,865 1,536 793 1,796 397 2,677 764 837 234 4,743 29,558 26,623 128 1,716 638 14,067 12,516 940 866 6,280 1,735 5,180 3,913 3,976 2,104 965 9,773 16,095 34,734 24,095 10,471 316 5,864 1,124 14,193 1,730 722 745,739 0 0 0 86,167 9,012 2,832 0 843,750 1,77564 175 180 1,77564 175 180 1,77564 175 180 1,77564 175 180 1,786 180
Imports 75 17,239 25,365 54,305 1,098 6,089 9,576 5,611 2,561 81,088 10,509 2,433 14,893 58,977 3,048 10,511 3,884 0 72,210 19,969 161,804 53,141 22,034 100,153 104,139 19	37 286 440 1,479 95 1,317 804 445 578 268 86 189 325 154 177 286 90 311 822 1,154 115 50 134 2,779 318 218 176 15,001 126 469 358 430 457 565 893 3,439 267 4,335 1,556 1,278 1,716 165 611 2,352 143 315,434 0 0 0 13,641 111,984 60,855 0 501,914 580,109 29,440 39,485 54,908 74,482 10,321 134,776 165,492 103,451 19,331 44,592 17,758 38,260 41,690 23,683 23,669 13,067 25,739 61,547 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,342 3,863 6,757 7,618 7,358 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,342 3,863 6,757 7,618 7,358 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,342 3,863 6,757 7,618 7,358 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,342 3,863 6,757 7,618 7,358 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,342 3,863 6,757 7,618 7,358 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,342 3,863 6,757 7,618 7,358 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,342 3,863 6,757 7,618 7,758 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,342 3,863 6,757 7,618 7,758 38,260 41,690 23,683 23,691 13,042 3,863 6,757 7,618 7,758 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,342 3,863 6,757 7,618 7,758 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,342 3,863 6,757 7,618 7,758 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,042 3,863 6,757 7,618 7,758 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,042 3,863 6,757 7,618 7,758 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,042 3,863 6,757 7,618 7,758 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,042 3,863 6,757 7,618 7,758 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,042 3,863 6,757 7,618 7,758 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,042 3,863 6,757 7,618 7,758 14,075 109,058 223,954 24,541 38,096 31,640 59,244 56,591 13,042 3,863 6,757 7,618 7,758 14,075 109,058 223,954 24,541 38,096 31,090 23,090 23,090 23,090 23,090 23,090 23,090 23,090 23,090
Total Purchases 76 88,883 178,610 321,584 9,493 41,952 122,590 72,316 22,791 596,977 100,852 19,947 58,324 441,761 46,443 73,122 46,902 166,039 367,289 125,000 344,804 590,639 112,711 333,728 207,100 38	3,666 75,582 119,080 153,654 16,665 229,897 580,338 151,718 76,168 96,544 31,405 58,993 580,338 151,718 76,168 96,544 31,405 58,993 580,109 4915,359 13,887,545 25,363 54,907 558,993 580,109 4,915,359 13,887,545 25,363 54,907 558,993 580,109 4,915,359 13,887,545 25,363 54,907 558,993 580,109 4,915,359 13,887,545 25,363 54,907 558,993 580,109 4,915,359 13,887,545 25,363 54,907 558,993 580,109 4,915,359 13,887,545 25,363 54,907 558,993 580,109 4,915,359 13,887,545 25,363 54,907 558,993 580,109 4,915,359 13,887,545 25,363 54,907 558,993 580,109 4,915,359 13,887,545 25,360,552 13,887,545 25,363 54,907 558,993 580,109 4,915,359 13,887,545 25,360,552 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,545 25,360,562 13,887,5
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KANSAS DIRECT REQUIREMENTS MATRIX

Each column shows the dollar fraction purchases from row industries necessary for the column industry to produce \$1 of output.

KANSAS DIRECT REQUIREMENTS MATRIX

FARMING	MINING CONSTRUCTION		MANUFACTURING	TRANSPORTATION UTILITIES		
9		To the state of th	garts	TRANSPORTATION UTILITIES	WHOLESALE RETAIL	F. I. R. E. SERVICES
DIRECT PURCHASES	tural Gas a Services Repair Repair	ucts Incts Incts Incts Incts Includets Incolucts Incoluc	lay te Metal Pro chinery achinery inery	ation Equiportation	Ipment Trade Trade Stations	Estate Services
R DOLLAR OF OUTPUT KANSAS, 1965 RANSAS, 19	& Gas Field (A) in Mining (A)	Products Products Treat Tre	ary Metals ary Metals leated Meta leated Meta ruction Ma	r Manufactures Freight Transport	Products Froducts Wholesale Equipment I Equipment I Service	Rinance Services Services Services Services
The solution of the solution o	Nonn Nonn Heav	Spec Grain Dair Meat Appa Appa Agrin Indu	Const Fabr Const Note	Aeros Othes Oches	Farm Farm Other Other Other	Banki Insurr Lodgir Persor Persor
1 .023,185 .092,272 .007,294 .032,125 .199,740	13 14 15 16 17 18 19	20 21 22 23 24 25 26 27 28 29 30 31 32 .004,635	33 34 35 36 37 38 39 40 41 42 43	44 45 46 47 48 49 50 51 5	53 54 55 56 57 58 V 59 60 V V V V V V V I	61 62 63 64 65 66 67 68
2 .011,420 .120,241 .012,530 .128,498 .091,348 3 .061,641 s 4 .048,704		.030,177			· · · · · · · · · · · · · · · · · · ·	
5 .044,944 .044,623 .171,175 .043,991 cts 7		.155,050 .000,072 .001,426 .000,109 .540,973 .005,063				
9 .044,623 .202,137		.014,392 .000,320 .534,151			. 9 .001,853	
ultural Products 11 .022,859 .019,086 .067,557 1 Services 12 .021,581 .048,415 .059,752 .064,203 .014,515 .033,280 .057,183 .015,410 .012,936 .056,738 .013,167 .014,	6	.139,070		00,004 .025,645	· \V .003,707	.000,350
Natural Gas 13 ield Services 14 Mining 15	.034,650 .034,660 .078,590 .000,246 .0004,890 .000,405 .001,399 .042,800	.002,021 .047,151 .495,167	003,954 002,762 005,341 .003,448 .00	00,001	· 14 ·	
g 16	.000,0 4 .000,014 .064,920 .226,024 11 .000,4 9 .000,409 .000,980 .000,959 .000,100 .000,200 .000	00,096 .000,667 .006,187 .001,686 .003,863 .008,616 .023,034 .006,677 .001,138 .000,591 .000,4	003,313 44 .019,387 .012,598 .005,081 .002,385 .004,472 .002,856 .009,072 .010,643 .029,412 .012,447 .002,946 .0	.000,290 .016,426 .001,830 .029,262 .034,006 .028,176 .020	0,410 .020,110 .008,3558 .004,433 · .002,875 .004,	.000,319 .000,080 .000,230 / .000,230 / .000,314 .003,416 .000,144 .008,513 .004,965 .018,939 .02
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cts 22 Products 23 .112,276 .203,379 .047,100 .200,653 .033,461		.043,979 .000,431 .015,720 .021,917 .027,331 .004,095 .050,868 .031,029		, .000,023		.014,349 .004,825 .018,530 .007,182 .006,930 .002,406 .000,655
& Kindred Products 24 .080,204 .008,416 .003,710 .011,375	.006,522 .000,115 .00 38 .000,2 6 .000,276 .005,268 .002,436 .000,113	.000,114 .003,210 .048,420 .002,006 .002,006 .001,123 .002,006 .002,380 .006,073 .021,939 .008,925 .000,988 .000,647 .029,148 .014,276 .024,504 .000,639 .000 2	.000,001	.005,000 .001,069 .001,069 .000,762 .000,744 .011	05,398	.013,172
Publishing 27 Chemicals 28 .020,034 .017,895 .016,265 .045,021 .032,032 .013,674 .007,210 .165, 1 Chemicals 29 .004,361 .003,275 .002,958 .009,561 .002,915 .001,835 .000,092 .000,093 .000,924 .000,	.000,0 6 .000,046 .000,133 .000,186 .000,999 .000,200 .000 2 .002,1 0 .001,511 .000,900	0,461 .000,273 .001,465 .000,928 .001,548 .019,266 .000,523 .000,577 .000,145 .000,015 .001,688 .003,349 .036,495 .000,553 .003,451 .001,5	.001,532 .001,213 .003,739 .000,247 .001,003 .001,095 .000,939 .000,088 .027,539 .000,482 .000,482	02,608000,247 .008,245 .001,267 .000,350 .011,964 .000,616 .003	3,206 .020,134 .009,282 .003,144 .023,808 .002,390 .000,600 .023,7	.000,322 .006,231 .000,267 .00099 .016,949 .015,332 .014,310 .000,408 .001,356 .029,692 .000,267 .000,130 .001,920
cals 30 .000,971 .006, Coal Products 31 .017,481 .028,755 .016,951 .049,468 .042,658 .018,506 .010,940 .005,011 .003,691 .011,	2 .004,7 8 .004,708 .016,499 .003,138 .002,898 .005,100 .017 /5 .002,8 4 .002,824 .020,280 .010,758 .004,097 .057,060 .006	7,884 .001,250 .003,263 .009,118 .000,719 .000,859 .011,631 .002,2 22,581 .000,109 .003,131 .000,223 .001,164 .000,368 .015,779 .033,308 .000,588 .007,273 .000,9		00,012	.001,127 .000,079 0,103 2 .000,106 25,363 .014,217 .017,808 .009,495 .002,801 .021,780 .002,	
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als 35	.000,3 3 .000,524 .003,063 .002,656 .002,055 .004,832 .007 .000,2 2 .016,762 .007,700 .02 51 .005,07 .004,742 .000,602 .004,897 .009,452 .000,703 .01	77,382 33,146 	.030,023 .002,072 .000,984 .024,873 .004,932 .002,431002,274 .020,587001,685 .009,572 .000,902	01,093 .011,762 .005,851 .003,578 .001,583 .000,921 .003,231 .044,247 .003,684 .003,684 .003,684 .003,578 .000,239 .003,557 .000	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	
18	.000,008	.002,492 .000,2	.000,024 .000,226 .020,891 .013,220 .001,04 .000,330 .000,099	.001,934 .000,414 .000,006 .000,019 .000,468 .	7	.000,336 .024,434
ts Machinery 40 Machinery 41 nery 42	.003,63 .003,603 .004,77 .004,757 .011,462 .004,246 .000,300 .001,200 .000 .001,5 0 .001,510 .000,914 .002,890 .000,100 .000	.000,018 .002,242	.000,002 .000,952 .004,256 .000,057 .002,715 .002,837 .031,910 .082,521 .000,454 .000,115	00,000		
1es 43 44 44 45 45 45 45 45 45 45 45 45 45 45	.000,618	.000,0	001,528 .005,177	00,001 .012,940 .000,040		.010,115
Portation Equipment 46 acturing 47 and acturing 48 .000,081 .000,093 .000,093 .000,095 .000,093 .000,114 .000,093 .000,093 .000,079 .000,032 .000,064 .000,093 .000,0	.000,15 .000,175 .000,159 .000,063	08,328 .000,109 .000,005 .002,148 .000,055 .000,042 .000,05 00,168 .003,386 .000,047 .004,091 .007,454 .002,695 .000,378 .007,020 .007,831 .007,482 .000,174	77 .000,068 .000,380 .000,149 .000,038 .000,593 .000,830 .000,400	006,950000,588 .000,061	9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	19 19 5 44 .010,900 .000,771 .002,028 17 9 5 .003,555 .0
the 49 .004,407 .006,018 .004,369 .010,770 .003,340 .005,049 .004,030 .001,288 .001,690 .000,081 .005,049 Sportation 50 .000,005 .000,010 .000,007 .000,021 .000,013 .000,013 .000,010 .000,010 .000,008 .000,003 .000,018 .000,010	192 .004, (19 .023,730 .006,346 .001,912 .004,718 .007,979 .008 .001,2 3 .001,2 3 .000,029 .000,010 .000,327 .004	.006,458 .001,464 .004,591 .004,937 .001,073 .028,668 .007,545 .012,517 .013,967 .011,966 .012,997 .000,555 .000,015 .000,004 .000,104 .000,165 .000,055 .000,024 .000,060 .000,036 .015,672	.000,163 .013,020 .026,721 .001,422 .005,879 .014,047 .014,371 .015,189 .019,246 .006,403 .004,090 .017 .015,676 .011,765 .007,414 .008,401 .012,764 .000,803 .000,649 .002,872 .000,635 .001,021 .000,220 .017 .000,026 .000,179 .000,011 .000,009 .000,059 .000,044 .000,175 .000,097 .000,008 .000 .000	000,171 .002,792 .000,677 .004,838 .007,160 .003,648 .002,581 .009,004 .006 040 .004	23,213 .008,561 .016,797 .005,270 .034,046 .000,750	.000 .000,922 .000,923 .000,922 .000,621 . .000 .000,895 .000,513 .000,055 .000,482 .000,855 .002,234 .001,295 . .20 .000,018 .000,010 .000,023 .004,671 .000,752 .001,620 .000,003
tons 51 .000,449 .000,498 .000,453 .001,191 .000,487 .000,680 .000,487 .001,163 .000,295 .000,703 .006,511 .006, as & Sanitary Services 52 .008,252 .006,964 .009,990 .023,116 .011,010 .014,025 .013,980 .009,010 .002,505 .002,617 .004,666 .011, 53	.76 .000, 7 .000,267 .001,845 .000,674 .003,502 .002,221 .001 .25 .002,11 .008,520 .033,460 .022,048 .005,024 .003,280 .001	01,715	07, 603,415 .002,949 .002,428 .002,848 .012,459 .005,534 .003,857 .013,790 .010,671 .005,406 .008,042 . 08, 001,261 .010,084 .004,491 .003,097 .027,135 .005,861 .002,069 .004,152 .001,791 .008,512 .010,274 .		19,812 .048,123 .050,586 .017,724 .004,063 .013,773 .008,296 .004,03 28,827 .021,158 .013,511 .009,376 .013,104 .020,830 .028,650 .012,98 01,152 .031,630 .000,469 .000,438 .002,397 .032,602 .022,48	553 .027,915 .033,566 .015,368 .026,140 .006,755 .115,711 .003,707 . 81 .013,109 .004,484 .005,057 .067,156 .014,672 .006,848 .007,762 . 81 .004,107 .027,918 .003,790
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nent Dealers 57 .023,797 .034,330 .028,213 .016,756 .051,869 .017,178 .008,558 .005,606 .004,401 .008,224 .011,263 .014,	.000,6 ¹ 2 .000,972 .002,858 .002,302 .000,641 .001,977 .003	03,559 .000,538 .000,141 .000,352 .000,366 .000,408 .000,0	99 .003,755 .002,118 .000,284 .000,570 .000,101 .000,433 .004,355 .000,222 .0	00,008 .002,346 .003,654 .001,710 .000	06,341 .003,554 .004,452 .002,374 .003,101 .000,160 .003,10	00 .004,488 .002,386 .012,129 .005,672 .000,750 .
