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RECREATION and the LOCAL ECONOMY

An Input-Output Model
of a Recreation-Oriented Economy

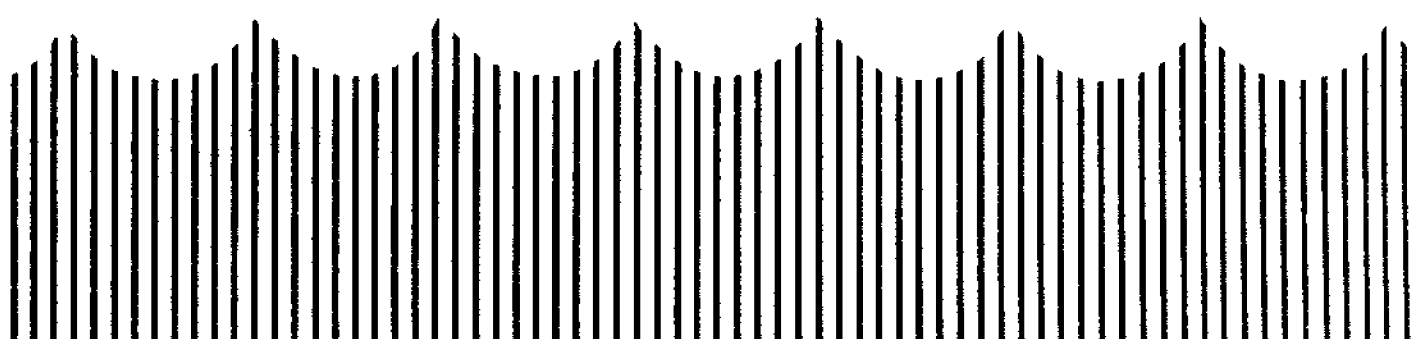
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RECREATION AND THE LOCAL ECONOMY
AN INPUT-OUTPUT MODEL OF
A RECREATION-ORIENTED ECONOMY

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UNIVERSITY OF WISCONSIN-MADISON

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PREFACE

Historically, studies of our environment have been conducted primarily by researchers in the physical sciences. The output of this research often proved useless to policy-makers, who were unable to understand the technical language used and who proved incapable of relating results to other facets of the environment. Ecologists established interrelationships in the environment, and broadened the scope of the research that was being accomplished. However, generally having natural science backgrounds, they were unable to fully develop the economic and social consequences of their findings. As a result, such diverse groups as economists, sociologists, engineers, and lawyers were brought together as members of interdisciplinary teams to study the environment and its relationships to society.

This project was borne out of a desire to broaden the scope of a marine research program being conducted in Green Bay, a major bay of Lake Michigan. Although not directly related to the other studies, the input-output model to be developed had potential use in tracing the economic impacts of results from the other studies.

Specifically, this report presents the findings of the first stage of a three-stage project to relate water quality to the economic health of an area oriented toward outdoor recreation. The three project stages are:

1. Identify the economic interactions in the area and trace the total impact of tourism on the economy.
2. Measure the direct and indirect economic impacts of specific groups of tourists on the local economy.
3. Relate the several dimensions of the quality of local water resources to the number of tourists drawn to the area in these specific groups.

Assuming that all three stages of the research are successfully accomplished, it is then possible to relate water quality to an important segment of the local economy.

The mathematics of input-output analysis, the mechanism used to define the structure of the local economy in this study, are well developed and are not detailed in this report. The adaptations of the traditional static input-output

model made to meet the specific objectives of this study are fully explained. The language and style of this report is intended to be as simple and direct as possible to promote understanding, interest, and hopefully, at the appropriate moment, action on the part of those who establish water quality management policy.

William A. Strang

ACKNOWLEDGEMENTS

The collection of the data necessary to build an input-output model is a formidable task. This project could not have been completed in the fourteen months that it took without the counsel and responsible efforts of my research assistants, Mr. William Murphy and Mr. Nitin Mehta.

This research was supported in part by the National Science Foundation and the State of Wisconsin under the University of Wisconsin Sea Grant Program.

I also want to recognize the cooperation and encouragement received from Mr. Tom Rulland and Mr. Vic Arnold, who acted as my primary contact within the Sea Grant Program. Finally, it is right that I recognize the important role that Floyd Harmston and Richard Lund's book, Application of an Input-Output Framework to a Community Economic System, played in helping me to understand input-output analysis as it pertains to a local economy.

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SECTION 1

BACKGROUND

RECREATION AND THE LOCAL ECONOMY

AN INPUT-OUTPUT MODEL OF A RECREATION-ORIENTED ECONOMY

In an amazingly short period of time, the Environment has arisen from an apparently passive position in the minds of most Americans to become a political, social, and economic issue of the utmost importance. Initially, it seemed that this was an issue that might close the generation gap and bring the nation together with a common purpose. While this may eventually occur, important conflicts, which have existed for many years, have also surfaced. Many of these are based on substantial disagreements about goals and priorities among two major groups -- conservationists and the proponents of economic development.

Historically, support for the conservationist group has come principally from white, middle-class Americans who have a natural interest and love of the outdoors. Their main goal has been the preservation and extension of our undeveloped lands and waters in their natural state for outdoor recreation uses. State conservation departments have been a center for their political activity.

The developers, on the other hand, are primarily motivated by the short and medium-term economic gain to be made through the utilization of our resources. Frequently, this gain is viewed in terms of personal profit, but it is also often related to the economic health of a community or area. Developer strength comes primarily from two disparate sources: powerful industrial interests and the economically disadvantaged, who view the environmental crisis as having a lower priority than their own immediate economic problems.

Industrial interests, with economic power and organization, together with politicians preoccupied with economic growth have generally swung the tide of battle toward the side of the developers. In many instances, we have used our resources badly and environmental crises seem to be arising faster than we can count them. In the past year, however, as the Environment has become a major concern to the general public, the balance of power seems to be dramatically shifting.

Resource managers are in an uncomfortable position, receiving pressures from both sides. And in many cases, the arguments of both groups are valid. It is legitimate to consider the economic interest of communities to be affected by resource management decisions. It is justifiable to recognize the needs and desires of our citizens for outdoor recreation.

As their science develops, the ecologists may provide resource managers with the most useful guidance, because they are primarily interested in the capacity of the environmental system to maintain itself, a perspective that is concerned with our long-run economic interests as well as the preservation of our resources. Unfortunately, even if goals were clearly defined, the resource managers would continue to have difficulty in their decision making, because they lack information as to what the impacts of their decisions would be. They have a strong need for data that will allow them to evaluate the long and short-run physical, economic, and social costs and benefits involved in their decisions. This study is designed to provide them with a part of their data needs, that part related to the short-run economic impact of recreation on an area.

RESEARCH OBJECTIVES

Recreation, man's refreshment of energies after toil, is a necessary element in the lives of all persons. Its distinguishing feature is that it is done for pleasure and not out of obligation. Outdoor recreation, leisure-time activities which utilize an outdoor setting, is highly dependent on the character of the natural resources available. It is also a major industry in this country. Unlike many industries, its short-run economic interests often call for the preservation rather than exploitation of natural resources. In many areas, where industrialization and agriculture are impractical because of location or the natural resource base, outdoor recreation offers the principal opportunities for economic activity. In these areas, resource management must concern itself with impacts on the recreation industry. Kneese has pointed out, for example, that "... producing or maintaining high quality water in many areas can be justified, if justified at all, only on the basis of the recreation benefits it yields. If we are to introduce a rational weighing of costs and benefits in the huge water quality management programs that are in prospect, it will be necessary to discover ways of establishing a functional relationship between the value of recreation and water quality."¹ This research is designed to partially satisfy the need that Kneese has defined. Its objective is:

To measure the positive economic impact of the outdoor recreation industry through tourism on

¹Allen V. Kneese, "Economic and Related Problems in Contemporary Water Resources Management," reprinted from Natural Resources Journal, October, 1965 by Resources for the Future, Inc., Washington, D.C., Reprint Number 55, Nov., 1965, p. 7.

on an area dependent on its water resources as a major attraction.

We recognize that the study does not provide all the information needed by resource managers. It does not measure the economic costs of the local outdoor recreation industry; it does not measure the social benefits and costs of the industry; it does not concern itself with the physical effects of the industry on the environment. Nevertheless, we feel that it offers important information to those responsible for resource policy, because economic impact on an area is one legitimate consideration in the establishment of that policy.

REGIONAL ECONOMIC CONCEPTS

Community economic systems are composed of microunits, consisting of people, businesses, and governmental units, who act as consumers and producers. Community economic activity involves exchanges among the local microunits and between the local units and units outside the community (imports and exports). The character of economic activity within the community is generally dependent on comparative advantages due to location, natural resources, human resources, or some other factor. Thus, basic industries, such as agriculture, manufacturing, mining, and fishing often vary substantially from community to community. Supporting activities, such as retailing, wholesaling, and personal services, tend to depend more on community size than its qualitative characteristics.

Because the economic microunits tend to specialize in their output, they find it necessary to make economic exchanges with other units. These economic interrelationships result in a highly complex community economic system. Fully understanding the impact of an industry, such as tourism, on an area requires recognition of these interrelationships.

For economic base analysis, it is assumed that inputs must equal outputs for each microunit. No allowance is made for inventory changes and savings are considered later (Schedule 1). The assumption for microunits leads to the corollary assumption that total input for the community economic system equals total output.

Economic units within the community produce for the local market and the export market. An independent increase or decrease in the local market is not possible, because this market is determined by local input requirements assumed to be a constant proportion of total output. In actuality, changes in population, productivity, the natural resource base, or

<u>Schedule 1</u>			
INPUTS AND OUTPUTS OF A RESTAURANT BUSINESS			
Inputs (payments)		Outputs (receipts)	
Wages to residents	\$ 5,000	Sales to residents	\$ 5,000
Local wholesalers	2,000	Sales to tourists	10,000
Local farmers	500		
Local utilities	500		
Imports	6,000		
Profit to resident	1,000		
	<u>\$15,000</u>		<u>\$15,000</u>

local savings-investment patterns may affect the local market.² But these changes tend to be infrequent or small. Major changes in the local economic system come primarily from alterations in the pattern of imports and exports. Exports represent new dollars coming into the community and imports represent leakages of dollars from the community.