11 Trade 60 60 61 .005,602 .002,914 .002,574 .002,523 .005,173 .004,555 .002,109 .001,740 .001,505 .002	.002,274 .002,274 .006,688 .005,386 .001,318 .003,405 .000 .005,437 .005,487 .016,135 .012,993 .000,763 .005,053 .000 .001,874 .002,488 .003	00,443	.001,107 .000,931 .000,072	.000,168 .000,803 .000,120 .001,043 .000,772 .003 .000,001 .000,338 .000,570 .002,435 .000,727 .003 .01,464 .001,768 .001,973 .000,806 .007,442 .011,690 .004,880 .000,282 .003	03,408 .004,891 .027,935 .005,504 .000,700 .000,70 09,068 1.004,237 .002,901 .001,060 .006,100 .002,90 05,454 .013,334 .015,205 .008,654 .006,149 .002,968 .000,664 .006,149	00 .002,127 .002,537 .003,179 .001,324 .000,397 .001,757 .000,150 00 .002,256 .000,914 .001,150 .001,500 .004,310 .0 47 .008,836 .041,468 .002,301 .010,414 .001,506 .008,480 .004,338 .0
Ace 62 .000,622 .000,328 .000,286 .000,280 .000,575 .000,506 .000,234 .000,193 .000,167 .000 Real Estate 63 .019,846 .018,997 .018,441 .011,699 .017,235 .000,743 .000,485 Evices 64	.000,107 .001,781 .001 .138, 92 .138,199 .027,606 .023,124 .001,952 .004,143 .004 .002,48 .002,448 .001,600 .001,298 .000,278 .003,600 .000	01,074	.000,077002,057 .007,246 .002,626 .002,429 .000,371 .001,706 .002,693 .003,774 .002,030 .003,259 .004,931 .000,724 .005,441 .000,137 .000,639 .000,381 .000,163	00,057 .001,502 .002,200 .006,053 .006 00,000 .039,073 .001,601 .000,375 .022,279 .003,170 .011,022 .001,763 .002 00,396 .000,200 .000,214 .000,120 .002	08,657 .002,308 .001,030 .002,30 03,725 .004,210 .003,666 .003,350 .020,094 .008,057 .002,063 .020,08 03,040 .004,594 .024,997 .005,001 .001,265 .000,71	00 .008,171 .022,284 .002,820 . 87 .006,839 .009,554 .013,353 .028,832 .021,914 .016,888 .006,657 . 15 .003,190 .004,661 .006,702 .000,808 .000,255 .001,675 .000,930
rvices 65 .001,830 .001,751 .001,700 .001,078 .001,589 .002,038 .001,898 .001,165 .002,139 .000,854 .001,918 .001 rvices 66 .001,442 .001,380 .001,340 .000,850 .001,252 .001,606 .001,496 .001,853 .001,686 .001,650 .001,511 .003 realth Services 67	.001,443 .001,443 .000,544 .000,490 .001,149 .014,400 .0141 .003,928 .013,850 .004,884 .001,201 .018,900 .000 .000,757 .000,938 .000,820 .000,701 .002,558 .002	.000,030 .000,471 .000,294 .000,868 .000,982 .000,622 .002,610 .000,899 .002,603 .000,061 .002,887 .000,781 .004,165 .000,331 .000,304 .000,000,000,000,000,000,000,000,000,00	29 .000,839 .000,098 .000,047 .000,279 .000,019 .001,275 .000,039 .000,078 29 .000,713 .000,631 .003,268 .000,989 .001,510 .002,165 .000,035 .000,873 20 .000,154 .000,026	00,418 .000,098 .025,696 .021 01,285 .001,780 .003,228 .000,469 .001,409 .018,606 .011,316 .000	21,797 .015,548 .008,276 .005,568 .100,805 .008,803 .004,97 07,574 .011,028 .005,069 .003,301 .000,464 .001,610 .005,31	79 .000,664 .001,089 .071,243 .004,837 .003,164 .024,880 .11 .011,640 .007,009 .016,296 .001,818 .050,529 .000,742 .0
ces 68 69 70 .449,084 .447,696 .426,986 .454,131 .498,330 .628,249 .206,696 .420,249 .142,896 .215,227 .303,900 .323	.002, 96 .004,190 .003,775 .002,240 .010,129 .017,404 .004	14,572 .001,324 .000,951 .000,377 .003,536 .000,313 .000,808 .003,850 .000,796 .000,884 .001,1	.002,871 .002,427 .000,547 .000,807 .000,714 .001,080 .005,537 .001,110 .001,008 .001,274 .000,058	01,306 .001,256 .000,407 .005,383 .019,658 .011,472 .003,286 .009,051 .000,001	.000,303 .011,317 .006,393 05,925 .019,206 .024,326 .009,830 .026,409 .064,858 .002,134 .005,18 .000,075 .024,719 .011,28	92 .004,679 .023,280 81 .018,719 .014,621 .013,700 .018,981 .006,331 .007,683 .005,959 .0 89 .003,910 .000,790
rernment 72 .129,966 .157,081 .107,036 .081,962 .086,120 .098,654 .081,668 .112,460 .045,170 .031,736 .127,555 .090	.083, 54 .545,927 .095,075 .098,409 .156,101 .366,110 .253 .761 .420,457 .037,616 .330,365 .343,948 .018,664 .055,845 .033 .003,457 .004,605 .000,755 .001,026 .045,540 .025,780 .050	33,676 .004,968 .022,297 .004,744 .019,983 .033,219 .057,364 .050,642 .124,037 .018,852 .038,542 .062,675 .045,8 50,349 .001,938 .006,392 .070,024 .014,804 .034,712 .003,547 .048,924 .022,720 .042,811 .015,980 .001,539 .007,98	.274,437 .379,504 .279,486 .303,881 .277,169 .260,522 .295,346 .309,706 .254,011 .343,494 .240,874 . .124,974 .042,795 .032,825 .042,074 .045,517 .055,575 .016,482 .064,882 .040,993 .049,557 .046,204 6 .063,873 .015,909 .025,240 .025,682 .005,295 .051,855 .015,972 .031,278 .005,385 .037,278 .132,403	44,882 .184,916 .070,935 .298,009 .440,153 .235,316 .257,388 .313,602 .328,641 .527 29,090 .014,284 .016,421 .025,680 .112,879 .082,938 .123,597 .365,098 .170,112 .033 47,444 .003,023 .038,695 .010,736 .056,291 .091,060 .025,621 .005,396 .027,037 .038	27,934 .299,630 .385,706 .720,770 .459,296 .477,557 .408,503 .467,60 32,096 .161,503 .097,696 .050,936 .108,650 .069,564 .012,699 .095,03 38,075 .063,715 .047,390 .031,374 .069,251 .012,986 .056,201 .038,36	09 .525,155 .590,915 .441,578 .316,752 .626,176 .290,578 .532,302 .4 57 .062,690 .034,617 .031,907 .085,794 .067,012 .072,000 .122,861 .0 65 .208,420 .076,264 .026,517 .009,223 .024,544 .025,707 .047,139 .0
Timent 73 .004,744 .004,031 .008,790 .004,596 .002,841 .004,036 .009,825 .002,940 .000,363 .000,916 .004,542 .007 Timent 74 .022,814 .016,957 .019,545 .022,102 .013,662 .019,412 .000,279 .005,330 .008,899 .002,874 .038,445 .002 T5 .193,951 .142,011 .168,866 .115,661 .145,146 .078,118 .077,586 .112,360 .135,830 .104,203 .121,948 .255	5 .002,038 .001,281 .000,294 .000,104 .012,296 .017,100 .007 17 .001,15 .001,006 .000,233 .000,082 .005,858 .012,080 .01 156 .133,04 .065,630 .144,003 .082,812 .196,603 .159,754 .4	04,769 .001,315 .005,594 .006,400 .004,161 .007,317 .005,407 .007,308 .004,204 .006,028 .001,182 .000,421 .002,20 10,772 .000,521 .002,337 .001,539 .002,504 .000,963 .003,785 .003,696 .009,628 .005,744 .005,730 .001,385 .002,90 10,772 .000,521 .002,337 .001,539 .002,504 .000,963 .003,785 .003,696 .009,628 .005,744 .005,730 .001,385 .002,90 10,772 .000,521 .002,337 .001,539 .002,504 .000,963 .003,785 .003,696 .009,628 .005,744 .005,730 .001,385 .002,90 10,772 .000,521 .002,337 .001,539 .002,504 .000,963 .003,785 .003,696 .009,628 .005,744 .005,730 .001,385 .002,90 10,772 .000,521 .002,337 .001,539 .002,504 .000,963 .003,785 .003,696 .009,628 .005,744 .005,730 .001,385 .002,90 10,772 .000,521 .002,337 .001,539 .002,504 .000,963 .003,785 .003,696 .009,628 .005,744 .005,730 .001,385 .002,90 10,772 .000,521 .002,337 .001,539 .002,504 .000,963 .003,785 .003,696 .009,628 .005,744 .005,730 .001,385 .002,90 10,772 .000,521 .002,337 .001,539 .002,504 .000,963 .003,785 .003,696 .009,628 .005,744 .005,730 .001,385 .002,90 10,772 .000,521 .002,337 .001,539 .002,504 .000,963 .003,785 .003,696 .009,628 .005,744 .005,730 .001,385 .002,90 10,772 .000,521 .002,337 .001,539 .002,504 .000,963 .003,785 .003,696 .009,628 .005,744 .005,730 .001,385 .002,90 10,772 .000,521 .002,337 .001,539 .002,504 .000,963 .003,785 .003,696 .009,628 .005,744 .005,730 .001,385 .002,90 10,772 .000,521 .002,337 .001,539 .002,504 .000,963 .003,785 .003,696 .009,628 .005,744 .005,730 .001,385 .002,90 10,772 .000,521 .002,337 .001,539 .002,504 .000,963 .003,785 .003,696 .009,628 .005,744 .005,730 .001,385 .002,90 10,772 .000,521 .002,337 .001,539 .002,504 .000,963 .003,785 .003,696 .009,628 .005,744 .005,730 .005,7	.007,843 .002,590 .003,420 .007,345 .007,974 .004,371 .003,925 .003,268 .011,731 .021,136 .012,949 . .007,583 .002,773 .002,745 .002,706 .004,336 .002,980 .003,690 .010,699 .002,086 .002,446 .003,683 .007,583 .002,773 .002,745 .555,439 .458,775 .494,765 .488,123 .593,527 .483,741 .488,512	02,841 .004,129 .001,345 .004,220 .030,250 .069,630 .053,266 .000,737 .000,930 .003 02,057 .002,718 .001,132 .002,260 .011,120 .002,316 .005,929 .001,099 .051,640 .003 99,109 .579,985 .859,110 .532,306 .237,080 .411,744 .363,493 .024,036 .024,700 .163	1,420 .002,812 .002,089 .001,800 .018,410 .000,087 .000,866 .006,60 02,771 .005,763 .004,339 .003,392 .015,025 .007,609 .005,138 .008,3 67,179 .090,499 .170,474 .076,338 .009,046 .085,433 .338,400	56 .005,632 .014,186 .011,561 .002,195 .013,416 .002,591 .005,940 .00 97 .001,600 .013,721 .003,941 .037,250 .007,185 .003,767 .002,029 .02
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KANSAS DIRECT AND INDIRECT REQUIREMENTS MATRIX

____ Each column shows the direct and indirect requirements of all Kansas industries for the column industry to make a \$1 delivery to final demand.

KANSAS DIRECT AND INDIRECT REQUIREMENTS MATRIX

	FARMING	MINING CONSTRUCTION		MANUFACTURING	TRANSPORTATION UTILITI	DE HUOTESATE	
				ALL OF A CT OF TRO	TRANSPORTATION UTILITI	ES WHOLESALE RETAIL	F. I. R. E. SERVICES
DIRECT AND INDIRECT REQUIREMENTS PER DOLLAR OF DELIVERY TO FINAL DEMAND IN THE KANSAS ECONOMY, 1965	Sorghum Sorghum Wheat Wheat Other Grains Soybeans Bairy Products Poultry & Poultry Products Cattle Hogs Hogs	Agricultural Services Crude Oil & Natural Gas Oil & Gas Field Services Nonmetallic Mining Adintenance & Repair Maintenance & Repair Heavy Construction	Meat Products Dairy Products Grain Mill Products Other Food & Kindred Products Apparel Paper & Allied Products Printing & Publishing	Agricultural Chemicals Other Chemicals Rubber & Plastics Cement & Concrete Other Stone & Clay Primary Metals Primary Metals Fabricated Metals Construction Machinery Construction Machinery Food Products Machinery	Electrical Machinery Other Machinery Motor Vehicles Aerospace Trailer Coaches Other Transportation Other Manufacturing Motor Freight Motor Freight Communications	Groceries Groceries Farm Products Machinery & Equipment Other Wholesale Trade Gasoline Service Stations Eating & Drinking	Banking Other Finance Insurance & Real Estate Lodging Services Business Services Medical & Health Services Other Services
	1 2 3 4 5 6 7 8 9 10 11	12 13 14 15 16 17 18 19 20	21 22 23 24 25 26 27 2	8 29 30 31 32 33 34 35 36 37 38 39 40	41 42 43 44 45 46 47 48 49 50 51 5	2 53 54 55 56 57 58 59 60	61 62 63 64 65 66 67 68 69
Corn 1	1 1.023766 0.000032 0.000032 0.000030 0.000033 0.000010 0.097044 0.008530 0.041544 0.213861 0.000192 0.0	0.000017 0.000222 0.000206 0.000117 0.000082 0.000039 0.000036 0.000047 0.000	39 0.054474 0.053990 0.005133 0.001748 0.000002 0.000024 0.000006 0.00	0.000032 0.001282 0.000114 0.000009 0.000023 0.000013 0.000005 0.000018 0.000005 0.000005 0.000006 0.000007	.000004 0.000006 0.000028 0.000006 0.000053 0.000000 0.000017 0.000008 0.000035 0.000010 0.000026 0.00	0.0036 0.000037 0.000042 0.000127 0.000031 0.000051 0.000028 0.003749 0.0000	0.000022 0.000027 0.001252 0.000320 0.000037 0.000045 0.001437 0.000099 0.0002
Sorghum 2	2 0.000058 1.011611 0.000058 0.000075 0.000060 0.000033 0.132948 0.019311 0.164875 0.102982 0.001180 0.000041 0.000041 1.065731 0.000311 0.000043 0.000240 0.040811 0.068967 0.020136 0.070884 0.012166 0.000041 0	0.000033	75 0.107438 0.073974 0.032438 0.003710 0.000004 0.000045 0.000010 0.00 29 0.022753 0.022787 0.338084 0.024064 0.000003 0.000018 0.000005 0.00	0.0034 0.000063 0.002528 0.000208 0.000017 0.000042 0.000025 0.000009 0.000033 0.000009 0.000010 0.000011 0.000012 0.0022 0.000020 0.000592 0.000143 0.000009 0.000021 0.000016 0.000016 0.000012 0.000012 0.000005 0.000006 0.000007 0.000008 0.000007 0.000008 0.000007 0.000008 0.000007 0.000008 0.000007 0.000008 0.000007 0.000008 0.000007 0.000008 0.000007 0.000008 0.000007 0.000008 0.000007 0.000008 0.000009 0.0000000 0.000000 0.000000 0.000000 0.000000	.000007	0.000069 0.000087 0.000224 0.000055 0.000092 0.000052 0.006500 0.0001	383 0.000041 0.000048 0.002286 0.000623 0.000067 0.000083 0.002617 0.000181 0.0003