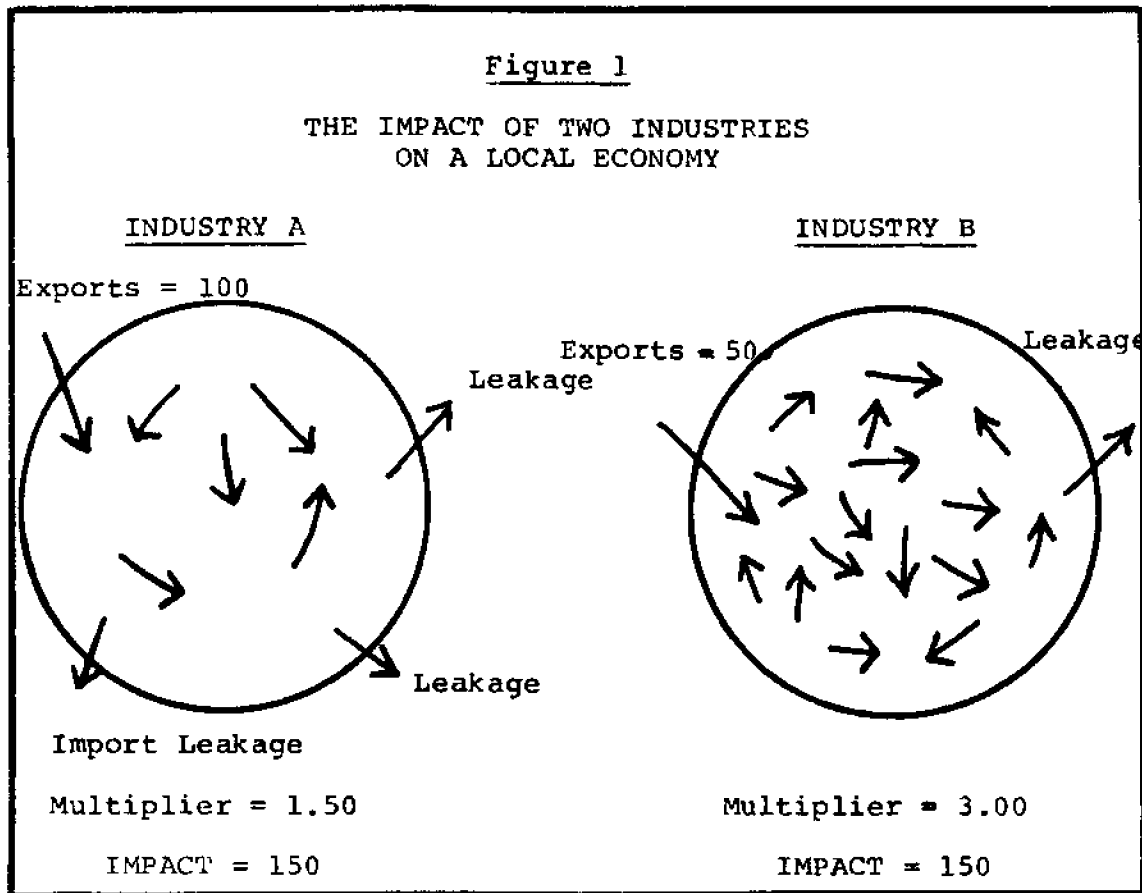
Because of the trading interrelationships between micro-units, both within and outside the community, a dollar expenditure results in economic activity of more than a dollar. An example to clarify this is presented in Schedule 2. A hotel makes \$100 in sales to a tourist (this is an export, because it is a service provided to a nonresident). The hotel pays \$40 in wages to local residents, \$30 to a local utility company, and purchases \$30 of imports. The local residents spend \$20 in a local food store and \$20 on a trip outside the community. The food store spends \$20 on imports from a nonlocal food wholesaler. The utility company, for the purposes of simplification, spends \$30 on imports of fuel. Thus, in this simplified example, the initial \$100 in sales of the hotel has resulted in economic activity of \$190 within

²"...as usually conceived, community economic system concepts exclude all savings and investment activity from the model even if carried out by residents of the community. The authors' experience shows that aspect to be reasonable at least for smaller-sized communities and especially for short-time intervals. However, when such models are used for long-term projections, a component denoting the relationship between local investment and community output growth is added." Floyd K. Harmston and Richard E. Lund, Application of an Input-Output Framework to a Community Economic System (Columbia, Mo.: University of Missouri Press, 1967), p. 13.

the community. This process is known as the multiplier effect of expenditures.

<u>Schedule 2</u>		
AN EXAMPLE OF THE MULTIPLIER EFFECT		
Units and Their Transactions	Economic Activity	
	Local	Nonlocal
1. Hotel		
Sale to tourist	\$100	
(2) Wages to resident	40	
(3) Payment to local utility	30	
Import		\$ 30
2. Local Wage-earner		
(4) Payment to food store	20	
Trip expenses		20
3. Utility		
Import		30
4. Food Store		
Import		20
TOTAL ECONOMIC ACTIVITY	\$190	\$100

Thus, the economic impact of an industry on a community depends on two factors: the exports that it generates (or the imports that it replaces) and the multiplier effect of its input expenditures. As demonstrated in Figure 1, an evaluation of an industry based on either one of the factors without considering the other could be misleading. Both industries in the example generate an equal amount of economic activity, but if only exports were considered, Industry A would appear to have the greatest impact, while if only the multiplier were considered, Industry B would appear to be the most beneficial.



INPUT-OUTPUT ANALYSIS ON THE REGIONAL LEVEL

The community multiplier, which can be computed given adequate data, is derived from the aggregation of the economic activity of all microunits in the community. While it provides a measure of the total impact of a change in demand on the community, it does not allow for the evaluation of the character of that change. Input-output analysis, on the other hand, involves the study of individual industries in an economy and their interrelationships with each other. Using input-output analysis, one can measure the various impacts of a change in final demand on each of the industries defined in the model.

Basically, input-output analysis requires the construction of a matrix of industries represented in an economy, together with sectors representing demand from within the community, demand from outside the community (exports), and inputs brought into the community from outside (imports).

A highly simplified input-output table is presented in Table 1.

		SALES				TOTAL DEMAND
		1	2	3	Exports	
1. Agriculture	P U	50	10	--	130	190
2. Retailing	R C	30	--	100	10	140
3. Households	H A	80	40	10	--	130
Imports	S E S	30	90	20	XXX	140
TOTAL INPUTS		190	140	130	140	

In the example, industry sales (output) are read across the rows and industry purchases (inputs) are read down the columns. Thus, agriculture, in this case, sold 50 to other agricultural units, 10 to retailers, none to local households, and 130 in exports. Similarly, reading down the column, agriculture purchased 50 from other agricultural units, 10 from retailers, and 80 from households (wages, rents, salaries), and 30 from units outside the community. Note that total inputs for each industry equal total outputs for that industry. The section of the table within the darkened lines is the community inter-industry transactions matrix. The rest of the table represents dealings with units outside the community. This table, the transactions table, is the first used in input-output analysis.

From the transactions table, a matrix of input coefficients is developed. The input coefficients of agriculture in this example are .26 (50/190) for agriculture, .5 (30/190) for retailing, and .42 (80/190) for households. These simply state that for every dollar of agricultural sales, 26¢ of inputs is purchased from other agricultural units, 15¢ from retailers, and 42¢ from local households.

An inverse matrix is then computed from the input coefficient table (this generally requires the use of an electronic computer) yielding a series of multipliers indicating the direct and indirect effect upon the industry heading the row by income received by the industry heading the column.

An example of a table of multipliers developed with input-output analysis is presented in Table 2. Reading the table, we see that for every \$1.00 of direct agricultural sales, agriculture receives an additional 75¢ due to economic turnover in the community. Similarly, \$1.00 of agricultural sales will result in 40¢ to retailers and 65¢ to households due to the turnover (multiplier effect). The total multiplier for agriculture is 2.80, indicating that the community gains \$2.80 for each \$1.00 in direct sales to agriculture. The total multipliers for retailing and households are 1.55 and 2.00, respectively.

Table 2

A SIMPLIFIED TABLE OF INDUSTRY MULTIPLIERS

	1	2	3
1. Agriculture	1.75	.30	.05
2. Retailing	.40	1.05	.55
3. Households	.65	.20	1.40
TOTAL MULTIPLIER	2.80	1.55	2.00

This brief presentation of the series of tables used in input-output analysis has been made to provide the non-technical reader with a basic understanding of procedures and to enable him to read an actual input-output table. A complete table derived for a community is more complex, involving a larger matrix, but the essential principles are the same.

The community multiplier and input-output analysis may be viewed as alternative approaches to studying a local economy. The latter, however, with its greater detail provides a much more complete picture of economic structure and

allows the analyst to determine the impacts of changes in demand on individual industries as well as the community as a whole. One of the important advantages of input-output analysis is that it allows the pattern of trade with the outside world to change as total output changes.³ This is especially important in evaluating the impact of variations in tourist expenditure patterns.

Clearly, input-output analysis is a useful tool for studying a community economic structure. Its primary weakness is felt to be its cost and the difficulty of obtaining accurate data. However, Harmston and Lund, who have used the method to study a small economy, have stated that its data requirements may not be more expensive than seemingly simpler approaches.⁴ Weighing the advantages and disadvantages of input-output analysis, we concluded that it was the tool best suited to our objective.

³Ibid., p. 23.

⁴Ibid., pp. vii-viii.

SECTION II

STUDY DESIGN AND DATA COLLECTION

STUDY DESIGN AND DATA COLLECTION

Site Selection

Our primary consideration in selecting a study area was that a substantial portion of its income be derived from tourism. Additionally, we felt that the area's boundaries should be defined to facilitate the collection of secondary economic information. It was also important that the area be small enough in terms of population and area that the study could be completed under our financial and time constraints. Several counties in northern Wisconsin met these criteria, and we selected Door County because it was in an area under study by other Sea Grant Scientists. Also, because it is bordered on three sides by Lake Michigan, including Green Bay, its tourist trade is to a significant extent related to waters included for study in the Sea Grant Program (Figure 2).

Definitions and Classifications

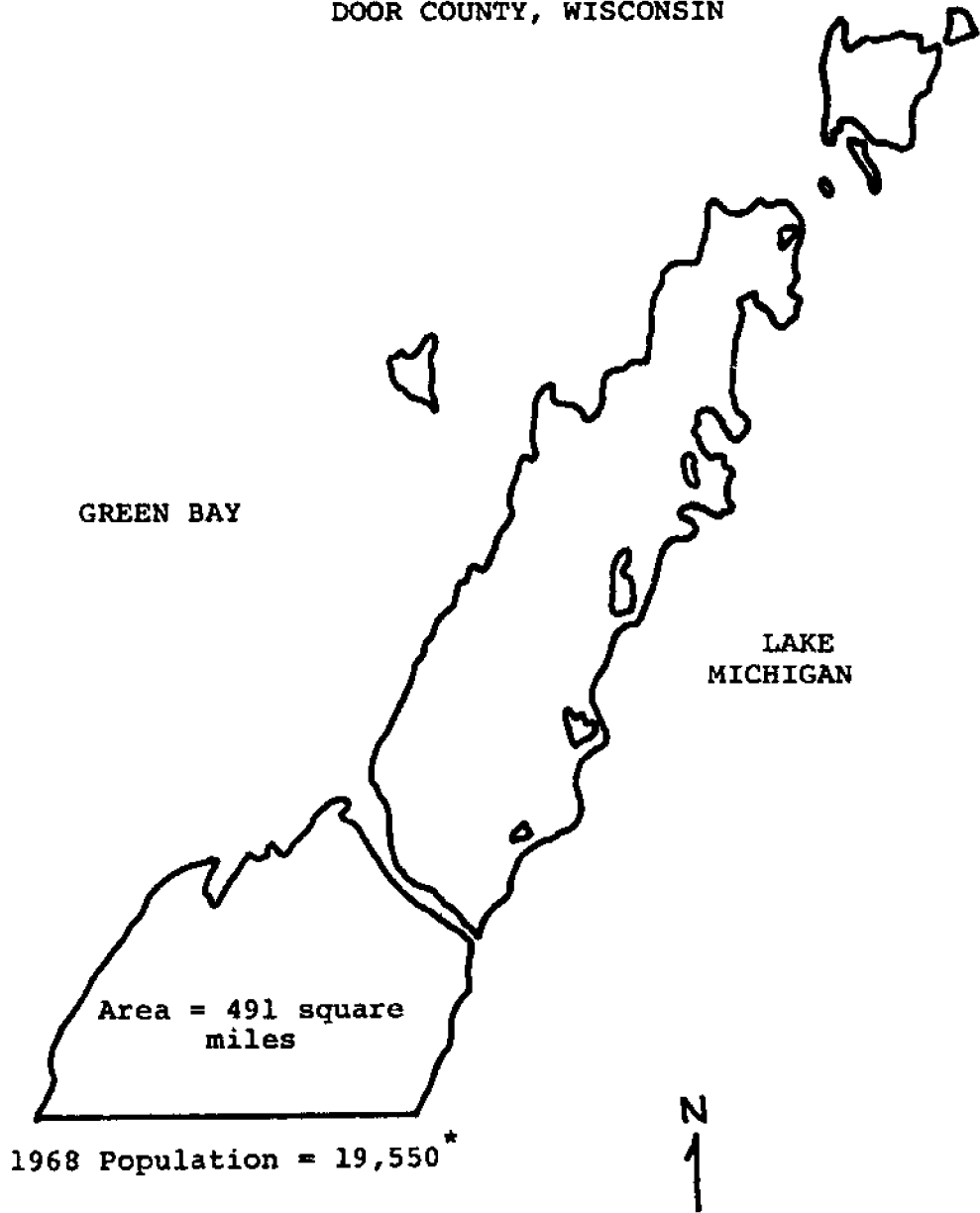
Following the lead of Harmston and Lund, we chose to use gross sales as an indicator of output. Thus, the multipliers developed indicate dollar turnover, a concept that is easily understood and that is meaningful to residents of a community. Sales by manufacturers, for instance, are considered inputs to wholesalers, whose sales in turn are inputs to retailers. Thus, the economic activity measured by the model involves double counting.

The classification of industries used in the model was based on our objective of measuring the impact of tourism on the county. Several manufacturing industries, usually considered as separate industries in input-output analyses, were aggregated into a single manufacturing sector, while retailing, often aggregated into a single sector, was broken down into nine categories. Local government and local households were considered as part of the inter-industry transactions matrix. The industry classification scheme is presented in Schedule 3. A more detailed explanation of the classifications used is available in Appendix A.

Exports were broken down into two categories: sales to tourists and other exports. Tourists were defined as "all nonresidents making purchases in Door County, except those from neighboring Kewaunee County," who considered Door County as part of their normal shopping area. Sales to this latter group were classed as other exports.

A sales to local investment category of outputs was established to account for items not representing current purchases, but representing current sales to the local seller.

Figure 2
DOOR COUNTY, WISCONSIN



* State of Wisconsin, Department of Industry, Labor, and Human Relations, August, 1970

Schedule 3

INDUSTRY CLASSIFICATIONS

1. Agriculture, Mining, Forestry, Fishing
2. Contract Construction
3. Manufacturing
4. Transportation, Communications, Utilities
5. Wholesalers
6. Farm Equipment Dealers, Building Material Suppliers
7. Personal and Business Services
8. Finance, Insurance, Real Estate
9. General Merchandise Stores
10. Food Stores
11. Automobile Dealers, Service Stations, Garages
12. Apparel Stores
13. Furniture and Appliance Stores, Home Furnishings
14. Eating and Drinking Places
15. Other Retail Stores
16. Lodging Places (Resorts, Hotels, Motels, Camp-grounds)
17. Amusement Places
18. Local Government
19. Local Households

Imports included the imports of goods and services for current consumption. This included payments by residents to nonresidents for labor and interest expense. Taxes paid to the state and federal governments by residents were also considered to represent imports, based on the assumption that services were provided equal to the taxes.

Sales by local government and local households require some explanation, because they are viewed from an unusual perspective. Local government sales were taken as all receipts from local taxes and fees. Local household sales included wages, salaries, rents, and profits assumed to be exchanged for the services of household members. The assumption was made that profits earned in the community accrued to residents in the community. This was undoubtedly true for most of the businesses studied, although it probably results in some overstatement of household sales (income).

The Choice of an Input-Output Model

Several types of input-output models have been developed for use by researchers. The first, and most commonly used,

is the static, open model, which is based on current flows only and which assumes fixed technical coefficients. The static model also assumes constant returns to scale for all sectors. "Few economists have been critical of the input-output technique when it is used for describing the structure of an economy at a given time."⁵ Criticism has been made, however, of its use for prediction. Miernyk, recognizing the weaknesses in input-output analysis, points out that nevertheless, "...input-output projections, which are highly disaggregated, are at least as accurate as those made by other techniques which project only a limited number of variables."⁶

A major alternative to static input-output analysis is the dynamic input-output model. The latter considers changes that take place as growth occurs (changing capital coefficients, changes in consumer taste, etc.). The data requirements for the dynamic model are considerably greater than for the static model.

We chose to use static input-output analysis for the Door County study, because it offered a satisfactory method for describing the current economic structure of the economy and used with caution provided a reasonable mechanism for predicting changes. Most significantly, its required data base could be built within our time and financial constraints. The static model should be revised periodically, perhaps every five years, and should be adjusted if a major economic development should occur in the community, such as the loss of a major industry.

Research Methods

The basic steps in developing the input-output table were: (1) establish control totals of gross sales for each industry; (2) obtain survey data about inter-industry transactions; (3) expand the inter-industry transactions data to the control totals; (4) balance the transactions table so that inputs equal outputs; (5) submit programs and data to the computer for calculation of the input coefficient matrix and the inverse coefficient matrix (the multiplier table); and (6) analyze the results.

⁵William Miernyk, The Elements of Input-Output Analysis (New York: Random House, 1965), p. 106.

⁶Ibid., p. 107.

Establishing Control Totals

Control totals were needed for four primary groups -- agriculture, businesses, local government, and households.

Total gross sales by agriculture were obtained from the State of Wisconsin Department of Agriculture. These included receipts from government under such programs as agricultural conservation and cropland adjustment. Gross sales in 1968 were estimated at \$14,029,000.

Local government sales (taxes and other receipts) were obtained from the State of Wisconsin Department of Revenue. These were estimated at \$3,756,000 for 1968, including all county and municipal revenues, except those of the highway department, which were classified as part of the construction industry.

A control total for local households was obtained from the U. S. Department of Commerce Office of Business Economics. The total initially obtained was \$53,720,000, but this was adjusted later to take account of differences in definition.

Most industries fell into the "business" category, where control totals were obtained directly from the tax records of individual businesses in the county. Using lists of businesses obtained from the Door County Chamber of Commerce together with telephone directories, we identified more than 1,000 businesses operating in the county. Working with several tax files in the State Department of Revenue, we were able to obtain the tax records of 699 businesses that were operating in 1968. Some businesses were found to have not been in operation in 1968, and the total number of firms was reduced to 999.

Gross sales for each industry were obtained from the available tax records and expanded to provide control totals. In many instances, this expansion required more than a simple extrapolation of the tax sample data. For instance, in the manufacturing industry, we had tax information from the largest firms; those missing were known to be medium-sized or small by Door County standards. The expansion to the control total therefore assumed that the nine missing firms had sales averaging the amount of sales earned by medium and small manufacturers in the tax sample. In many instances, the percentage of industry sales in the tax sample exceeded the percentage of firms. The control totals that were determined are found in column 5 of Table 3. Because of the care taken to obtain sales for all the largest firms and the cross-checking done with local businessmen to get their estimates of sales for the missing firms, we are confident that the control

Table 3
DATA USED TO CALCULATE CONTROL TOTALS

Industry	Number of Firms			Gross Sales (000's)		
	(1) Tax Sample	(2) Total Industry	(3) Sample % of Total	(4) Tax Sample	(5) Total Industry	(6) Sample % of Total
Mining, Fishing	26	34	76	685	896	76
Construction	51	58	88	3,829	4,354	88
Manufacturing	26	35	74	32,421	35,020	93
Trans, Comm, Util	25	47	53	6,873	7,757	89
Wholesalers	19	29	66	4,803	6,028	80
Farm Equip, Bldg Materials, Hdwe	17	23	74	3,885	5,256	74
Pers & Bus Services	87	127	69	2,684	3,918	69
Fin, Ins, Real Estate	38	64	59	3,797	4,761	80
Genl Mdse Stores	8	13	62	3,281	3,681	89
Food Stores	34	51	67	7,812	8,815	89
Auto Sales & Serv	47	67	70	8,852	10,183	87
Apparel Stores	12	14	86	1,198	1,398	86
Furn & Appl Stores	10	13	77	630	778	81
Eat & Drink Places	77	112	69	2,838	4,129	69
Other Stores	51	75	68	3,304	3,921	84
Lodging Places	148	198	75	2,764	3,489	79
Amusement Places	23	39	59	391	664	59
TOTAL	699	999	70	90,047	105,048	86

totals are reasonably accurate indications of actual gross sales by industry.

Obtaining Inter-Industry Transactions Data

The usual method of obtaining information about the sales and purchases of each industry to and from other industries is through the use of a survey. Because of time and financial limitations, we chose to survey only the business sector, using other methods to obtain information about agriculture, government, and households.

Agricultural sales by industry were obtained by using purchase information from the business survey, together with data from other input-output tables.⁷ Agricultural purchases by industry were estimated using information from other input-output tables.

Government sales (receipts) were estimated using information from the business survey, tax records, and local government accounting statements. Purchases from industry were obtained from the business survey and local government records.⁸

Household sales (receipts) were obtained from the business survey, tax records, local government accounting statements, and other input-output tables.⁹ Purchases came from the business survey and tax records.

Inter-industry transactions for the business sector were obtained from a survey of all companies in the county. Because the data needed required considerable thought and effort on the part of the respondents, we decided to send questionnaires to every firm, expecting the actual response rate to be low. The mail survey method was chosen, because it seemed best fitted to our limited financial situation. We

⁷The two major reference input-output tables were the 1963 national table and Harmston and Lund's table from their Wyoming study. Harmston and Lund, p. 34.

⁸The primary local government source was 1968 Proceedings of the County Board of Supervisors, Door County, Wisconsin. A sample was taken from the detailed expenditures presented in this book.

⁹The Harmston and Lund input-output table was used primarily to check to ensure that our results were not unusually inconsistent.

planned to supplement the mail survey with personal interviews with large firms not responding by mail and with firms in industries where the mail response was inadequate.

Our first series of mailings brought disappointing results. Less than 75 usable returns were received. A second series of mailings a few months later brought in another 50 usable returns and an interview trip to the county provided 29 more. If we were to conduct the study again, we would use personal interviews from the beginning. Cooperation with the personal interview is much better, especially if the interviewer already has sales and profit information considered to be confidential by many respondents (this can be obtained from tax records).