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Soybeans 5 Hay 6	5 0.000057 0.000057 0.000056 0.000052 1.047118 0.000015 0.014067 0.003074 0.001271 0.003689 0.000310 0.0 6 0.000053 0.000054 0.000053 0.001127 0.000055 1.000914 0.054658 0.000383 0.214873 0.000414 0.047354 0.0	0.000017	27 0.001337 0.008376 0.008342 0.162767 0.000004 0.000023 0.000008 0.00 39 0.120729 0.030425 0.001745 0.002385 0.000007 0.000047 0.000010 0.00	0030 0.000019 0.000389 0.000199 0.000011 0.000031 0.000021 0.000008 0.000016 0.000007 0.000008 0.000010 0.000011 00032 0.000069 0.002846 0.000193 0.000017 0.000041 0.000024 0.000008 0.000034 0.000010 0.000011 0.000011 0.000011	.000006	0.0057	0.000035 0.000041 0.002308 0.000102 0.000085 0.000065 0.000163 0.000178 0.0001
Dairy Products 7 Poultry & Poultry Products 8	7 0.000107 0.000108 0.000106 0.000087 0.000112 0.000020 1.000684 0.000166 0.000099 0.000221 0.000037 0.000088 0.000007 0.0000007 0.0000007 0.0000007 0.0000007 0.0000007 0.0000007 0.0000007 0.0000007 0.0000007 0.00000000	0.000030 0.000737 0.000688 0.000347 0.000282 0.000053 0.000077 0.000141 0.000	0.000241 0.556620 0.000440 0.007409 0.000008 0.000045 0.000016 0.00	0.000024 0.000024 0.0000380 0.000022 0.000070 0.000041 0.000017 0.000032 0.000014 0.000017 0.000021 0.000023	.000013 0.000021 0.000025 0.000015 0.000176 0.000001 0.000016 0.000024 0.000122 0.000034 0.000090 0.00	0.000142 0.000146 0.000494 0.000119 0.000185 0.000096 0.015812 0.0003	0.000079 0.000095 0.004258 0.000187 0.000115 0.000134 0.004004 0.000331 0.0022
Cattle 9	9 0.000275 0.000281 0.000276 0.000233 0.000286 0.000055 0.057092 0.000358 1.253585 0.000477 0.000111 0.000070 0.00000000	0.000185 0.001943 0.001808 0.001084 0.000709 0.000442 0.000363 0.000436 0.000	41 0.700583 0.031882 0.001090 0.011634 0.000020 0.000256 0.000052 0.00	0.00004 0.000009 0.000353 0.000025 0.000003 0.000009 0.000003 0.000001 0.000006 0.000002 0.0000002 0.000002 0.000002 0.000002 0.000002 0.000002 0.000002 0.0000002 0.000002 0.000002 0.000002 0.000002 0.000002 0.000002 0.0000002 0.000002 0.0000002 0.0000002 0.00000000	.000001 0.000002 0.000007 0.000003 0.000011 0.000000 0.000004 0.000002 0.000009 0.000003 0.000007 0.00 .000033 0.000053 0.000323 0.000058 0.000460 0.000003 0.000016 0.000072 0.000303 0.000091 0.000226 0.00	0010 0.000015 0.000019 0.000075 0.000016 0.000018 0.000007 0.002472 0.0000 0320 0.000291 0.000329 0.001037 0.000257 0.000432 0.000247 0.029141 0.0004	0.000009 0.000010 0.000239 0.000088 0.000009 0.000014 0.000291 0.000020 0.00000 0.000191 0.000228 0.010854 0.003892 0.000328 0.000418 0.013679 0.00366 0.0036
Hogs 10 Other Agricultural Products 11	0 0.000058 0.000059 0.000058 0.000049 0.000060 0.000012 0.000243 0.000075 0.000050 1.040570 0.000023 0.0 1 0.000021 0.000024 0.000024 0.0024593 0.000023 0.020528 0.001239 0.000162 0.004466 0.000176 1.074743 0.0	0.000040 0.000411 0.000383 0.000230 0.000150 0.000095 0.000078 0.000093 0.000	0.00011 0.00 0.00012 0.00012 0.00023 0.00004 0.00005 0.000011 0.00	0035 0.000084 0.003552 0.000212 0.000019 0.000045 0.000026 0.000009 0.000040 0.000010 0.000011 0.000011 0.000012	000007 0,000011 0.000070 0.000012 0.000097 0.000001 0.000029 0.000015 0.000064 0.000019 0.000048 0.00	0.0068 0.000061 0.000069 0.000218 0.000054 0.000091 0.000052 0.006107 0.0000	0.000040 0.000048 0.002295 0.000839 0.000070 0.000089 0.002908 0.000183 0.0000
Agricultural Services 12	2 0.022442 0.049719 0.064638 0.065629 0.015446 0.034160 0.072035 0.021035 0.034045 0.074041 0.020180 1.0	.014750 0.000163 0.000151 0.000101 0.000065 0.000050 0.000039 0.000042 0.00	0.030345 0.040088 0.022455 0.004897 0.000003 0.000026 0.000005 0.00	0.000042 0.000042 0.001823 0.000084 0.000009 0.000019 0.000010 0.000004 0.000019 0.000005 0.000005 0.000005 0.000005	.000003	0.00143	0.000324 0.000055 0.000305 0.000109 0.000022 0.000041 0.000387 0.000127 0.0001 0.00055 0.000022 0.000019 0.000879 0.000190 0.000029 0.000038 0.001257 0.00073 0.0001
	3 0.012675 0.018752 0.013545 0.033234 0.025828 0.012411 0.008475 0.010928 0.008717 0.010675 0.006271 0.0 4 0.001317 0.001948 0.001407 0.003451 0.002682 0.001289 0.000880 0.001135 0.000905 0.001109 0.000651 0.0	0.018184	17 0.007354 0.007553 0.006898 0.006831 0.000401 0.004024 0.000922 0.06 30 0.000764 0.000785 0.000717 0.000710 0.000042 0.000418 0.000096 0.00	0531 0.018779 0.002470 0.522988 0.002137 0.014205 0.001989 0.000829 0.000724 0.004947 0.002658 0.000797 0.000808 6285 0.001950 0.000257 0.054299 0.000222 0.004875 0.000224 0.00086 0.00075 0.000514 0.000277 0.00083 0.00084	.000432	997 0.017053 0.012189 0.011978 0.006416 0.005418 0.014993 0.004993 0.0044	888 0.001758 0.000879 0.010420 0.008233 0.002989 0.002000 0.001609 0.002215 0.0039
Nonmetallic Mining 15	5 0.000018 0.000019 0.000019 0.000021 0.000021 0.000009 0.000015 0.000009 0.000011 0.000013 0.000008 0.00	0.000010 0.000097 0.000102 1.005158 0.000594 0.000909 0.005613 0.046839 0.000	0.000015 0.000014 0.000015 0.000015 0.000002 0.000010 0.000004 0.00	0013 0.000012 0.000010 0.000058 0.000009 0.063308 0.003481 0.000019 0.000004 0.000015 0.000082 0.000011 0.000012	.000012 0.000009 0.000008 0.000006 0.000035 0.000001 0.000012 0.00049 0.000018 0.000018 0.000053 0.00	0.000030 0.000034 0.000036 0.000015 0.000044 0.000021 0.000020 0.0000	0.000183 0.000092 0.001110 0.000856 0.000311 0.000211 0.000168 0.000232 0.0002 0.000017 0.000010 0.000543 0.000049 0.000025 0.000570 0.000076 0.000059 0.00005
	0.000455		60 0.000360 0.000630 0.000379 0.000438 0.000080 0.000316 0.000133 0.00 16 0.007641 0.016760 0.007225 0.006690 0.009145 0.024693 0.008209 0.00	0316 0.000515 0.000365 0.008928 0.000357 0.010293 0.000608 0.000152 0.000109 0.000778 0.000215 0.000123 0.000151 1477 0.001782 0.003012 0.003298 0.001816 0.023016 0.013546 0.005746 0.003216 0.006561 0.004426 0.011031 0.012135	.000072	5158 0.023768 0.027904 0.012958 0.006540 0.003734 0.004848 0.003348 0.0034	0.000396 0.000177 0.000467 0.001891 0.000484 0.000355 0.000575 0.000281 0.0009
RUC	8 0.000000 0.000000 0.000000 0.000000 0.000000	0.000000 0.000000 0.000000 0.001013 0.000001 0.000001 1.007861 0.000047 0.000	01 0.000000 0.000000 0.000000 0.000000 0.000000	0000 0.000000 0.000000 0.000000 0.000000	.000000 0.000000 0.000000 0.000000 0.000000	0.0000 0.000000 0.000000 0.000000 0.000000	0.032476 0.006735 0.006968 0.006017 0.010800 0.011600 0.021173 0.022405 0.0427 0.000000 0.000000 0.000001 0.000000 0.000000 0.000000 0.000000 0.000000
Heavy Construction 19 Special Trade Construction 20	0.000025	0.000389 0.003030 0.003203 0.026592 0.034334 1.021806 0.402709 0.044062 1.019	0.0000407 0.000322 0.000629 0.000354 0.000076 0.000164 0.000095 0.00	0.000110 0.000098 0.000043 0.000013 0.000026 0.000146 0.000292 0.000024 0.000085 0.000170 0.000165 0.000172	.000211	9442 0.000275 0.000183 0.000266 0.000075 0.000421 0.000044 0.000044 0.0001 1392 0.000473 0.006355 0.012628 0.000178 0.007256 0.000715 0.000516 0.0053	0.000029 0.000027 0.000031 0.000072 0.000049 0.000101 0.000032 0.000021 0.0000661 0.000116 0.000170 0.000168 0.000762 0.003278 0.000384 0.003460 0.000518 0.0005
	0.000401 0.000411 0.000404 0.000340 0.000418 0.000080 0.001681 0.000521 0.000347 0.000694 0.000162 0.000192 0.000194 0.000195 0.000195 0.000050 0.000195 0.0	0.000274	55 1.046442 0.001122 0.001592 0.016759 0.000030 0.000378 0.000077 0.00	0242 0.000578 0.024546 0.001462 0.000133 0.000311 0.000180 0.000061 0.000279 0.000071 0.000073 0.000077 0.000084	.000048	0468 0.000423 0.000480 0.001508 0.000373 0.000630 0.000361 0.042206 0.0003	0.00018 0.00018 0.00018 0.00078 0.0003278 0.000384 0.003460 0.000518 0.000279 0.000279 0.000333) 0.015857 0.005798 0.000481 0.000613 0.020098 0.001266 0.0001
Grain Mill Products 23	3 0.000115 0.000115 0.000115 0.000960 0.000118 0.000746 0.124177 0.214980 0.062674 0.220823 0.037979 0.0	0.000048 0.000780 0.000720 0.000314 0.000227 0.000084 0.000081 0.000119 0.00	84 0.070844 0.069204 1.055525 0.034901 0.000010 0.000051 0.000015 0.00	0061 0.000057 0.001757 0.000399 0.000024 0.000059 0.000044 0.000017 0.000035 0.000014 0.000017 0.000023 0.000023	.000013	0208 0.000209 0.000264 0.000903 0.000217 0.000336 0.000175 0.028932 0.0010 0115 0.000261 0.000652 0.000245 0.000072 0.000152 0.000100 0.006338 0.0001	3 0.000145 0.000174 0.007736 0.000339 0.000208 0.000243 0.007389 0.000602 0.0041 95 0.000073 0.000076 0.004641 0.000526 0.000127 0.000128 0.002606 0.000362 0.0003
Other Food & Kindred Products 24 Apparel 25	4 0.000349 0.000352 0.000346 0.000322 0.000362 0.000095 0.086645 0.018932 0.007826 0.022726 0.001911 0.02726 0.000052 0.000055 0.000054 0.000064 0.000063 0.000030 0.000338 0.000547 0.000193 0.000572 0.000123 0.000572	0.000103	55 0.008237 0.051595 0.051386 1.002588 0.000024 0.000143 0.000047 0.00 50 0.000221 0.000203 0.002589 0.000125 1.000009 0.000018 0.000024 0.00	0186 0.000117 0.002394 0.001224 0.000069 0.000191 0.000131 0.000051 0.000097 0.000042 0.000051 0.000064 0.000071 0.00097 0.000057 0.000019 0.000476 0.000017 0.000059 0.000055 0.000010 0.000011 0.000150 0.000018 0.000027 0.000027	.000039 0.000063 0.000117 0.000037 0.000579 0.000003 0.000107 0.000043 0.000384 0.000102 0.000260 0.00	0349 0.005666 0.000564 0.001027 0.000269 0.000511 0.000327 0.030823 0.0005	54 0.000213 0.000255 0.014215 0.000626 0.000521 0.000399 0.001001 0.001094 0.0009
Paper & Allied Products 26	0.000795 0.001293 0.001538 0.004446 0.000727 0.003193 0.002970 0.002604 0.002013 0.0036\$1 0.127096 0.00	0.018002 0.002516 0.002462 0.007015 0.004142 0.000952 0.000937 0.001123 0.00	0.009781 0.025022 0.010703 0.002167 0.000725 1.030466 0.015125 0.00	0287 0.000748 0.027293 0.002065 0.000467 0.000691 0.000264 0.000107 0.002329 0.008194 0.000138 0.000327 0.000219	.001737	1588 0.012345 0.001345 0.001873 0.001747 0.001130 0.000919 0.002249 0.0012	00 0.000704 0.000538 0.011444 0.000993 0.000825 0.007923 0.000725 0.006027 0.0055
	17 0.001557 0.001753 0.001713 0.001388 0.002377 0.001093 0.001776 0.001317 0.001556 0.001812 0.001082 0.0 18 0.025495 0.027779 0.029472 0.059014 0.003390 0.006253 0.018819 0.038813 0.028198 0.028365 0.006796 0.3	0.001530	73 0.002092 0.002945 0.003535 0.002942 0.000214 0.000588 1.020137 0.00 33 0.020580 0.010729 0.010602 0.003479 0.000006 0.003645 0.000066 1.03	1439 0.000941 0.000537 0.002811 0.000580 0.002384 0.000601 0.000578 0.001562 0.004401 0.000826 0.001770 0.000890 8039 0.000726 0.004601 0.001310 0.001618 0.000100 0.000993 0.000008 0.00050 0.000144 0.028639 0.000516 0.000011	.000450 0.001524 0.000357 0.003099 0.001432 0.000046 0.000859 0.009031 0.002254 0.001439 0.014957 0.00 .000012 0.000012 0.000080 0.000130 0.000040 0.000001 0.000225 0.000094 0.000062 0.000037 0.000060 0.00	2447 0.005021 0.025187 0.011684 0.004269 0.027361 0.004724 0.002441 0.0254 0288 0.000142 0.000083 0.000103 0.000830 0.000046 0.000202 0.001377 0.0001	2 0.018912 0.017395 0.016370 0.003045 0.002490 0.034668 0.001110 0.014419 0.01089
Agricultural Chemicals 29	9 0.004617 0.003472 0.003322 0.009876 0.003175 0.001985 0.001661 0.000907 0.001610 0.002146 0.001814 0.0	0.000856 0.000432 0.000438 0.000083 0.000072 0.000022 0.000050 0.001256 0.00	0.001268 0.000952 0.003640 0.000730 0.000005 0.000025 0.000030 0.00	0939 1.011813 0.000046 0.000225 0.000014 0.000041 0.000021 0.000020 0.000012 0.000058 0.000044 0.000034 0.000012	.000008 0.000013 0.000008 0.000032 0.000024 0.000001 0.000070 0.000028 0.000023 0.000024 0.000496 0.00	0121 0.000396 0.001632 0.000226 0.000204 0.000050 0.001533 0.000305 0.0001	53 0.000084 0.000030 0.000129 0.001163 0.014726 0.004153 0.000426 0.000083 0.00018 53 0.000084 0.000030 0.000129 0.001163 0.014726 0.004153 0.000426 0.000083 0.00018