The sample on which the transactions table was based is detailed in Table 4. Our final sample included only slightly more than 15 percent of the firms in the county. However, because we made special efforts to obtain data from the largest firms, our sample accounted for 47 percent of the total gross sales in the county. A substantial portion of the sample sales came from the manufacturing sample, but in most other industries, the sample accounted for more than 20 percent of total industry sales. The weakest industry samples were in the fishing and mining sector, the transportation, communications, and utilities sector, and the home furnishings industry. Fishing and mining were aggregated with the much larger agricultural industry, so sample weaknesses were not very important. The transportation, communications, and utilities sample of 27 percent was considered somewhat weak, because some large firms with potentially diverse characteristics were missing. The sample for the home furnishings industry was suspect, because the quality of data from the return was marginally adequate.

In addition to the size of the sample, the homogeneity of the industry was an important factor in judging sample adequacy. Thus, the sample of food stores, a relatively homogeneous group, was considered adequate at 10 percent of the total firms and 17 percent of the total sales. Manufacturing, a much more diverse group of businesses, required a substantially larger sample to provide the desired confidence.

Although additional data would have been desirable, as it almost always is, we feel that the sample was adequate to provide a reasonably accurate picture of inter-industry transactions in Door County.

Table 4

THE SURVEY SAMPLE

Industry	Number of Firms			Gross Sales		(6) Sample % of Total
	(1) Sample	(2) Total Industry	(3) Sample % of Total	(4) Sample	(5) Total Industry	
Mining, Fishing	2	34	6	75	896	8
Construction	6	58	10	1,108	4,354	25
Manufacturing	13	35	37	29,546	35,020	84
Trans, Comm, Util	5	47	11	2,131	7,757	27
Wholesalers	4	29	14	1,063	6,028	17
Farm Equip, Bldg Mat, Hdwe	7	23	30	1,925	5,256	36
Pers & Bus Services	16	127	13	910	3,918	23
Fin, Ins, Real Estate	13	64	20	2,118	4,761	44
Genl Mdse Stores	1	13	8	431	3,681	12
Food Stores	11	51	22	3,250	8,815	37
Auto Sales & Service	9	61	15	3,183	10,183	31
Apparel Stores	5	14	36	412	1,398	29
Furn & Appliance Stores	2	13	15	241	778	31
Eating & Drinking Places	11	112	10	697	4,129	17
Other Retail	11	75	15	1,095	3,921	28
Lodging Places	28	198	14	1,098	3,489	31
Amusement Places	10	39	26	251	664	38
TOTAL	154	999	15	49,534	105,048	47

In addition to requests for information about the sources of their purchases, the business respondents were asked to allocate their sales among local and nonlocal individuals, businesses, and governments. These estimates were accepted as purchase data for households, local governments, tourists, and other export buyers. The total for local sales to businesses was reconciled with the purchase data obtained for local businesses. A full copy of the questionnaire is presented in Appendix B, together with other correspondence used in the mailing.

SECTION III

THE DOOR COUNTY INPUT-OUTPUT TABLES

THE DOOR COUNTY INPUT-OUTPUT TABLES

The basic results of the study, the input-output tables, are presented in this section. The tables represent, in a simplified form, the economic structure of the Door County community. A complete discussion of the economic implications of the tables would be lengthy and complex, because each table entry represents an economic interrelationship. However, in view of the study's objective of determining the tourism-recreation impact on the economy, the discussion of the community's basic economic structure is limited to the highlights.

The Transactions Table

The economic transactions that took place in Door County in 1968, as estimated from the survey of businesses and other sources, are presented in Table 5. Reading across the table, the reader can evaluate the allocation of sales by each industry among local industries and the export sector. Reading down the columns, the reader is presented with the allocation of purchases of each industry. Purchases include only those intended for current consumption, while sales include items purchased for local investment (sales to local investment). For instance, construction industry sales to other industries represent only that portion of construction work considered to be repair work. New buildings or major construction efforts are found in the sales to local investment column. While these major projects represent current sales to the construction industry, they do not represent current purchases by local industry.

Total economic transactions in 1968 equalled almost \$264 million. Manufacturing was the largest single industry with sales of \$35 million, followed by agriculture at almost \$15 million. Retailing actually was the largest sector, having total sales of \$38,161,000, but this was broken down into several categories, with auto sales and service the largest at slightly more than \$10 million and food stores close behind at almost \$9 million.

The balance of trade for the community as a whole was unfavorable--imports exceed exports. This is not unusual for a small community, because retailers must import most of what they sell. Manufacturers, although heavy importers, had a favorable balance of trade, because they exported almost all of their output. Agriculture and the tourist-oriented industries (eating and drinking places, lodging places, and amusement places) were the other major industries with a favorable balance of trade.

Table 5
 TRANSACTIONS TABLE
 DOOR COUNTY ECONOMY, 1968
 (Thousands of Dollars)

	1	2	3	4	5	6
1. Agriculture	3,593	45	3,232	1	---	---
2. Construction	15	1,646	9	41	---	10
3. Manufacturing	---	124	225	3	25	3
4. Transp, Comm, Util	78	95	257	653	49	85
5. Wholesalers	250	163	3	23	---	3
6. Bldg Mat, Farm Equip	196	712	35	89	14	0
7. Pers & Bus Serv	285	5	52	82	6	5
8. Fin, Ins, Real Estate	150	129	236	121	96	36
9. Genl Mdse Stores	---	33	9	---	3	---
10. Food Stores	---	26	3	---	---	---
11. Auto Sales & Serv	40	169	58	212	28	63
12. Apparel Stores	---	5	---	---	---	---
13. Furn & Appl Stores	---	12	---	---	1	---
14. Eat and Drink Places	---	7	13	---	4	---
15. Other Retail	34	12	34	32	7	10
16. Lodging Places	1	1	5	3	1	2
17. Amusement Places	---	---	---	---	---	---
18. Local Govt	294	27	166	426	30	37
19. Local Hshlds	6,538	2,019	8,028	2,521	1,841	904
20. Imports	1,851	1,242	21,821	3,008	3,785	4,038
21. Capital Consumption	1,600	310	834	542	138	60
22. Other	---	---	---	---	---	---
23. TOTAL INPUTS	14,925	6,782	35,020	7,757	6,028	5,256

Table 5

TRANSACTIONS TABLE
DOOR COUNTY ECONOMY, 1968
(Thousands of Dollars)

Industry Number	7	8	9	10	11	12
1. Agriculture	---	---	---	16	---	---
2. Construction	1	24	5	37	2	4
3. Manufacturing	11	---	---	309	119	2
4. Trans, Comm, Util	84	139	58	87	127	58
5. Wholesalers	47	---	20	173	2,120	---
6. Bldg Mat, Farm Equip	6	25	12	23	2	1
7. Pers & Bus Serv	42	60	15	12	80	7
8. Fin, Ins, Real Estate	83	264	42	15	100	28
9. Genl Mdse Stores	7	5	---	1	---	---
10. Food Stores	---	---	---	---	---	---
11. Auto Sales & Serv	40	160	25	15	450	4
12. Apparel Stores	---	---	---	---	1	---
13. Furn & Appl Stores	---	3	---	1	---	---
14. Eat and Drink Places	5	30	1	---	1	2
15. Other Retail	15	41	20	30	25	4
16. Lodging Places	5	10	2	2	5	---
17. Amusement Places	---	---	---	---	---	---
18. Local Govt	36	118	28	32	34	10
19. Local Hshlds	2,500	2,864	863	1,060	1,227	343
20. Imports	902	892	2,519	6,912	5,814	907
21. Capital Consumption	134	126	71	90	76	28
22. Other	---	---	---	---	---	---
23. TOTAL INPUTS	3,918	4,761	3,681	8,815	10,183	1,398

Table 5
 TRANSACTIONS TABLE
 DOOR COUNTY ECONOMY, 1968
 (Thousands of Dollars)

Industry Number	13	14	15	6	17	18	19
1. Agriculture	---	26	---	2	6	15	120
2. Construction	2	1	13	25	2	201	125
3. Manufacturing	---	31	---	---	1	68	136
4. Trans, Comm, Util	7	170	57	157	35	377	3,688
5. Wholesalers	---	461	100	128	32	145	592
6. Bldg Mat, Farm Equip	1	10	3	38	12	57	1,107
7. Pers & Bus Serv	2	110	27	146	24	58	1,215
8. Fin, Ins, Real Estate	5	135	22	155	12	57	1,252
9. Genl Mdse Stores	---	---	4	18	6	19	2,754
10. Food Stores	---	43	11	82	6	13	6,794
11. Auto Sales & Serv	5	19	32	30	7	60	5,440
12. Apparel Stores	---	---	2	2	---	28	824
13. Furn & Appl Stores	---	2	3	6	---	19	485
14. Eat & Drink Places	---	---	2	11	1	64	1,685
15. Other Retail	2	22	5	30	8	42	2,876
16. Lodging Places	---	---	2	---	---	---	220
17. Amusement Places	---	---	---	---	---	---	211
18. Local Govt	4	69	22	139	21	---	1,295
19. Local Hshlds	210	1,131	721	1,005	217	1,660	7,613
20. Imports	523	1,712	2,822	1,018	184	873	15,553
21. Capital Consumption	17	187	73	497	90	---	---
22. Other	---	---	---	---	---	---	1,600 ^a
23. TOTAL INPUTS	778	4,129	3,921	3,489	664	3,756	55,585

^aRepresents savings and payments on home mortgages

Table 5

TRANSACTIONS TABLE
DOOR COUNTY ECONOMY, 1968
(Thousands of Dollars)

Industry Number	Sales to Local Invest.	Export Demand		TOTAL
		Tourists	Other Exports	
1. Agriculture	---	30	7,839	14,925
2. Construction	3,883	383	353	6,782
3. Manufacturing	---	---	33,963	35,020
4. Trans, Comm, Util	---	233	1,263	7,757
5. Wholesalers	---	40	1,728	6,028
6. Bldg Mat, Farm Equip	1,505	604	804	5,256
7. Pers & Bus Serv	---	381	1,304	3,918
8. Fin, Ins, Real Estate	---	1,229	594	4,761
9. Genl Mdse Stores	---	504	318	3,681
10. Food Stores	---	1,461	376	8,815
11. Auto Sales & Serv	960	1,090	1,276	10,183
12. Apparel Stores	---	511	25	1,398
13. Furn & Appl Stores	---	235	11	778
14. Eat & Drink Places	---	2,288	15	4,129
15. Other Retail	---	523	149	3,921
16. Lodging Places	---	3,002	228	3,489
17. Amusement Places	---	450	3	664
18. Local Govt	---	100	868	3,756
19. Local Hshlds	---	100	12,220	55,585
20. Imports	XXX	XXX	XXX	76,376
21. Capital Consumption	XXX	XXX	XXX	4,873
22. Other	XXX	XXX	XXX	1,600
23. TOTAL	6,348	13,164	63,337	263,695

The Input Coefficient Table

The input coefficients presented in Table 6 indicate the percentage of total inputs obtained from each industry. The table should be read down the columns and the total input coefficients, including those from outside the local economy, should add to 1.0000.

The largest local input for every industry, except food stores, was local households. Inputs from local households included wages, salaries, rents, and profits. Because the major earnings to the households came from wages, salaries, and proprietor's earnings, the input coefficient for this sector offers a general indicator of the degree of labor intensiveness of the industries. By this standard, the personal and business services sector was the most labor intensive with almost 64 percent of its inputs coming from local households. Finance, insurance, and real estate were also high with more than 60 percent of its inputs representing payments to local households. In contrast, food stores and automobile sales and service paid only 12 percent of their inputs to local households.

There was a wide divergence in the total local input coefficients (representing the percentage of inputs purchased within Door County). Several industries, including agriculture, construction, personal and business services, finance, insurance, and real estate, and local government, purchased more than 70 percent of their inputs locally. Other industries, food stores at 20 percent, farm equipment dealers and building material suppliers at 22 percent, and other retail at 26 percent, depended much less on local purchases to conduct their businesses.

The Multiplier Table

By inverting the matrix in Table 6, a table of inverse coefficients was prepared. These inverse coefficients, presented in Table 7, represent multipliers for each industry. The multipliers indicate the total direct and indirect activity stimulated by \$1.00 of sales to the industry at the head of the column.

For instance, in column 1 (agriculture), one dollar of sales to agriculture generates a total of \$1.32 of agricultural sales, 3¢ of sales for the construction industry, 1¢ of sales for manufacturing, 9¢ of sales for transportation, communications, and utilities, etc. In total, one dollar of sales to agriculture generates \$3.02 of sales to the community, through the direct and the multiplier effects.

Table 6

INPUT COEFFICIENT TABLE
DOOR COUNTY ECONOMY, 1968

	1 ^a	2	3	4	5	6
1. Agriculture	.2407	.0066	.0923	.0001	---	---
2. Construction	.0010	.2427	.0003	.0053	---	.0019
3. Manufacturing	---	.0183	.0064	.0004	.0041	.0006
4. Trans, Comm, Util	.0052	.0140	.0073	.0842	.0081	.0162
5. Wholesalers	.0168	.0240	.0001	.0030	---	.0006
6. Bldg Mat, Farm Equip	.0131	.1050	.0001	.0115	.0023	---
7. Pers & Bus Serv	.0191	.0007	.0015	.0106	.0001	.0001
8. Fin, Ins, Real Estate	.0101	.0190	.0067	.0156	.0159	.0068
9. Genl Mdse Stores	---	.0049	.0003	---	.0005	---
10. Food Stores	---	.0038	.0001	---	---	---
11. Auto Sales & Serv	.0027	.0249	.0017	.0273	.0046	.0120
12. Apparel Stores	---	.0001	---	---	---	---
13. Furn & Appl Stores	---	.0018	---	---	.0002	---
14. Eat & Drink Places	---	.0010	.0004	---	.0007	---
15. Other Retail	.0023	.0018	.0010	.0041	.0012	.0019
16. Lodging Places	.0001	.0001	.0001	.0004	.0002	.0004
17. Amusement Places	---	---	---	---	---	---
18. Local Govt	.0197	.0040	.0047	.0549	.0050	.0070
19. Local Hshlds	.4381	.2977	.2292	.3250	.3054	.1720
TOTAL LOCAL COEFFICIENT	.7689	.7704	.3522	.5424	.3483	.2195
20. Imports	.1240	.1831	.6231	.3878	.6279	.7683
21. Capital Consumption	.1072	.0457	.0238	.0699	.0229	.0114
22. Other	---	---	---	---	---	---
23. TOTAL ^b	1.0000	.9992	.9991	1.001	.9991	.9992

^aColumn heading numbers correspond to industry numbers in the rows.

^bDue to rounding, not all columns add to exactly 1.000.

Table 6
 INPUT COEFFICIENT TABLE
 DOOR COUNTY ECONOMY, 1968

Industry Number ^a	7	8	9	10	11	12
1. Agriculture	---	---	---	.0018	---	---
2. Construction	.0003	.0050	.0014	.0042	.0002	.0029
3. Manufacturing	.0028	---	---	.0351	.0117	.0014
4. Trans, Comm, Util	.0214	.0292	.0158	.0099	.0125	.0415
5. Wholesalers	.0120	---	.0054	.0196	.2080	---
6. Bldg Mat, Farm Equip	.0015	.0053	.0033	.0026	.0002	.0007
7. Pers & Bus Serv	.0107	.0126	.0041	.0014	.0079	.0050
8. Fin, Ins, Real Estate	.0212	.0555	.0114	.0017	.0098	.0200
9. Genl Mdse Stores	.0018	.0011	---	.0001	---	---
10. Food Stores	---	---	---	---	---	---
11. Auto Sales & Serv	.0102	.0336	.0068	.0017	.0442	.0029
12. Apparel Stores	---	---	---	---	---	---
13. Furn & Appl	---	.0006	---	.0001	---	---
14. Eat & Drink Places	.0013	.0063	.0003	---	.0001	.0014
15. Other Retail	.0038	.0086	.0054	.0034	.0025	.0029
16. Lodging Places	.0013	.0021	.0005	.0002	.0005	---
17. Amusement Places	---	---	---	---	---	---
18. Local Govt	.0092	.0248	.0076	.0036	.0033	.0072
19. Local Hshlds	.6381	.6016	.2345	.1203	.1205	.2454
TOTAL LOCAL COEFFICIENT	.7356	.7863	.2965	.2057	.4216	.3313
20. Imports	.2302	.1874	.6843	.7841	.5710	.6488
21. Capital Consumption	.0342	.0265	.0193	.0102	.0074	.0200
22. Other	---	---	---	---	---	---
TOTAL ^b	1.0000	1.0002	1.0001	1.0000	1.0000	1.0001

^a Column heading numbers correspond to industry numbers in the rows.

^b Due to rounding, not all columns add exactly to 1.0000.

Table 6
 INPUT COEFFICIENT TABLE
 DOOR COUNTY ECONOMY, 1968

Industry Number ^a	13	14	15	16	17	18	19
1. Agriculture	---	.0063	---	.0006	.0090	.0040	.0022
2. Construction	.0026	.0002	.0033	.0072	.0030	.0535	.0023
3. Manufacturing	---	.0075	---	---	.0015	.0181	.0025
4. Trans, Comm, Util	.0090	.0412	.0145	.0450	.0527	.1004	.0664
5. Wholesalers	---	.1117	.0255	.0367	.0482	.0386	.0107
6. Bldg Mat, Farm Equip	.0013	.0024	.0008	.0109	.0181	.0152	.0199
7. Pers & Bus Serv	.0026	.0266	.0069	.0419	.0361	.0154	.0219
8. Fin, Ins, Real Estate	.0064	.0327	.0056	.0444	.0181	.0152	.0225
9. Genl Mdse Stores	---	---	.0010	.0052	.0090	.0051	.0496
10. Food Stores	---	.0104	.0028	.0235	.0090	.0035	.1222
11. Auto Sales & Serv	.0064	.0046	.0082	.0086	.0105	.0160	.0979
12. Apparel Stores	---	---	.0005	.0006	---	.0075	.0148
13. Furn & Appl Stores	---	.0005	.0008	.0017	---	.0051	.0087
14. Eat & Drink Places	---	---	.0005	.0032	.0015	.0170	.0303
15. Other Retail	.0026	.0053	.0013	.0086	.0121	.0112	.0517
16. Lodging Places	---	---	.0005	---	---	---	.0040
17. Amusement Places	---	---	---	---	---	---	.0038
18. Local Govt	.0051	.0167	.0056	.0398	.0316	---	.0233
19. Local Hshlds	.2699	.2739	.1839	.2881	.3268	.4420	.1370
TOTAL LOCAL COEFFICIENT	.3059	.5400	.2617	.5660	.5872	.7678	.6917
20. Imports	.6722	.4146	.7197	.2918	.2771	.2324	.2798
21. Capital Consumption	.0219	.0453	.0186	.1425	.1355	---	---
22. Other	---	---	---	---	---	---	.0288
TOTAL ^b	1.0000	.9999	1.0000	1.0003	.9998	1.0002	1.0003

Table 7
 DIRECT AND INDIRECT ACTIVITY PER EXPORT DOLLAR
 DOOR COUNTY ECONOMY, 1968

	1	2	3	4	5	6
1. Agriculture	1.3221	.0183	.1247	.0041	.0030	.0016
2. Construction	.0327	1.3439	.0149	.0314	.0155	.0121
3. Manufacturing	.0099	.0323	1.1010	.0084	.0091	.0037
4. Trans, Comm, Util	.0922	.0871	.0483	1.1541	.0515	.0435
5. Wholesalers	.0657	.0721	.0227	.0407	1.0227	.0164
6. Bldg Mat, Farm Equip	.0423	.1580	.0144	.0310	.0150	1.0080
7. Pers & Bus Serv	.0513	.0218	.0162	.0301	.0144	.0092
8. Fin, Ins, Real Estate	.0457	.0526	.0232	.0404	.0327	.0171
9. Genl Mdse Stores	.0465	.0419	.0224	.0313	.0244	.0142
10. Food Stores	.1138	.0920	.0544	.0763	.0587	.0347
11. Auto Sales & Serv	.1071	.1159	.0513	.1016	.0582	.0445
12. Apparel Stores	.0142	.0117	.0067	.0098	.0073	.0043
13. Furn & Appl Stores	.0085	.0088	.0040	.0059	.0045	.0026
14. Eat & Drink Places	.0295	.0238	.0144	.0205	.0158	.0090
15. Other Retail	.0539	.0417	.0255	.0392	.0274	.0175
16. Lodging Places	.0041	.0034	.0021	.0031	.0022	.0016
17. Amusement Places	.0035	.0027	.0017	.0023	.0018	.0011
18. Local Govt	.0574	.0321	.0233	.0814	.0215	.0175
19. Local Hshlds	.9243	.7055	.4410	.6171	.4767	.2811
TOTAL MULTIPLIER	3.0247	2.8656	2.0112	2.3287	1.8624	1.5397

Table 7
 DIRECT AND INDIRECT ACTIVITY PER EXPORT DOLLAR
 DOOR COUNTY ECONOMY, 1968

	7	8	9	10	11	12
1. Agriculture	.0056	.0056	.0021	.0079	.0033	.0025
2. Construction	.0326	.0409	.0146	.0129	.0110	.0181
3. Manufacturing	.0131	.0113	.0041	.0378	.0166	.0060
4. Trans, Comm, Util	.1124	.1259	.0522	.0312	.0458	.0839
5. Wholesalers	.0597	.0555	.0248	.0305	.2332	.0207
6. Bldg Mat, Farm Equip	.0281	.0336	.0139	.0093	.0096	.0129
7. Pers & Bus Serv	1.0388	.0424	.0151	.0078	.0179	.0175
8. Fin, Ins, Real Estate	.0560	1.0938	.0253	.0101	.0258	.0361
9. Genl Mdse Stores	.0519	.0519	1.0193	.0112	.0164	.0212
10. Food Stores	.1229	.1244	.0471	1.0271	.0399	.0518
11. Auto Sales & Service	.1222	.1502	.0504	.0268	1.0842	.0516
12. Apparel Stores	.0152	.0155	.0059	.0034	.0051	1.0064
13. Furn & Appl Stores	.0091	.0100	.0035	.0021	.0030	.0039
14. Eat & Drink Places	.0329	.0388	.0125	.0070	.0106	.0149
15. Other Retail	.0587	.0647	.0266	.0156	.0208	.0263
16. Lodging Places	.0056	.0066	.0022	.0012	.0020	.0019
17. Amusement Places	.0038	.0038	.0015	.0008	.0012	.0016
18. Local Govt	.0438	.0617	.0215	.0120	.0166	.0241
19. Local Hshlds	.9978	1.0087	.3824	.2196	.3240	.4201
TOTAL MULTIPLIER	2.8102	2.9453	1.7250	1.4743	1.8870	1.8215