Other Chemicals 30 Petroleum & Coal Products 31	0.000454	0.007480	11 0.001335 0.000992 0.002064 0.003745 0.000036 0.010092 0.000971 0.00 52 0.010376 0.009658 0.010297 0.010476 0.000220 0.001096 0.000834 0.01	1366 0.021516 1.065677 0.003251 0.002466 0.003422 0.000156 0.000053 0.007810 0.000879 0.000475 0.000070 0.000050 7544 0.034822 0.001788 1.011667 0.001548 0.007405 0.001078 0.000652 0.000676 0.004298 0.001050 0.000740 0.000577	.000116	1634 0.000585 0.000561 0.000652 0.000319 0.000378 0.000617 0.000383 0.0003 5860 0.027123 0.018451 0.019719 0.010280 0.007306 0.024350 0.003264 0.0056	0.000278 0.000132 0.002364 0.003815 0.002904 0.006595 0.002991 0.002231 0.00023 08 0.000660 0.000506 0.018408 0.002715 0.002520 0.001554 0.001554 0.002331 0.00023
Rubber & Plastics 32 Cement & Concrete 33	0.000258	0.000131 0.002079 0.001969 0.015810 0.082441 0.000075 0.004607 0.001454 0.00	75 0.000178 0.000165 0.000197 0.000148 0.000020 0.000145 0.000056 0.00	0205 0.000151 0.000093 0.001661 1.000076 0.001820 0.000147 0.000050 0.000048 0.000847 0.013710 0.000045 0.000055	.000025 0.000050 0.000046 0.001876 0.000142 0.000003 0.000429 0.000129 0.003287 0.000095 0.000908 0.00	2486 0.000180 0.000229 0.000252 0.000087 0.000245 0.000302 0.000177 0.0001	34 0.000088 0.000070 0.001772 0.000291 0.000437 0.000192 0.000084 0.000174 0.00012
Other Stone & Clay 34	4 0.000300 0.000360 0.000318 0.000689 0.000566 0.000231 0.000233 0.000153 0.000192 0.000192 0.000147 0.000192 0	0.000060 0.000924 0.000864 0.041336 0.001827 0.013647 0.016509 0.004990 0.01	19 0.000173 0.000157 0.000154 0.000141 0.000011 0.000041 0.000024 0.00	0074 0.000038 0.000038 0.000508 0.001052 0.027072 1.000197 0.000025 0.000021 0.000605 0.019965 0.000047 0.000036	.000018	0.000103 0.000187 0.000264 0.000101 0.000346 0.000190 0.000059 0.0002 1341 0.000112 0.000218 0.000318 0.000279 0.000260 0.000288 0.001220 0.0002	9 0.000092 0.000113 0.009262 0.000334 0.000262 0.000207 0.000126 0.000710 0.00006 05 0.000089 0.000077 0.003006 0.000281 0.000644 0.000133 0.000702 0.001974 0.00008
Primary Metals 35 Fabricated Metals 36	0.000413 0.000490 0.000434 0.000908 0.000753 0.000292 0.000299 0.000199 0.000244 0.000256 0.000196 0.000196 0.000180 0.000186 0.000180 0.000186 0.000180 0.0	0.000089	19 0.000228 0.000202 0.000205 0.000188 0.000023 0.000060 0.000054 0.00 25 0.000109 0.000067 0.000103 0.000074 0.000013 0.000048 0.000020 0.00	0137 0.000104 0.000057 0.000829 0.000058 0.000316 0.000095 1.030991 0.002221 0.001105 0.025796 0.005343 0.002583 0114 0.000046 0.000035 0.000854 0.000034 0.000119 0.000084 0.000034 1.000046 0.001720 0.00059 0.000146 0.000062	.000065	1451 0.000163 0.000271 0.000298 0.000095 0.000249 0.000249 0.000123 0.0002	12 0.000129 0.000138 0.005363 0.000408 0.000830 0.000369 0.000118 0.000439 0.00013
Other Fabricated Metal Products 37	0.000443 0.000747 0.000835 0.001104 0.000565 0.000555 0.000887 0.000403 0.000517 0.000873 0.000439 0.000873	0.009134 0.006154 0.005478 0.002903 0.007528 0.020931 0.018046 0.002293 0.02	89 0.000499 0.000612 0.000456 0.000254 0.000523 0.000908 0.000104 0.00	0461 0.000277 0.000161 0.005824 0.000389 0.000615 0.008181 0.000731 0.000071 1.002243 0.000527 0.021052 0.013316	.001133 0.000638 0.000179 0.001459 0.042910 0.000012 0.009390 0.000282 0.000197 0.004158 0.000448 0.00	5276 0.001010 0.001328 0.003158 0.001053 0.000703 0.000478 0.000351 0.0004	32 0.000233 0.000089 0.001068 0.000575 0.000484 0.000211 0.000230 0.000954 0.00029
Farm Machinery 38 Construction Machinery 39	88 0.010014 0.012817 0.010692 0.028832 0.022485 0.009264 0.007983 0.005384 0.006732 0.006438 0.005489 0.0 9 0.000273 0.000275 0.000269 0.000214 0.000280 0.000036 0.000108 0.000058 0.000090 0.000128 0.000040 0.0	0.000088	33	0043 0.000052 0.000153 0.000099 0.000020 0.000057 0.000055 0.000066 0.000016 0.000038 1.000046 0.000084 0.000049 0139 0.000049 0.000041 0.000956 0.000043 0.000096 0.000100 0.000039 0.000174 0.000024 0.000035 1.000046 0.000053	.000052	0125	9 0.000061 0.000049 0.000593 0.001855 0.024633 0.000228 0.000778 0.000063 0.00029
	0.000283 0.000309 0.000284 0.000317 0.000344 0.000084 0.000132 0.000098 0.000116 0.000156 0.000063 0.0	0.000123 0.005707 0.005209 0.000896 0.000386 0.000082 0.000106 0.000308 0.00	82 0.000189 0.000114 0.000157 0.000127 0.000015 0.000076 0.002313 0.00	0368 0.000129 0.000056 0.002880 0.000047 0.000164 0.000401 0.000067 0.000039 0.000060 0.000065 0.000062 1.000067	.000049 0.000054 0.000065 0.000025 0.000417 0.000003 0.000046 0.001159 0.000283 0.000419 0.000257 0.00	0.000192 0.000227 0.000199 0.000102 0.000369 0.000257 0.000082 0.0003	07 0.000145 0.000160 0.009712 0.000382 0.000251 0.000301 0.000097 0.000774 0.00010
Other Machinery 42	2 0.000701 0.000808 0.000730 0.001319 0.001140 0.000422 0.000489 0.000339 0.000412 0.000455 0.000385 0.000701 0.000808 0.000730 0.001319 0.001140 0.000422 0.000489 0.000339 0.000412 0.000455 0.000385 0.000730 0.000750 0.000750 0.000750 0.000750 0.000750 0.000750 0.000750 0.000750 0.000750 0.000750 0.000750 0	0.000191 0.005678 0.005215 0.012934 0.006066 0.009973 0.004374 0.002497 0.00	53 0.000445 0.000377 0.000430 0.000419 0.000350 0.000191 0.001093 0.00	0.00023 0.000022 0.00002 0.00003 0.000003 0.000000 0.000000 0.000000 0.000000 0.000000	.000934 1.000406 0.000244 0.019466 0.001868 0.000009 0.000224 0.003198 0.000487 0.002433 0.014321 0.00	1490 0.000218 0.000374 0.001509 0.000861 0.000337 0.000268 0.000143 0.0002 1332 0.000591 0.001084 0.001030 0.000403 0.000677 0.000636 0.000323 0.0005	9 0.000143 0.000139 0.000494 0.000275 0.000118 0.000472 0.000194 0.000459 0.00015 04 0.000596 0.000675 0.012809 0.001048 0.001259 0.002497 0.000238 0.001124 0.00050
Motor Vehicles 43 Aerospace 44	3 0.000021 0.000025 0.000022 0.000049 0.000040 0.000018 0.000018 0.000011 0.000016 0.000014 0.000012 0.4 0.000005 0.000006 0.000006 0.000010 0.000008 0.000004 0.000005 0.000003 0.0000003 0.0000003 0.0000003 0.0000003 0.00000000	0.000004	03 0.000013 0.000011 0.000010 0.000009 0.000000 0.000002 0.000001 0.00 31 0.000003 0.000004 0.000003 0.000003 0.000003 0.000003 0.000006 0.00	0002 0.000001 0.000002 0.000013 0.000001 0.000041 0.000004 0.000001 0.000001 0.000002 0.001529 0.000001 0.000001 0004 0.00004 0.000010 0.000011 0.000011 0.000026 0.000013 0.000002 0.000119 0.001279 0.000170 0.000458 0.000019	.000001	0.00004 0.00004 0.000003 0.000087 0.000005 0.000014 0.000005 0.0000	0.000002 0.000002 0.000013 0.000011 0.000042 0.000005 0.000003 0.000011 0.00000
Trailer Coaches 45	0.000242 0.000243 0.000238 0.000189 0.000247 0.000032 0.000096 0.000051 0.000080 0.000113 0.000035 0.000113	0.000046 0.001650 0.001509 0.000491 0.000347 0.000067 0.000071 0.000152 0.00	67 0.000138 0.000079 0.000121 0.000088 0.000014 0.000058 0.000022 0.00	0122 0.000043 0.000036 0.000839 0.000038 0.000085 0.000088 0.000034 0.000032 0.000021 0.000030 0.000040 0.000046	0.000025 0.000040 0.000056 0.000008 1.000411 0.000001 0.000025 0.000020 0.000253 0.000066 0.000152 0.00	0.000090 0.000112 0.000108 0.000063 0.000261 0.000195 0.000055 0.0002	35 0.000099 0.000123 0.010302 0.000357 0.000245 0.000218 0.000092 0.000781 0.00006
Other Transportation Equipment 46 Other Manufacturing 47	66 0.000022 0.000027 0.000026 0.000039 0.000035 0.000022 0.000035 0.000028 0.000025 0.000027 0.000027 0.0000473 0.000567 0.000601 0.000662 0.000536 0.000466 0.000718 0.000430 0.000603 0.000679 0.000389 0.000470 0.000679 0.000679 0.000389 0.000679 0.0000679 0.0000679 0.0000679 0.0000679 0.0000679 0.0000679 0.	0.000040 0.000236 0.000302 0.000254 0.000144 0.000015 0.000056 0.000103 0.00 0.003914 0.003822 0.003729 0.003520 0.005934 0.008802 0.007234 0.005133 0.00	15 0.000051 0.000030 0.000060 0.000080 0.000008 0.000034 0.000022 0.00 84 0.000673 0.000559 0.000854 0.000428 0.002240 0.000264 0.000208 0.00	0088 0.000100 0.000072 0.000132 0.000015 0.000031 0.000106 0.000205 0.000019 0.000071 0.000123 0.000118 0.000130 0.00476 0.000272 0.000208 0.002318 0.000358 0.000550 0.000563 0.000249 0.000150 0.000790 0.000977 0.000600 0.000316	.000154 0.000058 0.000049 0.00034 0.000171 1.000013 0.000099 0.007216 0.000051 0.000060 0.001075 0.00 .000073 0.000136 0.000100 0.002430 0.011465 0.000018 1.003376 0.000216 0.000850 0.008654 0.002756 0.00	0.000211 0.000153 0.000193 0.000066 0.000287 0.000045 0.000042 0.0000001248 0.000414 0.005198 0.006714 0.004980 0.001828 0.000926 0.000751 0.0014	0.000041 0.000042 0.000036 0.000076 0.000034 0.000149 0.000019 0.000021 0.00004 0.0011277 0.001438 0.002530 0.000727 0.000412 0.000714 0.003931 0.003853 0.00677
Z.	8 0.002415 0.002880 0.002869 0.003825 0.003797 0.002279 0.004130 0.003169 0.002777 0.003561 0.002742 0.00000000000000000000000000000000000	1000	91 0.006444 0.003282 0.007654 0.010343 0.000609 0.004202 0.001810 0.00	9320 0.010987 0.009717 0.003627 0.001287 0.001927 0.014568 0.029134 0.002355 0.008461 0.016938 0.016446 0.017196	0.021075 0.007677 0.006090 0.004209 0.023423 0.001835 0.013417 1.037448 0.006162 0.007149 0.063999 0.04	3784 0.027434 0.016106 0.022294 0.007493 0.039709 0.004147 0.004280 0.0111	183 0.002892 0.002651 0.003020 0.006930 0.003777 0.009953 0.002037 0.001949 0.00368
AT	9 0.006952 0.009371 0.007720 0.014811 0.007470 0.008165 0.005460 0.007635 0.006865 0.007605 0.006424 0.00 0.000397 0.000815 0.000418 0.001034 0.000880 0.000413 0.000243 0.000319 0.000274 0.000335 0.000240 0.000319 0.000		89 0.000256 0.000242 0.000242 0.000239 0.000122 0.000305 0.000111 0.00	4284 0.015782 0.014585 0.017840 0.001207 0.019256 0.012506 0.008135 0.008985 0.013817 0.002201 0.001666 0.003583 00462 0.000741 0.000133 0.017737 0.000039 0.000230 0.000127 0.000257 0.000058 0.000147 0.000117 0.000083 0.000223	0.001179	9415 0.006654 0.019239 0.033433 0.004484 0.042350 0.022947 0.002575 0.0113 0534 0.000600 0.000551 0.000723 0.000263 0.000340 0.000651 0.000112 0.0002	0.001842
Ĕ E	0.003632 0.003843 0.004047 0.005741 0.003804 0.003431 0.005381 0.004872 0.004815 0.005384 0.010434 0.005382 0.013193 0.012349 0.016710 0.033512 0.018241 0.020118 0.026196 0.015786 0.013162 0.012137 0.012525 0.012525 0.0		47 0.006010 0.007198 0.007798 0.009750 0.005713 0.005687 0.015779 0.01 25 0.012570 0.025648 0.013495 0.016162 0.003666 0.014289 0.005866 0.00	7918 0.032707 0.005546 0.005524 0.007470 0.005938 0.004613 0.003823 0.004087 0.014606 0.007902 0.005993 0.016089 7756 0.010405 0.016232 0.026148 0.016137 0.006419 0.014098 0.006296 0.004722 0.034727 0.009055 0.004988 0.006520	.011995 0.006716 0.009187 0.006480 0.012399 0.000176 0.007918 0.007283 0.009752 0.014283 1.069305 0.00	8913 0.024600 0.062288 0.058281 0.020816 0.014599 0.019516 0.014053 0.0102	0.033220 0.038184 0.020757 0.034569 0.010438 0.133298 0.005962 0.010475 0.02761
Groceries 53	33 0.000403 0.000318 0.000469 0.000424 0.000452 0.000406 0.002384 0.002011 0.001217 0.002199 0.000631 0.	0.000657 0.001106 0.001080 0.001102 0.000983 0.000136 0.000242 0.000880 0.00	36 0.002649 0.001493 0.008376 0.012529 0.000030 0.000129 0.000094 0.00	0129 0.000107 0.000169 0.000634 0.000084 0.000227 0.000120 0.000057 0.000081 0.000124 0.000067 0.000119 0.000072	.002813	2633 1.002389 0.035914 0.001470 0.001035 0.000961 0.005713 0.034361 0.0233	373 0.018132 0.007895 0.010347 0.087409 0.021065 0.013195 0.011915 0.011787 0.04323 308 0.000238 0.000279 0.004778 0.002527 0.028499 0.000559 0.004884 0.000598 0.00214