Table 7
 DIRECT AND INDIRECT ACTIVITY PER EXPORT DOLLAR
 DOOR COUNTY ECONOMY, 1968

	13	14	15	16	17	18	19
1. Agriculture	.0022	.0125	.0018	.0046	.0159	.0129	.0074
2. Construction	.0170	.0202	.0149	.0326	.0274	.0984	.0453
3. Manufacturing	.0044	.0146	.0037	.0085	.0095	.0288	.0143
4. Trans, Comm, Util	.0471	.0998	.0448	.1112	.1206	.1878	.1257
5. Wholesalers	.0205	.1406	.0421	.0707	.0831	.0856	.0642
6. Bldg Mat, Farm Equip	.0128	.0189	.0099	.0300	.0373	.0463	.0376
7. Pers & Bus Serv	.0143	.0441	.0160	.0612	.0561	.0410	.0394
8. Fin, Ins, Real Estate	.0208	.0571	.0174	.0710	.0442	.0493	.0468
9. Genl Mdse Stores	.0210	.0287	.0169	.0361	.0416	.0474	.0731
10. Food Stores	.0514	.0803	.0416	.0988	.0883	.1068	.1795
11. Auto Sales & Serv	.0534	.0713	.0443	.0814	.0861	.1155	.1598
12. Apparel Stores	.0064	.0087	.0053	.0101	.0100	.0202	.0221
13. Furn & Appl Stores	1.0038	.0058	.0037	.0085	.0061	.0128	.0132
14. Eat & Drink Places	.0132	1.0185	.0105	.0234	.0225	.0436	.0456
15. Other Retail	.0255	.0373	1.0187	.0434	.0483	.0580	.0793
16. Lodging Places	.0018	.0026	.0019	1.0028	.0029	.0037	.0062
17. Amusement Places	.0016	.0022	.0012	.0023	1.0024	.0032	.0055
18. Local Govt	.0195	.0400	.0172	.0651	.0578	1.0356	.0470
19. Local Hshlds	.4176	.5673	.3143	.6092	.6426	.8356	1.4584
TOTAL MULTIPLIER	1.7543	2.2705	1.6262	2.3699	2.4027	2.8334	2.4704

This occurs because payments by agriculture to other local industries are respent by the recipients, resulting in a continuing recycling of funds until they leak out of the community through payments made outside the community.

The multipliers for the several local industries vary widely according to the amount of interaction that each industry has with other economic units in the community. Agriculture has the highest total multiplier at 3.02, followed by finance, insurance, and real estate at 2.95, construction at 2.87, local government at 2.83, and personal and business services at 2.81. The lowest multipliers are food stores at 1.47, farm equipment and building material suppliers at 1.54, other retail at 1.63, and furniture and appliance stores at 1.75.

The community multiplier represents the average of the industry multipliers with each industry being weighted according to its current (1968) sales. It is calculated at 2.29 as shown in Table 8. This means that the average dollar flowing into the community results in \$2.29 of economic activity to the community.

In Table 8, the total sales column shows the amount of community sales created by the activity of the industry in each row. If the agricultural industry were to disappear overnight, total sales in the community would decline by more than \$45 million, because of the impacts on other industries.

The basic structure of the Door County economy has been established. Using this framework, it is now possible to evaluate the impact of recreation-tourism on the community.

Table 8

CALCULATION OF THE COMMUNITY MULTIPLIER

Industry	Direct Sales (000's)	Multiplier	Total Sales ^a (000's)
Agriculture	\$ 14,925	3.0247	\$ 45,144
Construction	6,782	2.8656	19,434
Manufacturing	35,020	2.0112	70,432
Trans, Comm, Util	7,757	2.3287	18,064
Wholesalers	6,028	1.8624	11,227
Farm Equip, Bldg Mat	5,256	1.5397	8,093
Pers & Bus Serv	3,918	2.8102	11,010
Fin, Ins, Real Estate	4,761	2.9453	14,023
Genl Mdse Stores	3,681	1.7250	6,350
Food Stores	8,815	1.4743	12,996
Auto Sales & Serv	10,183	1.8870	19,215
Apparel Stores	1,398	1.8215	2,546
Furn & Appl Stores	778	1.7543	1,356
Eat & Drink Places	4,129	2.2705	9,375
Other Retail	3,921	1.6262	6,376
Lodging Places	3,489	2.3699	8,269
Amusement Places	664	2.4027	1,595
Local Govt	3,756	2.8334	10,642
Local Hsholds	55,585	2.4704	137,317
TOTAL	\$180,846	2.2862	\$413,464

^aTotal sales represent the sales resulting in the community, because of sales to the particular industry. The total of this column exceeds the actual total sales in the community.

SECTION IV

RECREATION AND THE DOOR COUNTY ECONOMY

RECREATION AND THE DOOR COUNTY ECONOMY

Recreation is a multi-billion dollar industry in the United States. It is a fragmented industry, including the manufacturers of recreation equipment, the media, the government, professional sports, hotels and motels, and eating and drinking places. It is also a growing industry. In the United States, leisure time increased from 27 percent of total time in 1900 to 34 percent in 1950; by 2000, it is expected to increase further to 37 percent of total time.¹⁰ With the anticipated increase in leisure time and increasing needs for the refreshment of physical and mental energies, recreation seems likely to play an even larger role in the American society of the future.

An important segment of the recreation industry is outdoor recreation. To many small communities located outside our growing population centers, outdoor recreation is a major attraction to tourists, who provide essential revenues to the local economy.

Some communities may conclude that because of low wages, seasonal work, low profits, extra governmental costs (e.g. roads and police protection), and the despoilation of resources, the costs of a tourist industry outweigh the benefits. Other local areas, having few viable economic alternatives for generating income, are forced to structure their economies around the tourist industry. In both cases, it is important to understand the total impact of tourism on the community, either to choose whether or not to promote tourism or to control the quality of tourism so that it has a favorable impact on the community.

In this study, we concerned ourselves with the short-run economic impact of tourism on the economy of Door County, Wisconsin, an area deriving substantial revenues from tourists attracted by outdoor recreation opportunities. Using input-output analysis, we determined the effects of tourism on individual industries as well as the community as a whole. The input-output tables developed also allowed the consideration of multiplier effects of tourist dollars on the local economy.

¹⁰Mary A. Holman, "A National Time-Budget for the Year 2000," Sociology and Social Research, Vol. 46, No. 1 (October, 1961).

The Direct and Indirect Effects of Tourist Expenditures on the Door County Economy

The total direct impact of the expenditures of all tourists coming to Door County in 1968 was \$13,164,000.¹¹ This money was primarily generated by industries usually thought of as being tourist-oriented: lodging places, 23 percent; eating and drinking places, 17 percent; food stores, 11 percent; and automobile service, 8 percent. However, because of the substantial summer resident trade, industries such as finance, insurance, and real estate (primarily the latter) accounted for 9 percent of sales to tourists, and building material suppliers for almost 5 percent.

The presentation of direct tourist expenditures accruing to each industry and the benefits that industry receives from the multiplier effects of expenditures in all the industries, are presented in Table 9. For instance, agriculture received \$30,000 directly from tourists in 1968. In addition, tourist expenditures in agriculture and all the other industries resulted in additional sales for agriculture of \$98,000.

Thus, Table 9 is oriented toward showing the benefits received by each industry from tourist expenditures. This clearly displays the importance of the indirect benefits to many industries. For instance, wholesalers receive only about \$40,000 directly from tourists, but indirectly, they receive \$1,076,000, because other industries purchase from them to support their tourist sales.

Local households, of course, are the single largest beneficiary of the tourist industry. Although they receive only \$100,000 directly from tourists, through wages and salaries, rents, and profits received from the other industries, they receive an additional \$7,139,000. Thus, local households receive more than 13 percent of their total revenue as a result of tourism.

The impact of tourism on government is also interesting. Directly, in the primary form of property taxes by summer home owners, the government receives an estimated \$100,000. However, because tourism results in added values of properties in other industries, the government receives an additional \$530,000 in revenues as a result of tourism. This

¹¹Tourists, for the purposes of this study, were defined to include summer residents owning cottages or homes in the county as well as the shorter-term visitors.

Table 9

DIRECT AND INDIRECT EFFECT OF TOURIST EXPENDITURES
DOOR COUNTY ECONOMY, 1968
(Thousands of Dollars)

Industry	(1)	(2)	(3)	(4)
	Direct Earnings	Multiplier Induced Benefit	Total Earnings	Total/Direct
1. Agriculture	30	98	128	4.27
2. Construction	383	439	822	2.15
3. Manufacturing	---	186	186	n/a
4. Trans, Comm, Util	233	1,145	1,378	5.91
5. Wholesalers	40	1,076	1,116	27.90
6. Bldg Mat, Farm Equip	604	331	935	1.52
7. Pers & Bus Serv	381	467	848	2.23
8. Fin, Ins, Real Estate	1,229	641	1,870	1.47
9. Genl Mdse Stores	504	391	895	1.78
10. Food Stores	1,461	995	2,456	1.68
11. Auto Sales & Serv	1,090	1,024	2,114	1.94
12. Apparel Stores	511	115	626	1.23
13. Furn & Appl Stores	235	77	312	1.33
14. Eat & Drink Places	2,288	257	2,545	1.11
15. Other Retail	523	479	1,002	1.92
16. Lodging Places	3,002	38	3,040	1.01
17. Amusement Places	450	27	477	1.06
18. Local Govt	100	530	630	6.30
19. Local Hshlds	100	7,139	7,239	72.39
TOTAL	13,164	15,455	28,619	2.17

is almost 17 percent of total local government revenues.

Industries receiving direct income primarily from tourists, earn relatively little through the multiplier induced benefits. This is especially true of lodging places, amusement places, and eating and drinking places.

The impact of tourists expenditures can be viewed in another way--as to their value for the local economy rather than their value to each industry. In Table 10, the expenditures to each industry and the total impact of these on the local economy are shown. The data in column three refer to the total economic activity generated by the direct expenditures in column one. For instance, agriculture receives \$30,000 directly from tourists and this money, through the multiplier effect eventually means \$91,000 of sales to the community.