	64 0.004257 0.000916 0.005991 0.003584 0.003840 0.006609 0.014185 0.015491 0.017006 0.017577 0.007150 0.005335 0.006990 0.006315 0.007317 0.009959 0.004446 0.005964 0.004118 0.004709 0.006388 0.004525 0.005964 0.00418 0.004709	0.014356	02 0.021722 0.008040 0.062407 0.010819 0.000036 0.000142 0.000070 0.00 99 0.010759 0.012043 0.011012: 0.010458 0.005362 0.008729 0.005499 0.00	0110 0.000129 0.000674 0.000434 0.000125 0.000141 0.000140 0.000076 0.000070 0.000244 0.000090 0.000088 0.000081 07227 0.007134 0.010999 0.014862 0.010843 0.009799 0.005717 0.003499 0.006179 0.003941 0.006782 0.007181 0.004019	0.000051 0.000095 0.000117 0.000082 0.000169 0.000004 0.000261 0.000811 0.000153 0.000659 0.001137 0.00 0.002505 0.007339 0.000800 0.014602 0.007947 0.002296 0.008926 0.001294 0.005330 0.001136 0.002267 0.00	7700 0.000585 1.103619 0.000798 0.000284 0.001214 0.005322 0.018086 0.0067 3458 0.005633 0.012464 1.006381 0.003565 0.138278 0.006225 0.017339 0.01233	4 0.000214 0.000178 0.002435 0.001023 0.003083 0.000356 0.000735 0.000324 0.00041
Other Wholesale Trade 56	66 0.025225 0.024937 0.023297 0.017424 0.019982 0.028102 0.038530 0.021205 0.047221 0.025847 0.030745 0.	0.025973 0.006368 0.010591 0.012945 0.018020 0.010423 0.011476 0.026533 0.01	0.041382 0.024120 0.023657 0.018442 0.000855 0.007851 0.005182 0.00	0.003662 0.004643 0.005232 0.001940 0.006309 0.005359 0.001712 0.004932 0.003172 0.003621 0.005483 0.003520	0.001375 0.003478 0.000276 0.001120 0.001593 0.000240 0.006058 0.001883 0.020191 0.001245 0.002740 0.00	3840 0.005495 0.007707 0.006309 1.003520 0.003375 0.078063 0.016532 0.0806	0.003070 0.001313 0.002573 0.029430 0.004874 0.018617 0.007651 0.006070 0.00614 0.000781 0.000787 0.003365 0.006056 0.008009 0.008208 0.006381 0.005153 0.00678
Farm Equipment Dealers 57 Gasoline Service Stations 58	0.024693 0.035447 0.030999 0.018026 0.054541 0.017938 0.019553 0.008889 0.017032 0.020443 0.014489 0. 8 0.004942 0.007872 0.005136 0.013028 0.011764 0.005064 0.002623 0.003606 0.002996 0.003947 0.002270 0.		0.012788	00006 0.000009 0.000340 0.000039 0.000003 0.000008 0.000005 0.000002 0.000005 0.000002 0.0000002 0.000002 0.000002 0.000002 0.000002 0.000002 0.000002 0.0000002 0.0000002 0.0000002 0.0000002 0.00000000	.000001 0.000002 0.000008 0.000003 0.000022 0.000000 0.000376 0.000002 0.000012 0.000007 0.000010 0.000007 0.000097 0.000327 0.000072 0.000129 0.000368 0.000021 0.000212 0.002581 0.003923 0.001979 0.000793 0.00000000000000000000000000000000000	0012 0.000062 0.000022 0.000042 0.000012 1.000018 0.000010 0.001167 0.0000 0607 0.006966 0.004821 0.005100 0.002632 0.004237 1.001809 0.001023 0.0038	026 0.000011 0.000009 0.000432 0.000081 0.000014 0.000015 0.000343 0.000035 0.000253 032 0.000223 0.000147 0.004979 0.003812 0.012645 0.006389 0.001339 0.001338 0.00035
	9 0.000485 0.000533 0.000515 0.000551 0.000647 0.000420 0.000603 0.000416 0.000589 0.000544 0.000529 0.	0.000661 0.003634 0.004188 0.008519 0.008177 0.000885 0.002033 0.004724 0.00	0.000786 0.002277 0.000915; 0.000819 0.000177 0.001335 0.000462 0.00	0.000361 0.000428 0.002180 0.000388 0.002145 0.000299 0.000156 0.001169 0.000308 0.000260 0.000279 0.000221	0.000121 0.000271 0.000079 0.000728 0.000453 0.000068 0.000339 0.000329 0.001214 0.000293 0.001372 0.00	1662 0.003841 0.006186 0.028442 0.005749 0.004817 0.000888 1.000954 0.0017	0.002441 0.002784 0.003564 0.002544 0.000829 0.002709 0.000530 0.000574 0.000368
	0.000344 0.000419 0.000366 0.000455 0.000519 0.000318 0.000390 0.000267 0.000388 0.000333 0.000340 0.000310 0.0007270 0.007270 0.00493 0.004460 0.005096 0.007368 0.005821 0.005910 0.004567 0.005644 0.004491 0.001982 0.004491 0.001982 0.004491 0.001982 0.004491 0.001982 0.004491 0.001982 0.004491 0.001982 0.004491 0.004491 0.001982 0.004491 0.004491 0.001982 0.004491 0.0		0.000380	2788 0.003682 0.004923 0.016766 0.014007 0.005992 0.003736 0.002621 0.001624 0.005396 0.002068 0.005372 0.018197	.000066	2059 0.009529 0.000926 0.000733 0.004530 0.003363 0.002314 0.006879 1.0037 2078 0.007109 0.016718 0.017195 0.009447 0.009594 0.005384 0.002604 0.0080	0.000341 0.002540 0.001399 0.000623 0.001638 0.002145 0.004657 0.008011 0.005602 197 1.009988 0.042416 0.004874 0.012133 0.002388 0.010595 0.005349 0.008126 0.000647
	52 0.001325 0.001039 0.000990 0.000842 0.001389 0.000704 0.000773 0.000446 0.000714 0.000592 0.000317 0.		0.000753 0.000570 0.0006133 0.000544 0.000111 0.001114 0.000140 0.00	04406 0.000157 0.000188 0.002108 0.000222 0.000299 0.000283 0.000152 0.000107 0.000128 0.000132 0.000232 0.000299	0.000108 0.000208 0.000169 0.000121 0.000981 0.000006 0.000126 0.001669 0.000716 0.002845 0.000647 0.00	0666 0.009098 0.000982 0.000752 0.000368 0.003366 0.001226 0.001599 0.0032	222 0.008686 1.000799 0.022985 0.001167 0.000908 0.000725 0.003276 0.011949 0.000263
Insurance & Real Estate 63 Lodging Services 64	63 0.023917 0.024073 0.023552 0.018690 0.024468 0.003130 0.009460 0.005061 0.007880 0.011167 0.003490 0. 64 0.000520 0.000555 0.000534 0.000552 0.000655 0.000375 0.000574 0.000387 0.000553 0.000522 0.000364 0.		0.013601 0.007846 0.011959) 0.008658 0.001338 0.005713 0.002173 0.01 46 0.000747 0.001078 0.000870 0.000945 0.000158 0.000343 0.000255 0.00	2099 0.004238 0.003596 0.082965 0.003721 0.008418 0.008703 0.003329 0.003153 0.002035 0.003009 0.003965 0.004594 00496 0.000307 0.000360 0.002479 0.000368 0.001486 0.005716 0.000147 0.000357 0.000818 0.000729 0.000289 0.000227	.002504	0.008911 0.011057 0.010719 0.006247 0.025837 0.019305 0.005440 0.0232 0670 0.003440 0.005757 0.025460 0.005234 0.003760 0.000829 0.002121 0.0017	0.009807 0.012152 1.018537 0.035295 0.024207 0.021588 0.009077 0.077262 0.00650
93	0.002891 0.003113 0.002965 0.003091 0.003403 0.003134 0.003935 0.002468 0.004750 0.002973 0.003195 0.	0.003120	0.003619 0.002991 0.003021 0.002551 0.000236 0.000365 0.001576 0.00	00746 0.001042 0.000448 0.001699 0.000601 0.001928 0.000881 0.000327 0.000358 0.000835 0.000453 0.002044 0.000534	0.000410 0.000422 0.000282 0.000818 0.000586 0.000034 0.000550 0.000769 0.000937 0.000690 0.027983 0.00	0891 0.023812 0.020879 0.012664 0.006978 0.002443 0.102839 0.011546 0.0073	68 0.001968 0.001492 0.003215 0.073539 1.007292 0.007964 0.026324 0.000784 0.010793
Medical & Health Services 67	0.002483 0.002473 0.002608 0.002424 0.002499 0.002613 0.003848 0.003231 0.004043 0.003801 0.003082 0.003801 0.003082 0.003801 0.003082 0.003801 0.003082 0.003801 0.003082 0.003801 0.003082 0.003801 0.003082 0.003801 0.0	0.000086	0.000116 0.000106 0.000115 0.000109 0.000019 0.000076 0.000044 0.00	0.003304 0.001070 0.004904 0.001089 0.001382 0.001285 0.003831 0.001352 0.002533 0.002851 0.000600 0.000774 0.00169 0.000115 0.000066 0.000956 0.000047 0.000349 0.000103 0.000102 0.000046 0.000105 0.000081 0.000085 0.000092	.000410	6161 0.009663 0.015815 0.008239 0.004653 0.002332 0.003317 0.003827 0.0072 1068 0.000289 0.000292 0.000570 0.000184 0.000358 0.000496 0.011750 0.0067	239 0.013824 0.001871 0.008939 0.020157 0.003237 1.056785 0.001651 0.017390 0.004570
Other Services 68 Education 69	58 0.002203 0.00266 0.002384 0.002627 0.003639 0.001761 0.002415 0.001671 0.002126 0.002272 0.001602 0. 59 0.000114 0.000116 0.000113 0.000095 0.000122 0.000029 0.000061 0.000035 0.000054 0.000064 0.000064 0.000034 0.	0.002010 0.006765 0.008712 0.007099 0.005606 0.005867 0.013672 0.020633 0.00 0.000042 0.000822 0.000775 0.000622 0.000545 0.000061 0.000100 0.000258 0.00	0.003773	0.001046	0.001359 0.001781 0.000364 0.001971 0.001228 0.000077 0.001904 0.001245 0.006922 0.022290 0.013643 0.00	3092 0.008031 0.024533 0.027719 0.011192 0.032095 0.069003 0.004459 0.0081	108 0.020435 0.016657 0.016120 0.022589 0.008488 0.011719 0.007319 1.022457 0.006718
	0.00001	0.00233 0.00	0.000022	0.000015 0.000017 0.000020 0.000026 0.000026	0.000025 0.000025 0.000075 0.000178 0.000002 0.000021 0.000025 0.000135 0.000045 0.000131 0.00	0.000243 0.000212 0.000770 0.000299 0.000264 0.000133 0.025378 0.0117	0.000105 0.000148 0.004177 0.000213 0.000137 0.000180 0.000930 0.000416 1.021245

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KANSAS DIRECT, INDIRECT, AND INDUCED REQUIREMENTS MATRIX

Each column shows the direct, indirect, and induced effects on all Kansas industries of a \$1 delivery of the column industry to final demand.

KANSAS DIRECT, INDIRECT AND INDUCED REQUIREMENTS MATRIX

	FARMING	MINING CONSTRUCTION		MANUFACTURING	TRANSPORTATION UTILITIE	S WHOLESALE RETAIL F. I. R. E. SERVICES
	Poultry & Other Other Dairy Poultry Agric. Agric. Corn Sorghum Wheat Grains Soybeans Hay Products Products Cattle Hogs Products Service		Other Grain Food & Paper & Printing Pet. & Pet. & Paper & Printing Pet. & Pet. & Paper & Printing Pet. & Pet. & Pet. & Products Product	Rubber Cement Other Fab. Food Food Food Food Food Food Food Fab. Food Food Food Food Food Food Food Foo	Other Rail- Elect Transp. Other road Motor Other Communi- Sanita	ric 6 Machinery Other Farm Gasoline Eating Other Ins. 8 Medical ary Farm 8 Wholesale Equip. Service 8 Retail Other Real Lodging Personal Business 8 Health Other
	1 2 3 4 5 6 7 8 9 10 11 12	13 14 15 16 17 18 19	21 22 23 24 25 26 27 28 29 30 31	Plastics Concrete & Clay Metals Metals Products Machinery Machinery Machinery Machinery Machinery Machinery Wachinery Vehicles Space Coaches 32 33 34 35 36 37 38 39 40 41 42 43 44 45	Equip. Mfg. Transp. Freight Transp. cations Servi	Ges Groceries Products Equip. Trade Dealers Stations Drinking Trade Banking Finance Estate Services Services Services Services Services Education Services Services Services Services Services Services Education Services
LGRN 1	1.024985 0.001276 0.001280 0.001336 0.001434 0.001602 0.098182 0.009763 0.042706 0.215012 0.001298 0.00099	96 0.000843 0.001792 0.000695 0.000659 0.000760 0.000825 0.001192 0.0	60 0.055628 U.054988 0.005902 0.002453 0.000886 D.C00740 0.000846 0.000572 0.000513 0.001826 0.00065	0.000523 0.000855 0.000955 0.000712 0.000761 0.000723 0.000724 0.000824 0.000794 0.000652 0.000837 0.000629 0.001071 0.000655	0.000169 0.000803 0.001095 0.000684 0.000744 0.001027 0.001	147 0.001458 0.001115 0.001286 0.001764 0.001422 0.001562 0.004997 0.001474 0.001362 0.001499 0.002499 0.001392 0.001622 0.001000 0.002821 0.001358 0.00192
SORGHUM 2 WHEAT 3	0.002170 1.013765 0.002221 0.002337 0.002487 0.002792 0.134920 0.021446 0.166888 0.104977 0.003097 0.00173 0.000851 0.000867 1.066560 0.001178 0.000973 0.001297 0.041568 0.069786 0.020908 0.071649 0.012900 0.00066	5 0.001482 0.003123 0.001215 0.001148 0.001325 0.001434 0.002069 0.00 67 0.000693 0.001311 0.000497 0.000465 0.000508 0.000552 0.000803 0.0	0.00133 0.0033770 0.004931 0.001536 0.001287 0.001467 0.000992 0.000895 0.003471 0.001130 0.0023520 0.023450 0.338594 0.024533 0.000590 0.000494 0.000564 0.000389 0.000339 0.000954 0.000494	0.000907 0.001484 0.001656 0.001235 0.001322 0.001254 0.001256 0.001428 0.001376 0.00131 0.001451 0.001095 0.001856 0.001139 0.000350 0.000574 0.000641 0.000476 0.000506 0.000482 0.000484 0.000550 0.000531 0.000435 0.000559 0.000418 0.000712 0.000471	0.000293 0.001415 0.001897 0.001188 0.001290 0.001782 0.001	991 0.002532 0.001946 0.002231 0.003057 0.002467 0.002709 0.008641 0.002543 0.002362 0.002599 0.004446 0.002481 0.002815 0.001737 0.005014 0.002362 0.003262
OTHER GRAINS 4 SOYBEANS 5	0.000061 0.00063 0.000063 1.001262 0.000071 0.001079 0.000117 0.000069 0.000275 0.000066 0.052399 0.00005	34 0.000039 0.000086 0.000036 0.000039 0.000048 0.000050 0.000065 0.00	148 0.000743 0.000084 0.000074 0.000048 0.000047 0.000037 0.000042 0.000028 0.000025 0.000057 0.00003	0.000026 0.000043 0.000048 0.000035 0.000038 0.000037 0.000031 0.000040 0.000033 0.000042 0.000030 0.000056 0.000046	0.000008 0.001386 0.000054 0.000034 0.000048 0.000054 0.0000	0.000078 0.000062 0.000073 0.000094 0.000072 0.000078 0.000072 0.000072 0.000082 0.000077 0.000078 0.000080 0.000049 0.000088 0.000069 0.000094