Table 10

THE VALUE OF TOURIST EXPENDITURES BY
INDUSTRY TO THE TOTAL COMMUNITY
(Thousands of Dollars)

Industry	(1) Direct Tourist Receipts	(2) Multiplier	(3) Total Community Impact
1. Agriculture	30	3.0247	91
2. Construction	383	2.8656	1,098
3. Manufacturing	---	2.0112	---
4. Trans, Comm, Util	233	1.8624	543
5. Wholesalers	40	1.5397	74
6. Bldg Mat, Farm Equip	604	2.8102	930
7. Pers & Bus Serv	381	2.9453	1,071
8. Fin, Ins, Real Estate	1,229	1.7250	3,620
9. Genl Mdse Stores	504	1.4743	869
10. Food Stores	1,461	1.8870	2,154
11. Auto Sales & Serv	1,090	1.8215	2,057
12. Apparel Stores	511	1,7543	931
13. Furn & Appl Stores	235	2.2705	412
14. Eat & Drink Places	2,288	1.6262	5,195
15. Other Retail	523	2.3699	851
16. Lodging Places	3,002	2.4027	7,114
17. Amusement Places	450	2.8334	1,081
18. Local Govt	100	2.4704	283
19. Local Hshlds	100		247
TOTAL	13,164	2.1741	28,621

The usefulness of the multiplier concept is aptly shown by the data in Table 10. Looking at the direct receipts from tourists, it appears that finance, insurance, and real estate sales to tourists rank fourth among the industries, slightly below food stores. However, because of a high multiplier effect, the total impact of tourist receipts by finance, insurance and real estate is \$3,620,000, well above the \$2,154,000 generated by food stores.

The tourist multiplier for the community is 2.1741. This means that for every \$1.00 of receipts from tourists, \$2.17 of total sales is generated in the community. The tourist multiplier represents a weighted average of the various impacts of tourist expenditures to the different industries. An alteration in the pattern of tourist expenditures (e.g., more to construction and less to food stores) would result in a change in the tourist multiplier.

Direct receipts from tourists were \$13,164,000 in 1968, but the total impact on the Door County economy was \$28,619,000, more than twice the direct impact. This equals 10.8 percent of the total sales generated in the community. Tourism, as an industry, ranked behind only manufacturing and agriculture in total economic importance in the community.

General Applications of the Findings

The primary usefulness of input-output analysis lies in the understanding it offers about the economic workings of the community. With this understanding, economic planners can evaluate the impacts of various plans they might develop. They can see which industries have the greatest positive impact on the community per dollar of direct output (those with the highest multipliers). If feasible, they could plan to increase the output of these industries by attracting new businesses and aiding the businesses they already have. Alternatively, they could evaluate the conditions resulting in low multipliers for some industries and seek to change conditions so that the multipliers are increased. For instance, in Door County food stores have a low multiplier effect. It might be practical to attract a food wholesaler to the county thus reducing the imports made by food stores.

Individual industries can also use the input-output tables to determine which industries have sales with the greatest total impact on them. For instance, as shown in Table 11, local government could determine that its revenues would be most benefited by an increase in sales by the

transportation, communications, and utilities industry.

Table 11

INDUSTRIES WITH THE GREATEST ECONOMIC INTERACTION

Industry	Industry With Greatest Interaction	Amounts Of Interaction ^a
1. Agriculture	Agriculture	.3221
2. Construction	Construction	.3439
3. Manufacturing	Manufacturing	.1010
4. Trans, Comm, Util	Local Government	.1878
5. Wholesalers	Auto Sales & Serv	.2332
6. Farm Equip, Bldg Mat	Construction	.1580
7. Pers & Bus Serv	Lodging Places	.0612
8. Fin, Ins, Real Estate	Fin, Ins, Real Estate	.0938
9. Genl Mdse Stores	Local Households	.0731
10. Food Stores	Local Households	.1795
11. Auto Sales & Serv	Local Households	.1598
12. Apparel Stores	Local Households	.0221
13. Furn & Appl Stores	Local Households	.0132
14. Eat & Drink Places	Local Households	.0456
15. Other Retail	Local Households	.0793
16. Lodging Places	Fin, Ins, Real Estate	.0066
17. Amusement Places	Local Households	.0055
18. Local Govt	Trans, Comm, Util	.0814
19. Local Hshlds	Fin, Ins, Real Estate	1.0087

^aFor every \$1.00 of sales to the interacting industry, the industry in column one would receive this proportion of sales.

Most industries would probably guess correctly in determining which other industry was most important to its sales. However, using the multiplier tables (Table 7, pages 36-38), individual industries can determine which industries are second, third, and fourth in importance. For example, food stores would discover that after local households, the finance, insurance, and real estate, the personal and business services, and the agriculture industries also provide economic activity resulting in important sales to them.

One of the most important uses of input-output data is forecasting. If a change in sales of one industry is projected, other industries can determine the expected increase

in sales to them. For example, if manufacturers in Door County expect a \$2,000,000 increase in sales, farmers in the county can estimate the added demand that this will generate for their products (\$249,400 using inter-industry multiplier of .1247--see Table 7, page 36). Of course, the aggregation of individual businesses into industries calls for caution in applying these forecasting techniques. A substantial portion of the Door County manufacturing industry is shipbuilding, which has relatively little impact on agriculture. However, where industries are broken out in greater detail, as in retailing, such an application has great merit.

Politically, the input-output results are also potentially useful. Often, individuals in a community seek favors for their particular industry, but argue against advantages for other industries. Input-output analysis can be used to demonstrate the common interest of the community in promoting its various industries. Tourism, for example, benefits a much wider group than would be expected by simply considering direct tourist expenditures. Many community groups should have an interest in promoting tourism, based on the short-run economic impacts of the industry.

Resource Management and Input-Output Analysis

Potentially, input-output analysis is a tool of great usefulness to resource managers. Its applications allow the manager to trace the economic impacts of resource decisions through the entire economy. In addition to the aid it provides for rational decisionmaking, it also can be politically useful in generating support for seemingly narrow decisions that have a wide impact in fact.

However, input-output analysis alone is of little use to the resource manager. It can only be applied after research has established the direct economic impact of the resource decision. For instance, public officials considering an anti-pollution ordinance that would cause local industries to increase their operating expenses would have to determine the immediate effect of this increased expense on the industries' sales. It might be determined through research that such an ordinance would cause local manufacturers to lose \$2,000,000 of sales, while the cleaner water would bring another \$1,900,000 of tourist trade to the area. Based solely on short-run economic criteria (other factors should also be considered), this would seem to be an unwise decision. However, applying the manufacturing and tourist multipliers, 2.0112 and 2.1741, respectively, the decisionmaker could see that the total negative impact from manufacturing would

be \$4,022,400, while the positive impact due to tourism would be \$4,130,790.

The most difficult research questions relate to determining the direct relationship between resource quality and the economy. The ultimate objective of this study is to relate water quality to the sales of the tourist industry in Door County. Accomplishing this requires two major stages of research beyond the present project.

First, it is necessary to segment the tourist market for Door County into smaller groups, based on the tourists varying attitudes about the importance of water quality. For instance, golfers coming to the county may have relatively little interest in water quality, but fishermen will have a strong interest in the capacity of the waters to support a fish population. Swimmers will be interested in the safety of the water as well as its temperature. Each of these tourist groups is likely to have different expenditure patterns, and therefore a varying impact on the local economy. If fishermen spend twice as much as golfers and spend in industries having high multipliers, their impact on the local economy will be especially important.

The final stage of the research is to determine the impact of water quality on the behavior (demand) of these different tourist groups.

Summary

It is difficult, based solely on the completed research, to estimate the importance of water quality in its various dimensions to the Door County tourist industry and local economy. It is clear, however, that tourism is important economically to the county, generating more than \$28 million in annual economic activity. If subsequent research determines that deterioration of the quality of Lake Michigan and Green Bay waters would, for example, reduce the tourist trade by 50 percent, this would represent a \$14 million annual economic loss to the county. Such a potential loss would surely stimulate the investment of considerable sums to protect the quality of these waters.

The short example drawn above is simplified, failing to consider water quality impacts on other industries, the cost of capital for water resource management programs, etc., but until the subsequent research is complete, further discussion would be merely speculation.

The present study has shown the practicality of using input-output analysis as a tool for evaluating the economic impact of recreation on a local economy. The static input-output tables developed in this study required approximately \$20,000 of financing. If other local areas should desire to develop such tables, the cost should be spread among the many groups that would benefit from the knowledge rather than be supported solely by resource management agencies.

APPENDIX A

CLASSIFICATIONS USED IN THE INPUT-OUTPUT TABLES

APPENDIX A

CLASSIFICATIONS USED IN THE INPUT-OUTPUT TABLES

1. Agriculture, Forestry, Fisheries, Mining

SIC Divisions A and B (Agricultural production; agricultural services and hunting and trapping; forestry; fisheries; metal mining; anthracite mining; bituminous coal and lignite mining; crude petroleum and natural gas; mining and quarrying of nonmetallic minerals, except fuels).

2. Contract Construction

SIC Division C (Building construction--general contractors; construction other than building--general contractors; construction--special trade contractors).

3. Manufacturing

SIC Division D (Ordnance and accessories; food and kindred products; tobacco manufacturers; textile mill products; apparel and other finished products made from fabrics and similar materials; lumber and wood products, except furniture; furniture and fixtures; paper and allied products; printing, publishing, and allied industries; chemicals and allied products; petroleum refining and related industries; rubber and miscellaneous plastics products; leather and leather products; stone, clay, glass, and concrete products; primary metal industries; fabricated metal products, except ordnance, machinery, and transportation equipment; machinery, except electrical; electrical machinery, equipment and supplies; transportation equipment; professional, scientific, and controlling instruments, photographic and optical goods, watches, and clocks; miscellaneous manufacturing industries).

4. Transportation, Communication, Electric, Gas, and Sanitary Services

SIC Division E (Railroad transportation; local and suburban transit and interurban passenger transportation; motor freight transportation and warehousing; water transportation; air transportation; pipeline transportation; transportation services; communication; electric, gas, and sanitary services).

5. Wholesale Trade

SIC Division F, Major Group 50 (Wholesale trade).

6. Building Materials, Hardware, and Farm Equipment Dealers
SIC Division F, Major Group 52
7. Personal and Business Services

SIC Division H, Major Group 72 (Laundries, laundry services, and cleaning and dyeing plants; photographic studios, including commercial photography; beauty shops; barber shops; shoe repair shops, shoe shine parlors, and hat cleaning shops; funeral service and crematories; garment pressing, alteration, and repair; and miscellaneous personal services).