HAY 6	0.002017 0.002058 0.002065 0.003231 0.002312 1.003480 0.056493 0.002368 0.216745 0.002270 0.049137 0.00168	16 0.001376 0.002903 0.001139 0.001074 0.001251 0.001347 0.001933 0.0	151 0.122590 0.032034 0.002983 0.003521 0.001431 0.001202 0.001365 0.000923 0.000842 0.003723 0.001056	0.000655 0.001074 0.001201 0.000895 0.000946 0.000907 0.000909 0.001035 0.000998 0.000819 0.001052 0.000773 0.001341 0.000848 0.000845 0.001382 0.001541 0.001149 0.001233 0.001168 0.001169 0.001328 0.001280 0.001052 0.001350 0.001026 0.001730 0.001071	0.000212 0.001002 0.001369 0.000875 0.000936 0.001296 0.0014 0.000273 0.002510 0.001765 0.001104 0.001209 0.001661 0.0011	449 0.002701 0.001436 0.001619 0.002215 0.001801 0.001975 0.006567 0.001836 0.001713 0.001887 0.003871 0.001445 0.002072 0.001261 0.001896 0.001755 0.002281
CAIRY PRODUCTS 7 POULTRY & POULTRY PRODUCTS 8	0.004494 0.004583 0.004599 0.004785 0.005153 0.005749 1.004780 0.004601 0.004280 0.004365 0.004015 0.00355 0.000412 0.000422 0.000422 0.000440 0.000473 0.000531 0.000431 1.000424 0.000395 0.000401 0.000372 0.000335	4 0.002975 0.006394 0.002425 0.002359 0.002649 0.002917 0.004260 0.00 31 0.000255 0.000574 0.000231 0.000222 0.000251 0.000274 0.000399 0.0	49 0.004397 0.560210 0.003206 0.009946 0.003189 0.002621 0.003042 0.002050 0.001752 0.002000 0.002301 51 0.015448 0.000369 0.000297 0.000798 0.000295 0.000246 0.000281 0.000188 0.000169 0.000536 0.000204	0.001871 0.003064 0.003429 0.002563 0.002708 0.002599 0.002604 0.002963 0.002855 0.002345 0.003011 0.002189 0.003848 0.002343	0.000609 0.002844 0.003936 0.002457 0.002673 0.003691 0.004	111 0.005257 0.004004 0.004664 0.006354 0.005118 0.005616 0.020301 0.005564 0.004899 0.005394 0.008746 0.004046 0.005822 0.003568 0.008982 0.004860 0.008382
CATTLE 9 H0GS 10	0.010264 0.010470 0.010507 0.010930 0.011764 0.013100 0.066422 0.010457 1.263107 0.009915 0.009176 0.00820 0.002321 0.002368 0.002376 0.002473 0.002661 0.002967 0.002357 0.002363 0.002208 1.042708 0.002077 0.00189	0.007038 0.014798 0.005816 0.005439 0.006350 0.006831 0.009815 0.00	0.710046 0.040060 0.007390 0.017410 0.007265 0.006128 0.006942 0.004699 0.004322 0.020895 0.005384	0.004300 0.007035 0.007840 0.005841 0.006282 0.005935 0.005941 0.006753 0.006509 0.005352 0.006865 0.005252 0.008784 0.005392	0.001387 0.006582 0.008977 0.005619 0.006100 0.008434 0.0094	0.000474 0.000478 0.000474 0.0
OTHER AGRICULTURAL PRODUCTS 11	0.001261 0.001289 0.001295 0.025921 0.001448 0.022147 0.002399 0.001417 0.005649 0.001347 1.075673 0.00111	13 0.000793 0.001769 0.000746 0.000799 0.000993 0.001021 0.001335 0.00	93 0.015261 0.001722 0.001526 0.000989 0.000963 0.000754 0.000865 0.000581 0.000511 0.001168 0.00063	0.000973 0.001591 0.001774 0.001323 0.001421 0.001344 0.001345 0.001529 0.001474 0.001212 0.001554 0.001186 0.001989 0.001215 0.000536 0.000880 0.000979 0.000729 0.000771 0.000756 0.000761 0.000852 0.000813 0.000669 0.000853 0.000626 0.001158 0.000940	0.000314 0.001490 0.002033 0.001268 0.001381 0.001907 0.002 0.003173 0.028466 0.001113 0.000694 0.000987 0.001112 0.001	132 0.002701 0.002062 0.002370 0.003271 0.002636 0.002900 0.008423 0.002662 0.002528 0.002782 0.004610 0.002829 0.003014 0.001861 0.005477 0.002521 0.003177 0.001503 0.001573 0.001573 0.001271 0.001636 0.001797 0.001471 0.001928
AGRICULTURAL SERVICES 12 CRUDE OIL & NATURAL GAS 13	0.023558 0.050858 0.065782 0.066825 0.016729 0.035618 0.073078 0.022164 0.035109 0.075096 0.021193 1.01564	71 0.000732 0.001603 0.000629 0.000594 0.000710 0.000762 0.001090 0.00 71 1.050321 0.057135 0.104537 0.017475 0.009594 0.013022 0.047973 0.0	10 0.031403 0.041002 0.023159 0.005543 0.000812 0.000682 0.000775 0.000521 0.000481 0.002321 0.000574	0.000479 0.000782 0.000872 0.000652 0.000700 0.000663 0.000663 0.000753 0.000726 0.000597 0.000766 0.000585 0.000982 0.000595	0.000155 0.001253 0.001062 0.000619 0.000684 0.000938 0.0010	0.45 0.001350 0.001025 0.001152 0.001611 0.001292 0.001425 0.003735 0.001336 0.001249 0.001367 0.002021 0.001172 0.001481 0.000912 0.002524 0.001226 0.001731
OIL & GAS FIELD SERVICES 14	0.002597 0.003254 0.002718 0.004822 0.004153 0.002961 0.002078 0.002430 0.002126 0.002318 0.001818 0.00291	7 0.109046 1.007241 0.015809 0.002139 0.001037 0.001570 0.005376 0.00	0.001977 0.001835 0.001525 0.001451 0.000971 0.001175 0.000980 0.006865 0.002454 0.000828 0.054862	0.000761 0.005754 0.001215 0.000830 0.000856 0.001269 0.001032 0.000943 0.000913 0.000733 0.001015 0.000762 0.001279 0.000764	0.000183 0.000985 0.001787 0.001581 0.001293 0.001407 0.0129	0.003268 0.002308 0.002463 0.002485 0.002003 0.003168 0.001830 0.001926 0.001596 0.001596 0.001596 0.001596 0.001596 0.001596 0.001596 0.001492 0.001977 0.001977 0.001215 0.001624 0.001558 0.002193
NONMETALLIC MINING 15 OTHER MINING 16	0.000082 0.000085 0.000085 0.000089 0.000093 0.000092 0.000034 0.000077 0.000074 0.000073 0.000084 0.000084 0.000084 0.000084 0.0001142 0.001142 0.001238 0.001240 0.001907 0.001580 0.001500 0.001294 0.001161 0.001041 0.001047 0.000974 0.001088	82 0.000604 0.001314 0.085894 1.293407 0.000667 0.001485 0.005570 0.00	.67 0.001011 0.001195 0.0000813 0.000085 0.000080 0.000725 0.000068 0.000081 0.000041 0.000037 0.000039 0.000081	0.000036 0.063369 0.003538 0.000057 0.000043 0.000055 0.000120 0.000060 0.000061 0.000070 0.000060 0.000041 0.000059 0.000068 0.000647 0.010767 0.001141 0.000552 0.000528 0.001183 0.000620 0.000586 0.000597 0.000444 0.000719 0.000632 0.000806 0.000500	0.000011 0.000077 0.000541 0.000050 0.000055 0.000136 0.000 0.000099 0.000631 0.001287 0.000643 0.000921 0.001031 0.027	347 0.000119 0.000110 0.000103 0.000103 0.000112 0.000099 0.000087 0.000104 0.000110 0.00086 0.000609 0.000105 0.000110 0.000626 0.000161 0.000139 0.000135 0.0001894 0.001358 0.0001894 0.001358 0.000994 0.001894
MAINTENANCE & REPAIR 17 BUILDING CONSTRUCTION 18	0.016352 0.017984 0.017388 0.016657 0.016136 0.021128 0.025434 0.020318 0.017712 0.015584 0.035348 0.01377 0.000000 0.000000 0.000000 0.000000 0.000000	9 0.007803 0.016096 0.009766 0.009000 1.007802 0.009792 0.012888 0.00 0C 0.000000 0.000000 0.001013 0.000001 0.000001 1.007861 0.000067 0.0	02 0.016913 0.024788 0.013401 0.012353 0.016248 0.030479 0.014963 0.005916 0.005634 0.007381 0.007599	0.005938 0.029728 0.021118 0.011430 0.009184 0.012332 0.010197 0.017605 0.018468 0.035653 0.019916 0.008908 0.010405 0.008905	0.003254 0.037257 0.009538 0.006480 0.008292 0.046508 0.045	131 0.035207 0.036553 0.022273 0.020443 0.014731 0.017153 0.018364 0.019151 0.043273 0.018551 0.016978 0.014623 0.023533 0.019274 0.032301 0.032537 0.056445
HEAVY CONSTRUCTION 19	0.000133 0.000144 0.000142 0.000152 0.000154 0.000163 0.000179 0.000155 0.000139 0.000139 0.000198 0.0001	30 0.000106 0.000294 0.000244 0.000252 0.003590 0.006208 1.010974 0.00	0.000173 0.000162 0.000157 0.000171 0.000100 0.000179 0.000106 0.000138 0.000150 0.000146 0.000092	0.000055 0.000165 0.000259 0.000361 0.000087 0.000158 0.000235 0.000261 0.000270 0.000363 0.000183 0.000117 0.000124 0.000291	0.000037 0.000298 0.010452 0.000112 0.000154 0.000846 0.000	000 0.000000 0.000000 0.000000 0.000000 0.000000
SPECIAL TRADE CONSTRUCTION 20 MEAT PRODUCTS 21	0.017560 0.019319 0.018692 0.017988 0.017697 0.022579 0.026824 0.021571 0.018935 0.016807 0.036809 0.01491 0.014407 0.014696 0.014747 0.015338 0.016510 0.018370 0.014761 0.014680 0.013697 0.013926 0.012873 0.01153	4 0.009984 0.020854 0.008225 0.007667 0.008939 0.009604 0.013789 0.0	0.018213 0.026082 0.014666 0.013292 0.017072 0.031591 0.015760 0.006633 0.006217 0.008019 0.009979 0.018213 0.026082 0.010425 0.024857 0.010186 0.008613 0.009736 0.006599 0.006093 0.030798 0.007616	0.006466 0.032670 0.022274 0.012257 0.009834 0.013164 0.010980 0.018602 0.019397 0.036857 0.021253 0.009441 0.011536 0.009654 0.006035 0.009877 0.010999 0.008192 0.008822 0.008325 0.008332 0.009471 0.009130 0.007507 0.009628 0.007391 0.012319 0.007588	0.003442 0.038595 0.017667 0.007089 0.015484 0.048537 0.0479 0.001945 0.009241 0.012591 0.007895 0.008558 0.011839 0.013	950 0.037062 0.044147 0.035901 0.021862 0.022942 0.018948 0.019846 0.025761 0.044890 0.019699 0.018084 0.016193 0.028042 0.020500 0.037068 0.034306 0.058593
CAIRY PRODUCTS 22	0.007944 0.008102 0.008129 0.008457 0.009109 0.010158 0.007689 0.007964 0.007496 0.007517 0.007079 0.0062	0.005292 0.011331 0.004304 0.004184 0.004682 0.005158 0.007534 0.00	0.007501 1.034783 0.005219 0.008791 0.005635 0.004633 0.005374 0.003624 0.003096 0.003509 0.004096	0.003306 0.005417 0.006060 0.004529 0.004786 0.004592 0.004601 0.005235 0.005045 0.004143 0.005321 0.003868 0.006799 0.004148	0.001076 0.005024 0.006955 0.004348 0.004724 0.006525 0.007	269 0.009245 0.007081 0.008270 0.011233 0.009052 0.009926 0.036862 0.009871 0.008659 0.009534 0.015664 0.007156 0.010289 0.006311 0.016182 0.008604 0.014985
GRAIN MILL PRODUCTS 23 OTHER FCOD & KINDRED PRODUCTS 24	0.002269 0.002312 0.002321 0.003267 0.002593 0.003559 0.126188 0.217158 0.064727 0.222858 0.039934 J.0017 0.009760 0.009951 0.009984 0.010401 0.011176 0.012385 0.095432 0.028445 0.016796 0.031617 0.010446 0.0076	63 0.007186 0.014448 0.005439 0.005199 0.005733 0.006283 0.009212 0.0	33 0.017152 0.059296 0.057320 1.008029 C.006848 0.005670 0.006536 0.004458 0.003824 0.006595 0.005359	0.004035 0.006614 0.007399 0.005514 0.005838 0.00587 0.005601 0.006375 0.006147 0.005043 0.006478 0.004760 0.008259 0.005226	0.001307 0.006173 0.008435 0.005392 0.005763 0.007985 0.008	0.002548 0.002292 0.003133 0.002574 0.002810 0.008542 0.002649 0.002647 0.002647 0.002677 0.006844 0.002420 0.002929 0.001815 0.005051 0.002586 0.003344 924 0.016639 0.008843 0.009973 0.013645 0.011094 0.012167 0.040453 0.011274 0.010552 0.011621 0.023841 0.008903 0.012763 0.007768 0.011679 0.010810 0.014086
APPAREL 25 PAPER & ALLIED PRODUCTS 26	0.000542 0.000555 0.000556 0.000589 0.000626 0.000670 0.000797 0.001043 0.000660 0.001034 0.000570 0.0004	44 0.001187 0.007414 0.000422 0.000315 0.000439 0.000518 0.000572 0.00 77 0.003072 0.003877 0.007534 0.004660 0.001594 0.001642 0.002145 0.0	94 0.010816 0.025926 0.011394 0.002800 0.001520 1.031126 0.015881 0.000781 0.00177 0.027780 0.002545	0.000223 0.000396 0.000424 0.000295 0.000310 0.000439 0.000307 0.000349 0.000345 0.000282 0.000351 0.000260 0.000501 0.000315 0.000926 0.001453 0.001115 0.000742 0.002993 0.008840 0.000782 0.001065 0.000931 0.002343 0.001130 0.001075 0.001413 0.001578	0.000069 0.000338 0.000458 0.000312 0.000326 0.001627 0.000	567 0.000684 0.001281 0.000689 0.000786 0.000624 0.000873 0.000613 0.000643 0.000610 0.000672 0.001798 0.005046 0.002586 0.000581 0.001631 0.000620 0.001433
PRINTING & PUBLISHING 27	0.005715 0.005996 0.005973 0.005840 0.007153 0.006524 0.005668 0.005525 0.005522 0.005741 0.004874 0.0048	71 0.005589 0.009381 0.004185 0.004241 0.003531 0.004857 0.006209 0.00	0.006032 0.006360 0.006160 0.005349 0.003234 0.003051 1.023008 0.003325 0.002578 0.002393 0.004639	0.002331 0.005241 0.003821 0.002993 0.004098 0.006854 0.003279 0.004565 0.003583 0.002688 0.004367 0.002410 0.006728 0.003486	0.000623 0.003566 0.012734 0.004465 0.003939 0.018403 0.006	266 0.00986 0.028867 0.015643 0.010176 0.032033 0.009953 0.006698 0.030209 0.023506 0.022416 0.020624 0.006703 0.007902 0.037930 0.005841 0.018728 0.016727
AGRICULTURAL CHEMICALS 29	0.026107 0.028404 0.030099 0.059670 0.004093 0.007053 0.019392 0.039432 0.028782 0.028943 0.007353 0.1750 0.005061 0.003925 0.003777 0.010351 0.003686 0.002565 0.002075 0.001356 0.002033 0.002566 0.002217 0.0012	13 0.000659 0.001015 0.000294 0.000282 0.000285 0.000338 0.001673 0.0	185 0.001689 0.001316 0.003920 0.000987 0.000327 0.000286 0.000336 0.001141 1.011988 0.000245 0.000420	0.001876 0.000520 0.001467 0.000364 0.000424 0.000505 0.029000 0.000927 0.000407 0.000341 0.000430 0.000383 0.000665 0.000343 0.000201 0.000345 0.000364 0.000278 0.000283 0.000320 0.000306 0.000332 0.000299 0.000245 0.000315 0.000227 0.000420 0.000243	0.000086 0.000623 0.000640 0.000388 0.000405 0.000566 0.000 0.000062 0.000357 0.000424 0.000259 0.000291 0.000861 0.000	849 0.000857 0.000624 0.000685 0.001699 0.000734 0.000971 0.002004 0.000823 0.000696 0.000756 0.001194 0.000765 0.001688 0.000571 0.003324 0.000714 0.000935 0.000914 0.000914 0.002023 0.000648 0.000835 0.000549 0.00291 0.000760 0.000559 0.000572 0.000567 0.000584 0.001553 0.015304 0.004501 0.000930 0.000932 0.000802
OTHER CHEMICALS 30 PETROLEUM & COAL PRODUCTS 31	0.004199 0.004507 0.004583 0.005047 0.007677 0.004783 0.004783 0.007674 0.004783 0.004938 0.004938 0.004561 0.005464 0.004671 0.005371 0.0105 0.040615 0.052739 0.041887 0.075708 0.075708 0.070541 0.047129 0.029794 0.035791 0.031722 0.035479 0.027713 0.0322	01- 0.008227 0.010604 0.021180 0.007321 0.021989 0.013849 0.011359 0.07	89 0.004910 0.004282 0.004486 0.005967 0.002837 0.012704 0.003625 0.003036 0.022975 1.067351 0.004905 33 0.029735 0.026413 0.023190 0.022298 0.015048 0.013163 0.014934 0.026813 0.042866 0.010909 1.020645	0.004025 0.006345 0.003216 0.002265 0.010078 0.003139 0.002694 0.002712 0.002624 0.002640 0.002796 0.018911 0.004797 0.002666 0.010155 0.021408 0.016884 0.012518 0.013137 0.016346 0.013100 0.014461 0.013796 0.01353 0.016884 0.016889 0.019689 0.019689	0.003571 0.009279 0.003926 0.002111 0.002562 0.004249 0.0056	0.005270 0.004293 0.004345 0.005586 0.004516 0.005260 0.004247 0.004626 0.004891 0.004630 0.006199 0.007113 0.007820 0.009655 0.007511 0.006406 0.006089
RUBBER & PLASTICS 32	0.000683 0.000753 0.000713 0.001077 0.000965 0.000783 0.000616 0.000603 0.000583 0.000594 0.000536 0.0004	72 0.002295 0.002521 0.016011 0.082643 0.000326 0.004882 0.001852 0.00	0.000580 0.000513 0.000465 0.000394 0.000328 0.000396 0.000349 0.000398 0.000319 0.000283 0.001848	1.000255 0.002111 0.000476 0.000297 0.000307 0.001097 0.013961 0.000330 0.000330 0.000253 0.000340 0.000255 0.002247 0.000352	0.000062 0.000704 0.000508 0.003512 0.000351 0.001259 0.0020	0.000676 0.000604 0.000656 0.000690 0.000722 0.000837 0.000611 0.000618 0.000556 0.000583 0.002207 0.000665 0.000990 0.000525 0.000567 0.000613 0.000721
CEMENT & CONCRETE 33 OTHER STONE & CLAY 34	0.001027 0.001062 0.001052 0.001027 0.001123 0.001081 0.000971 0.000911 0.000871 0.000870 0.001022 0.0007 0.002289 0.002407 0.002363 0.002807 0.002815 0.002826 0.002228 0.002215 0.002116 0.002073 0.002230 0.0016	0.001931 0.003380 0.042306 0.002786 0.014771 0.017786 0.006824 0.0	71 0.002077 0.001940 0.001450 0.001331 0.001512 0.001493 0.001446 0.000956 0.000810 0.000927 0.001388	0.000363	0.000126 0.000885 0.001357 0.000633 0.000609 0.001254 0.0013 0.000290 0.001802 0.001908 0.001134 0.001357 0.002200 0.0035	335 0.001241 0.001171 0.001112 0.001209 0.001204 0.001158 0.000902 0.001211 0.001291 0.001069 0.010088 0.001044 0.001336 0.000917 0.001209 0.001735 0.001603 0.002650 0.002269 0.002300 0.003067 0.002447 0.002747 0.002477 0.002477 0.002618 0.002663 0.002663 0.002033 0.003262 0.001779 0.003165 0.002440 0.003318
PRIMARY METALS 35	0.000756 0.000850 0.000790 0.001269 0.001126 0.000738 0.000700 0.000576 0.000588 0.000581 0.000670 0.0003 0.000795 0.000844 0.000825 0.000794 0.000840 0.000832 0.000896 0.000759 0.000704 0.000677 0.001080 0.0005	70 0.001575 0.001828 0.004180 0.004237 0.008107 0.005615 0.006006 0.00	07 0.000564 0.000573 0.000446 0.000409 0.000306 0.000427 0.000320 0.000281 0.000233 0.000210 0.000983	0.000195 0.000697 0.000427 1.031206 0.002424 0.001329 0.026003 0.005626 0.002867 0.000461 0.002706 0.021460 0.001480 0.012964	0.006089 0.000486 0.000519 0.000337 0.004290 0.002458 0.0020	0.000691 0.000748 0.000677 0.000561 0.000666 0.000654 0.000487 0.000607 0.000706 0.000543 0.005716 0.000711 0.001294 0.000689 0.000617 0.000918 0.000880
OTHER FABRICATED METAL PRODUCTS 37	0.001245 0.001592 0.001668 0.001944 0.001430 0.001596 0.001848 0.001292 0.001324 0.001633 0.001594 0.0097	91 0.006551 0.006412 0.003325 0.007933 0.021324 0.018548 0.002993 0.0/	0.001287 0.001505 0.001025 0.000778 0.001196 0.001814 0.000733 0.000793 0.000576 0.000521 0.00618	0.000707 0.001549 0.008977 0.001236 0.000543 1.002771 0.001011 0.021728 0.013998 0.002122 0.001367 0.000592 0.002077 0.043322	0.000144 0.010465 0.000891 0.000577 0.004608 0.001796 0.0060	0.001187 0.001306 0.001139 0.000868 0.000962 0.000853 0.000722 0.00109 0.001352 0.000802 0.007734 0.000835 0.001105 0.000810 0.001171 0.001564 0.001712 0.001813 0.00281 0.00281 0.002495 0.004060 0.002133 0.001527 0.001414 0.001204 0.001355 0.001641 0.001031 0.001893 0.001284 0.001574 0.000974 0.000974 0.001426 0.002108 0.002116
FARM MACHINERY 38 CONSTRUCTION MACHINERY 39	0.010808 0.013627 0.011506 0.029682 0.023398 0.010301 0.008724 0.006187 0.007488 0.007188 0.006209 0.00077 0.000544 0.000551 0.000546 0.000504 0.000590 0.000389 0.000382 0.000332 0.000348 0.000383 0.000287 0.000287 0.000389 0.000389 0.000382 0.000382 0.000388 0.000383 0.000287 0.000389 0.000389 0.000382 0.000382 0.000388 0.000383 0.000287 0.000389 0.000382 0.000382 0.000388 0.000388 0.000287 0.000389 0.000382 0.000382 0.000388 0.000388 0.000287 0.000382 0.000382 0.000382 0.000388 0.000388 0.000287 0.000382 0.0000382 0.00000000000000000000000000000000000	269 0.002001 0.002056 0.000684 0.000521 0.000247 0.000674 0.002247 0.0	002 0.005615 0.005126 0.004616 0.004404 0.000584 0.000489 0.000591 0.000403 0.000365 0.000507 0.000448 047 0.000412 0.000312 0.000312 0.000308 0.000256 0.000212 0.000226 0.000212 0.000261 0.000155 0.000162 0.00174	0.000354 0.000599 0.000668 0.000527 0.000501 0.000506 1.000514 0.000617 0.000562 0.000475 0.000569 0.000415 0.000723 0.000474 0.000156 0.000282 0.000309 0.000196 0.000339 0.000183 0.000194 1.000228 0.000228 0.000176 0.000230 0.000197 0.000264 0.000604	0.000114 0.000693 0.002735 0.000472 0.000954 0.001469 0.0000 0.000038 0.000205 0.000283 0.000431 0.000736 0.000398 0.0004	0.001589 0.001253 0.001128 0.001320 0.001045 0.003531 0.001559 0.001124 0.000934 0.001008 0.001405 0.002553 0.025666 0.000849 0.001679 0.000883 0.001405
FCOD PRODUCTS MACHINERY 40	0.000571 0.000603 0.000578 0.000625 0.000674 0.000460 0.000401 0.000389 0.000390 0.000428 0.000326 0.000330 0.000484 0.000539 0.000539 0.000508 0.000628 0.000590 0.000587 0.000559 0.000510 0.000480 0.000457 0.000635 0.00063	54 0.005854 0.005582 0.001033 0.000522 0.000252 0.000292 0.000578 0.00	92 0.000461 0.000351 0.000338 0.000294 0.000224 0.000247 0.002512 0.000499 0.000242 0.000184 0.003007 48 0.000473 0.000576 0.000369 0.000363 0.000347 0.000347 0.000356 0.000568 0.000356 0.000356 0.000358	0.000188 0.000362 0.000624 0.000234 0.000214 0.000230 0.000234 0.000256 1.000253 0.000204 0.000251 0.000207 0.000276 0.000559	0.000043 0.000233 0.001415 0.000436 0.000592 0.000496 0.000	0.000529 0.000482 0.000473 0.000511 0.000693 0.000619 0.000377 0.000635 0.000463 0.000508 0.010007 0.000635 0.000625 0.000527 0.000425 0.001073 0.000508
ELECTRICAL MACHINERY 41 OTHER MACHINERY 42	0.001238 0.001357 0.001280 0.001894 0.001755 0.001124 0.000999 0.000885 0.000926 0.000963 0.000890 0.0007	47 0.004165 0.004326 0.002437 0.004860 0.001169 0.001415 0.001358 0.00	69 0.000955 0.000826 0.000772 0.000733 0.000743 0.000524 0.001466 0.000764 0.000795 0.001929 0.002317	0.002864 0.000706 0.000673 0.000559 0.023176 0.003501 0.032474 0.083150 0.000715 0.001243 1.000780 0.000510 0.019932 0.002134	0.000084 0.000593 0.003673 0.000771 0.002754 0.014790 0.001	0.000796 0.000910 0.001916 0.001342 0.000704 0.000685 0.000526 0.000623 0.000789 0.000560 0.000863 0.000593 0.000606 0.000817 0.000738 0.000985 0.000985 0.000985 0.000985 0.0001231 0.001231 0.001575 0.001546 0.001164 0.001278 0.001310 0.000874 0.001117 0.001208 0.001323 0.013359 0.001521 0.001960 0.002923 0.000860 0.001692 0.001278
MOTOR VEHICLES 43 AEROSPACE 44	0.000046 0.000051 0.000048 0.000076 0.000069 0.000050 0.000041 0.000037 0.000040 0.000038 0.000035 0.00000 0.000257 0.000263 0.000264 0.000280 0.000288 0.000298 0.000240 0.000258 0.000244 0.000242 0.000232 0.0002	24 0.000035 0.000054 0.000642 0.000020 0.000017 0.000022 0.000058 0.00 217 0.000157 0.000355 0.000402 0.002019 0.000180 0.000194 0.000258 0.00	80 0.000242 0.000210 0.000163 0.000149 0.00018 0.000151 0.000180 0.000118 0.000103 0.000122 0.000142	0-000012 0-000058 0-000024 0-000015 0-000016 0-000017 0-001544 0-000018 0-000017 0-000014 0-000018 1-000014 0-000023 0-012958 0-000207 0-000199 0-000208 0-000149 0-000273 0-001428 0-000318 0-000627 0-000182 0-000141 0-005384 0-000126 1-006391 0-000189	0.00003 0.000018 0.000026 0.000019 0.000018 0.000025 0.0000 0.000035 0.000177 0.000243 0.000138 0.000170 0.000284 0.0002	0.000033 0.000026 0.000027 0.000123 0.000033 0.000046 0.000030 0.000037 0.000032 0.000161 0.000033 0.000075 0.000024 0.000032 0.000037 0.000038 0.000038 0.000038 0.000037 0.000038 0.0000038 0.0000000000
TRAILER COACHES 45	0.001219 0.001240 0.001239 0.001236 0.001370 0.001308 0.001009 0.001039 0.001011 0.001036 0.000923 0.0008	31 0.002148 0.002780 0.000954 0.000810 0.000645 0.000704 0.001070 0.00	45 0.001063 0.000880 0.000737 0.000653 0.000722 0.000633 0.000696 0.000566 0.000428 0.000473 0.001269	0.000449 0.000753 0.000843 0.000601 0.000628 0.000597 0.000607 0.000696 0.000678 0.000546 0.000706 0.000538 0.000861 1.000893	0.000136 0.000657 0.000892 0.000773 0.000653 0.000956 0.0016	0.001230 0.000973 0.001038 0.001452 0.001360 0.001425 0.001055 0.001348 0.001174 0.001303 0.011302 0.001216 0.001516 0.000984 0.001201 0.001791 0.001428
OTHER TRANSPORTATION EQUIPMENT 46 OTHER MANUFACTURING 47	0.000247 0.000256 0.000257 0.000280 0.000293 0.000315 0.000245 0.000256 0.000239 0.000243 0.000232 0.00023 0.000230 0.0002010 0.002146 0.002181 0.002300 0.002279 0.002471 0.002242 0.002017 0.002086 0.002132 0.001963 0.0051	54 0.004601 0.005682 0.004266 0.006673 0.009677 0.008222 0.006555 0.01	77 0.002141 0.001917 0.001851 0.001342 0.003393 0.C01349 0.001301 0.001160 0.000870 0.000895 0.002997	0.000997 0.001762 0.001824 0.001158 0.001081 0.001719 0.001888 0.001689 0.001378 0.001127 0.001261 0.000865 0.003739 0.012231	0.000240 1.004600 0.001543 0.001649 0.009565 0.004307 0.0029	0.000474 0.000351 0.000407 0.000386 0.000540 0.000328 0.000272 0.000342 0.000289 0.000313 0.000266 0.000273 0.000327 0.000325 0.000274 0.000253 0.000359 0.000359 0.000347 0.006347 0.006744 0.008234 0.007140 0.003525 0.002830 0.002338 0.003250 0.013187 0.003284 0.004104 0.002081 0.002431 0.001974 0.005795 0.005576 0.009217
RAILROAD TRANSPORTATION 48 MCTOR FREIGHT 49	0.007246 0.007810 0.007818 0.008998 0.009344 0.008588 0.008658 0.008059 0.007386 0.008125 0.007159 0.00759 0.009667 0.012141 0.010500 0.017717 0.010585 0.011710 0.008011 0.010385 0.009456 0.010169 0.008919 0.0124	16 0.006762 0.022387 0.011307 0.010084 0.004646 0.010247 0.016401 0.00 498 0.009532 0.029976 0.011636 0.006219 0.003275 0.009247 0.014417 0.0	.46 0.011023 0.007255 0.010706 0.013141 0.004119 0.007075 0.005148 0.011511 0.012888 0.011874 0.005751 .75 0.015206 0.007996 0.011596 0.009262 0.003360 0.032014 0.010492 0.015514 0.016849 0.015797 0.019033	0.003322 0.005256 0.018313 0.031942 0.005300 0.011312 0.019788 0.019697 0.020329 0.023690 0.010985 0.008475 0.008423 0.025810 0.002349 0.021138 0.014616 0.009713 0.010640 0.015421 0.003803 0.003497 0.005348 0.002666 0.003419 0.002217 0.003318 0.005933	0.002507 0.016577 1.041747 0.008729 0.010052 0.068021 0.0482 0.001194 0.007692 0.010498 1.005988 0.005175 0.013084 0.0119	238 0.033094 0.020394 0.026897 0.014355 0.045136 0.010220 0.009227 0.016686 0.008243 0.008483 0.007962 0.011179 0.010065 0.013747 0.007542 0.006964 0.010466
OTHER TRANSPORTATION 50	0.002950 0.003226 0.003036 0.003764 0.003802 0.003746 0.002673 0.002917 0.002717 0.002748 0.002649 0.0024	12 0.003015 0.004960 0.001993 0.001729 0.006091 0.003595 0.004127 0.00	0.002681 0.002384 0.001866 0.001729 0.001993 0.001900 0.001889 0.001614 0.001743 0.001273 0.018861	0.001111 0.002057 0.002137 0.001748 0.001612 0.001664 0.001625 0.001825 0.001907 0.001610 0.001825 0.001286 0.002544 0.001333	0.000365 0.002009 0.003029 0.004496 1.066893 0.002503 0.0029	998 0.003650 0.002898 0.003181 0.003880 0.003195 0.003848 0.002733 0.003130 0.003009 0.003139 0.003033 0.007407 0.004224 0.003939 0.003040 0.002804 0.003771
COMMUNICATIONS 51 ELECTRIC GAS & SANITARY SERVICES 52	0.013746 0.014163 0.014407 0.016570 0.015418 0.016639 0.014856 0.015108 0.014462 0.014940 0.019671 0.0207 0.035588 0.035197 0.039648 0.057492 0.043965 0.049365 0.047147 0.038440 0.034517 0.033295 0.032922 0.0365	517 0.018682 0.043971 0.059430 0.050661 0.017766 0.024515 0.031801 0.0	766 0.033791 0.044021 0.027629 0.029122 0.019922 0.027529 0.021324 0.017916 0.019222 0.026230 0.035989	0.012490 0.012898 0.012490 0.009700 0.010254 0.020574 0.013868 0.012795 0.022644 0.017457 0.013637 0.014180 0.015305 0.017396 0.025572 0.021780 0.031428 0.019304 0.018380 0.047934 0.022263 0.020032 0.021013 0.014834 0.026440 0.024514 0.028489 0.017375	0.001580 0.014520 0.016286 0.015128 0.020362 1.077709 0.0183 0.003215 0.022148 0.027020 0.018382 0.034516 0.037226 1.2616	221 0.036443 0.071254 0.067916 0.035182 0.025961 0.032231 0.024407 0.021729 0.044409 0.050396 0.031104 0.043465 0.023602 0.141237 0.017480 0.020965 0.041800 0.020969 0.065320 0.054149 0.044553 0.045626 0.046289 0.059472 0.064447 0.045884 0.042841 0.034937 0.033256 0.107105 0.050206 0.030757 0.037382 0.034973 0.074558
GROCERIES 53 FARM PRODUCTS 54	0.003518 0.003495 0.003659 0.003760 0.004032 0.004474 0.005294 0.005160 0.004187 0.005143 0.003458 0.0031 0.005677 0.002364 0.007445 0.005104 0.005471 0.008463 0.015511 0.016926 0.018359 0.018918 0.008439 0.0154	59 0.002695 0.005131 0.002577 0.002458 0.001978 0.002259 0.003804 0.00 497 0.001267 0.002423 0.001395 0.001287 0.000941 0.001079 0.001640 0.0	78 0.005600 0.004043 0.010340 0.014330 0.002289 0.001961 0.002242 0.001543 0.001333 0.001560 0.002003 41 0.023067 0.009202 0.063303 0.011640 0.001065 0.000977 0.001049 0.000755 0.000688 0.001308 0.001568	0.001397 0.002354 0.002526 0.001865 0.001981 0.001960 0.001904 0.002208 0.002084 0.001705 0.002194 0.001607 0.002796 0.001781	0.000436 0.002088 0.003234 0.001880 0.002251 0.003989 0.0054	1.006023 0.038656 0.004432 0.005463 0.004463 0.009632 0.037549 0.026856 0.003663 0.004041 0.007965 0.005267 0.032552 0.002999 0.008419 0.003815 0.006488
MACHINERY & EQUIPMENT 55	0.007733 0.009441 0.008773 0.009882 0.012704 0.007577 0.008243 0.006557 0.007003 0.008654 0.006781 0.0124	.75 0.014372 0.043937 0.026826 0.031171 0.005410 0.007189 0.018250 0.00	0.013037 0.014051 0.012536 0.011856 0.007118 0.010220 0.007167 0.008310 0.008075 0.012070 0.015917	0-011850 0-011509 0-007603 0-004898 0-007638 0-005365 0-008198 0-008816 0-005598 0-003887 0-009008 0-001986 0-016682 0-009135	0.002632 0.010577 0.003412 0.006598 0.002572 0.004367 0.005	0.008492 0.014661 1.008687 0.006962 0.140960 0.009229 0.019699 0.015033 0.007805 0.004406 0.005027 0.031540 0.008002 0.020520 0.010426 0.008608 0.009621
OTHER WHOLESALE TRADE 56 FARM EQUIPMENT DEALERS 57	0.031946 0.031806 0.030186 0.024613 0.027678 0.036877 0.044910 0.028038 0.053649 0.032197 0.037052 0.0313 0.025102 0.035864 0.031418 0.018464 0.055012 0.018473 0.019935 0.009303 0.017422 0.020830 0.014860 0.01486	812 0.000285 0.000604 0.000232 0.000222 0.000257 0.000278 0.000401 0.0	57 0.013176 0.011245 0.011835 0.009779 0.00299 0.000248 0.000284 0.000192 0.000170 0.00523 0.000219	0.000176 0.000287 0.000321 0.000239 0.00025 0.000243 0.000244 0.000277 0.000267 0.000219 0.000210 0.000310 0.000320 0.000320 0.000224	0.001182 0.010665 0.007823 0.023745 0.005272 0.008597 0.0102 0.000057 0.000640 0.000367 0.000230 0.000253 0.000346 0.0003	275 0.013498 0.013847 0.012767 1.013043 0.010895 0.086483 0.023425 0.088278 0.008426 0.008892 0.010242 0.011969 0.016774 0.013536 0.014148 0.012252 0.016491 0.000540 0.000383 0.000431 0.000594 1.000478 0.000525 0.001586 0.000493 0.000462 0.000504 0.000851 0.000441 0.000546 0.000335 0.000888 0.000888 0.000888 0.0008892 0.0008892 0.010242 0.011969 0.016774 0.013536 0.014148 0.012252 0.016491
GASCLINE SERVICE STATIONS 58	0.012018 0.015095 0.012386 0.020603 0.019886 0.014305 0.009267 0.010773 0.009749 0.010633 0.008765 0.0089	51 0.005753 0.011446 0.007305 0.007017 0.008044 0.007209 0.009902 0.00	0.009226 0.007411 0.006959 0.006954 0.005334 0.004481 0.005371 0.003474 0.003022 0.003783 0.004762 0.019159 0.018155 0.013146 0.012034 0.014242 0.012737 0.013837 0.009287 0.007999 0.009084 0.010702	0.003179 0.009603 0.007826 0.004573 0.005003 0.004431 0.004798 0.009293 0.004719 0.003961 0.005184 0.003566 0.006297 0.003865	0.001006 0.004874 0.008872 0.007681 0.006230 0.006726 0.0071	168 0.015277 0.011129 0.011852 0.012679 0.012180 1.010700 0.008270 0.011954 0.008092 0.008689 0.012219 0.010036 0.021859 0.011953 0.009409 0.008583 0.010286
EATING & DRINKING 59 OTHER RETAIL TRADE 60	0.019880 0.020316 0.020378 0.021320 0.022933 0.025748 0.018715 0.020023 0.019076 0.018867 0.018131 0.0162 0.050411 0.051485 0.051641 0.054073 0.058053 0.065703 0.047131 0.050875 0.048107 0.047634 0.045746 0.0405	1585 0.032207 0.071254 0.042034 0.040941 0.030261 0.033764 0.053616 0.03	0.010702 0.047807 0.041280 0.031924 0.029391 0.036333 0.029951 0.034649 0.023195 0.019972 0.022455 0.025519	0.015391 0.015391 0.011416 0.012999 0.011738 0.011697 0.013287 0.012748 0.010449 0.013495 0.009648 0.017670 0.010030 0.021181 0.035548 0.038833 0.029122 0.030608 0.029644 0.029616 0.033690 0.032422 0.026683 0.034203 0.024758 0.043809 0.024846	0.002755 0.012856 0.017619 0.011534 0.011959 0.017309 0.0195 0.006941 0.032365 0.045174 0.026916 0.031022 0.043990 0.0476	350 0.026463 0.023259 0.046881 0.033312 0.02625 0.025288 1.020800 0.023877 0.023763 0.026207 0.023403 0.019601 0.026058 0.017898 0.022543 0.020606 0.027396 671 0.067900 0.044963 0.048323 0.075689 0.059664 0.065306 0.058109 1.060787 0.055341 0.063006 0.052612 0.044655 0.066764 0.041344 0.061459 0.059699 0.075317
EANKING 61 OTHER FINANCE 62	0.017795 0.015534 0.015242 0.016363 0.019450 0.019564 0.015783 0.015224 0.015686 0.014435 0.011623 0.0138 0.034518 0.034895 0.034983 0.036388 0.039529 0.044052 0.031771 0.034001 0.032353 0.031951 0.030439 0.0271	894 0.013493 0.021851 0.013310 0.014050 0.011025 0.011599 0.015467 0.01 121 0.020749 0.046708 0.017063 0.016727 0.021007 0.022408 0.033649 0.02		0.018438 0.013261 0.011903 0.008739 0.008041 0.011610 0.008277 0.012460 0.025029 0.006107 0.008551 0.008937 0.011107 0.007849 0.014209 0.022967 0.025923 0.019421 0.020354 0.019689 0.019705 0.022493 0.021737 0.017779 0.022840 0.016545 0.029116 0.017371	0.001527 0.009417 0.010777 0.013975 0.019579 0.014870 0.0110 0.004606 0.021543 0.031260 0.018379 0.022809 0.027918 0.0309	308 0.019455 0.026079 0.027230 0.024393 0.021412 0.018610 0.013381 0.020088 1.021668 0.055121 0.015640 0.021391 0.016089 0.018865 0.017354 0.019064 0.015459 0.047811 0.030198 0.032308 0.047541 0.040688 0.042984 0.035544 0.041030 0.045172 1.040885 0.056938 0.030358 0.044086 0.026719 0.040947 0.046231 0.046513
INSURANCE & REAL ESTATE 63	0.047485 0.048119 0.047693 0.043924 0.051534 0.033907 0.031527 0.028908 0.030357 0.033434 0.024993 0.0234 0.002725 0.002805 0.002793 0.002913 0.003187 0.003254 0.002642 0.002620 0.002657 0.002606 0.002381 0.0023	71 0.175141 0.179819 0.059709 0.045494 0.020553 0.022317 0.037156 0.07	0.035935 0.027203 0.026839 0.022303 0.018453 0.019684 0.018448 0.022788 0.013514 0.014118 0.093323	0.013647 0.024618 0.026956 0.017022 0.017525 0.015939 0.016911 0.019809 0.019860 0.015204 0.020025 0.017173 0.021315 0.052245	0.003337 0.017853 0.022996 0.037507 0.020654 0.034612 0.041	846 0.036490 0.031926 0.033163 0.039726 0.052316 0.048935 0.029565 0.050097 0.035857 0.040607 1.042646 0.056023 0.054878 0.040082 0.035902 0.101692 0.039537
LODGING SERVICES 64 PERSONAL SERVICES 65	0.002725 0.002805 0.002793 0.002913 0.003187 0.003254 0.002620 0.002620 0.002657 0.002606 0.002381 0.00281 0.00281 0.00281 0.00281 0.00281 0.00281 0.00281 0.00281 0.00281 0.00281 0.00281 0.002	647 0.015924 0.036347 0.014295 0.014184 0.015926 0.018650 0.040130 0.0	0.003449 0.001175 0.001344 0.003449 0.001175 0.001344 0.003449 0.001175 0.001344 0.003449 0.002345 0.011105 0.011856 0.012928	0.001277 0.003006 0.001426 0.001429 0.001701 0.002119 0.002030 0.001773 0.001658 0.001293 0.001919 0.001168 0.002721 0.001635 0.011370 0.019374 0.020618 0.015161 0.015946 0.015894 0.015522 0.019181 0.017036 0.014008 0.017844 0.012889 0.023141 0.013204	0.00367 0.001747 0.002313 0.001852 0.001623 0.002122 0.002 0.003575 0.017032 0.023552 0.014536 0.016061 0.048970 0.024	0.006024 0.007715 0.027561 0.008366 0.006237 0.003600 0.004379 0.004300 0.005942 0.007606 0.009415 1.003897 0.003599 0.004217 0.003832 0.003128 0.004346 0.053612 0.043366 0.036957 0.043296 0.031178 0.134989 0.037695 0.036475 0.036047 0.03052 0.032354 0.029355 0.096013 1.040533 0.027974 0.055322 0.027173 0.046392
BUSINESS SERVICES 66 MEDICAL & HEALTH SERVICES 67	0.004253 0.004279 0.004421 0.004320 0.004531 0.004924 0.005509 0.005024 0.005734 0.005474 0.004704 0.0058 0.034474 0.035172 0.035307 0.036921 0.039613 0.044876 0.032162 0.034766 0.032793 0.032520 0.031234 0.0276	814 0.008742 0.019322 0.003706 0.009127 0.001872 0.003522 0.023319 0.00 655 0.019318 0.046491 0.017848 0.017712 0.023262 0.026124 0.032646 0.02	772 0.005725 0.006923 0.004515 0.005183 0.001604 0.004715 0.002687 0.001946 0.006200 0.001860 0.005682 662 0.032630 0.028217 0.021763 0.019958 0.024913 0.020282 0.023718 0.015744 0.013628 0.015387 0.016037	0.001444 0.002805 0.002659 0.004861 0.002432 0.003579 0.003895 0.001792 0.001923 0.001373 0.002569 0.001414 0.003352 0.003721 0.014508 0.023815 0.026627 0.020028 0.020979 0.020334 0.020321 0.023113 0.022270 0.018397 0.023563 0.016996 0.030071 0.017608	0.000290 0.005089 0.002671 0.001807 0.003874 0.023306 0.017	798 0.011740 0.017390 0.009927 0.007167 0.004320 0.005542 0.005640 0.009256 0.015789 0.004008 0.010750 0.021714 0.005541 1.058177 0.003670 0.019230 0.007063
OTHER SERVICES 68	0.007103 0.007672 0.007406 0.007870 0.009255 0.008159 0.007049 0.006647 0.006809 0.006902 0.006165 0.0059		43 0.008423 0.006989 0.006602 0.008219 0.004213 0.004670 0.008020 0.003427 0.002971 0.003862 0.007505 167 0.003776 0.003285 0.002536 0.002316 0.002838 0.002354 0.002711 0.001836 0.001565 0.001768 0.002142	20000	0.000762 0.005216 0.005586 0.009517 0.025229 0.017856 0.007	0.040342 0.030535 0.033209 0.048955 0.038942 0.043666 0.046870 0.045876 0.037899 0.041607 0.040095 0.030506 0.044834 0.027224 1.062918 0.035928 0.048925 732 0.013838 0.028972 0.032416 0.018141 0.037585 0.075149 0.009483 0.013692 0.025965 0.022569 0.021134 0.026900 0.014876 0.015593 0.012958 1.027607 0.013736
EDUCATION 69			0.002848 0.002711 0.001836 0.001769 0.002848 0.002711 0.001836 0.001865 0.001769 0.002162	0-001669 0-002766 0.003057 0.002282 0.002422 0.002375 0.002319 0.002641 0.002544 0.002087 0.002682 0.001949 0.003481 0.002104	AND DESCRIPTION OF THE PROPERTY OF THE PROPERT	701 0.004789 0.003642 0.004477 0.005841 0.004649 0.005039 0.029368 0.016162 0.004389 0.004858 0.008165 0.003642 0.005209 0.003233 0.005354 0.004442 1.026675