SIC Division G, Major Groups 73, 76, 80, 81, 82 (Miscellaneous business services, miscellaneous repair services; medical and other health services, legal services, educational services (except governmental)).
8. Finance, Insurance, and Real Estate

SIC Division G (Banking; credit agencies other than banks; security and commodity brokers, dealers, exchanges, and services; insurance carriers; insurance agents, brokers, and service; real estate; combinations of real estate, insurance, loans, law offices; holding and other investment companies).
9. Retail Trade, General Merchandise

SIC Division F, Major Group 53 (Department stores; mail order houses; variety stores; merchandising machine operators; direct selling establishments, e.g. dairy, bakery, etc.; miscellaneous general merchandise stores).
10. Food Stores

SIC Division F, Major Group 54
11. Automobile Sales and Service

SIC Division F, Major Group 55; SIC Division H, Major Group 75 (Automotive dealers; gas and service stations; auto repair and services; garages).
12. Apparel and Accessory Stores

SIC Division F, Major Group 56

13. Furniture, Home Furnishings, and Equipment Stores

SIC Division F, Major Group 57

14. Eating and Drinking Places

SIC Division F, Major Group 58

15. Miscellaneous Retail Stores

SIC Division F, Major Group 59 (Drug and proprietary stores; liquor stores; antique stores and secondhand stores; book and stationery stores; sporting goods stores and bicycle shops; farm and garden supply stores; jewelry stores; fuel and ice dealers; florists, cigar stores and stands, news dealers and newsstands, hobby, toy, and game shops, camera and photographic stores, gift shops).

16. Hotels, Rooming Houses, Camps, and Other Lodging Places, Resorts

SIC Division G, Major Group 70

17. Motion Pictures, Amusement and Recreation Services, Museums, Art Galleries, Zoos

SIC Division G, Major Groups 78 and 79; also Major Group 84 (Motion picture theaters; bowling alleys and billiard and pool establishments, professional sports clubs, public golf courses, amusement parks, private golf clubs, etc.).

18. Local Government

We are considering this to be an industry supplying services to households and other industries. Sales will consist of all receipts destined for use by municipal government. Receipts of municipal or county utilities or other businesses, including the highway department, will appear in other sections.

19. Local Households

This demand sector will also be considered as an industry. It includes salaries, wages, rents, and profits.

APPENDIX B
SURVEY INSTRUMENTS

APPENDIX B

The University of Wisconsin
BUREAU OF BUSINESS RESEARCH AND SERVICE
GRADUATE SCHOOL OF BUSINESS

AREA CODE 608-262-1550
1155 OBSERVATORY DRIVE
MADISON, WISCONSIN 53706

January 30, 1970

Dear Sir;

In the near future you will be receiving a mail questionnaire from the Bureau of Business Research and Service of the University of Wisconsin. A major purpose of the Bureau is to conduct business and economic research in the state. Studies are made available to interested Wisconsin residents without charge.

The mail questionnaire is part of a research program being conducted by the Green Bay, Madison and Milwaukee campuses of the University with the cooperation of the Door County Chamber of Commerce. Our goal is to gather information which may be used to assist Door County businessmen in a practical manner and to serve as a guide for the allocation of state funds for economic development.

The first phase of the program consisted of personal interviews of tourists who visited Door County during the summer of 1969. These interviews provided information about the expenditure patterns of visitors to the county in addition to other pertinent information which will be of use to Door County businessmen. The results are now being analysed and a report will be made available to all interested parties this spring.

The second phase of the program is now under way and we request your cooperation in order to arrive at a successful completion of the entire research effort. The questionnaire which you will soon receive in the mail is short and is designed to require only a minimum of your valuable time. We fully guarantee that all information on the questionnaire will be kept strictly confidential. Please do not identify yourself or the name of your business on the questionnaire.

We hope you will give the questionnaire your serious thought and return it at your earliest convenience. Thank you for your cooperation.

Sincerely,

William A. Strang
Program Director

WAS:aeh

The University of Wisconsin
BUREAU OF BUSINESS RESEARCH AND SERVICE
GRADUATE SCHOOL OF BUSINESS

AREA CODE 608-262-1550
1165 OBSERVATORY DRIVE
MADISON, WISCONSIN 53706

January 30, 1970

DOOR COUNTY RESEARCH PROGRAM

Objectives

- (1) To trace the flow of tourist dollars as they enter and move through the Door County community economic system.
- (2) To gather information which may be used to assist Door County businessmen in a practical manner.

Uses for Information Gathered

- (1) To determine the impact which tourist dollars have on the revenues and profits of all types of business activity in Door County.
- (2) To determine the manner in which private and public promotional efforts can be made more profitable in terms of increased tourist revenues per promotional dollar spent.
- (3) To measure the extent of the interrelationship between tourist related businesses and other business activity in Door County traditionally not directly associated with tourism. For example: What portion of the revenues and profits of nontourist related business activity is attracted to Door County as a result of the presence of the tourist industry? The answer to this question may have state-wide implications.
- (4) To provide assistance to government planners in their effort to allocate public funds and resources flowing into Door County in a manner which will maximize the benefits to residents and visitors to the county.

The University of Wisconsin
BUREAU OF BUSINESS RESEARCH AND SERVICE
GRADUATE SCHOOL OF BUSINESS

AREA CODE 608-262-1550
1155 OBSERVATORY DRIVE
MADISON, WISCONSIN 53706

February 10, 1970

Dear Sir:

Enclosed is a questionnaire which is part of a research program being conducted by the Green Bay, Madison, and Milwaukee campuses of the University of Wisconsin with the cooperation of the Door County Chamber of Commerce. The purpose of this program is to gather information which may be used to assist Door County businessmen in a practical manner and to serve as a guide for the allocation of state funds for economic development.

If this research program is to attain its objectives, it is essential that all types of businesses participate in this survey. All businesses, regardless of size or type of activity, contribute to the wealth of the Door County economy and therefore all are important to the community as a whole.

On February 2, questionnaires were mailed to you and approximately 450 other Door County businessmen. If you have already returned the questionnaire, we would like to thank you for your cooperation in this program. If you have not returned the questionnaire, we hope you will do so at your convenience. Perhaps you have misplaced or discarded the original questionnaire. We are therefore enclosing another copy for your convenience.

The enclosed questionnaire is brief and is designed to require only a minimum of your valuable time. Your cooperation is requested in answering the questions as completely and accurately as possible. However, in all cases your best estimates will be appreciated. We fully guarantee that the information which you provide will be kept strictly confidential. Only three members of our staff are authorized to see the questionnaires which are not allowed to be removed from our office. Furthermore, we request that you do not identify yourself or the name of your business on the questionnaire.

For the sake of brevity, only essential questions have been included in the questionnaire. However, question 5b (Purchases Table) on the second page of the questionnaire, is of particular importance to a successful completion of the research program. Please fill in this table as completely as possible and make estimates whenever necessary.

We hope you will give the questionnaire your serious thought and return it at your earliest convenience in the prepaid envelope. Please take this opportunity to allow your University system to work for you. Thank you for your cooperation.

Sincerely,

William A. Strang
Program Director

Confidential--For Authorized Personnel Only

SURVEY OF DOOR COUNTY BUSINESSMEN

Bureau of Business Research and Service
University of Wisconsin
Madison, Wisconsin

INSTRUCTIONS: This questionnaire contains ten questions and a purchases table which you are requested to complete. Much of the information requested is directly available in your 1968 federal or state tax returns (for your business). You may wish to use them to guide your answers. In all cases, your best estimates will be appreciated.

1. Please indicate your type of business (for example: retail grocery, wholesale hardware, bowling alley, resort, hotel, motel, restaurant, bar or tavern, manufacturer, bank, etc.).

-
2. Please indicate the organizational form of your business.

1. Proprietorship _____
2. Partnership _____
3. Corporation _____

3. Please estimate your 1968 gross sales of this business establishment. \$ _____.

4. Please estimate the dollar amount or percentage of your 1968 sales made to each of the following groups. We realize this may appear to be difficult for some firms. Your best judgment will be very useful.

Private individuals \$ _____ or _____ %

Governments \$ _____ or _____ %

Business and Other
Private Organizations \$ _____ or _____ %

- 4a. Of your 1968 sales to Private Individuals, what percentage was made to:

Door County Residents _____ %

Non-residents (of Door County) _____ %

- 4b. Of your 1968 sales to Governments, what percentage was made to:

Door County Government and
Municipalities in the county _____ %

Governments outside Door
County _____ %

- 4c. Of your 1968 sales to Business and other Private Organizations, what percentage was made to organizations located in:

Door County _____ %

Out of Door County _____ %

5. a. Please indicate the approximate cost of the materials, parts, supplies, and services your business purchased from supplier industries during 1968. Typical supplier industries are listed in the table below. Do not include purchases of capital assets which your business depreciates for tax purposes.

\$ _____

b. In the table below we have listed various types of supplier industries from which you may purchase materials, parts, supplies, and services. Note that each supplier category has been subdivided to distinguish between suppliers located within Door County and those who are located outside Door County.

In order to complete the table, please choose those categories of supplier industries which provide goods and services to your business. Then allocate the dollar amount spent during 1968 in each category according to whether or not the supplier is located within Door County. Do not include purchases of capital assets which your business depreciates for tax purposes.

Note: The total of the individual table entries should be approximately equal to the amount shown as the answer to Question 4a.

Purchases Table

Supplying Industries Brief Description	1968	
	Dollar Purchases (to nearest \$100) From Door County Suppliers	Dollar Purchases (to nearest \$100) From Suppliers Outside Door County
Agriculture, Forestry, & Fisheries		
Manufacturers		
Transportation, Communication, & Utility Services		
Building Material & Farm Equipment Retailers		
Wholesalers		
General Mdse. Retailers (dept. stores, variety stores, mail order, etc.)		
Food Retailers		
Apparel and Accessory Retailers		
Furniture and Home Furnishings Retailers		
Eating and Drinking Places		
Other Retail Stores (drug, liquor, sporting goods, fuel & ice, florists, gift & novelty, etc.)		
Automobile Dealers, Service Stations, Car Rentals, and Auto Repair		
Financial Agencies (indicate interest & service charges)		

continued

Insurance Agencies		
Real Estate Agencies (commissions & fees)		
Advertising Services		
Other Business Services (laundry, maintenance, misc. repairs, medical, legal, educational, and other professional services)		
Others		

6. Please indicate the total amount paid for salary and wages during 1968:

\$ _____

Please assign a percentage of the total paid to:
Employees, including seasonal help,
who live in Door County while working _____ %

Employees who commute to work on a
daily basis from homes outside Door
County _____ %
100

7. Please indicate the total amount paid during 1968 for rent on business property:

\$ _____

Please assign a percentage of the
total paid to landlords located:

In Door County _____ %
Outside Door County _____ %

8. Please indicate the amount paid during 1968 for taxes on business income and business property:

Property taxes \$ _____

State income taxes \$ _____

Federal income taxes \$ _____

Other taxes or license fees:

a. _____ \$ _____

b. _____ \$ _____

c. _____ \$ _____

9. Please indicate the amount spent during 1968 on new construction or building improvements (which you depreciate) which was paid to contractors located:

In Door County \$ _____

Outside Door County \$ _____

10. Please indicate the amount spent during 1968 for new machinery and equipment (which you depreciate) purchased from a manufacturer or dealer located:

In Door County \$ _____

Outside Door County \$ _____

THANK YOU FOR YOUR COOPERATION

APPENDIX C
COMPUTER PROGRAM

APPENDIX C

```
C THIS PROGRAM COMPUTES 1. INPUT COEFFICIENT MATRIX AND
C 2. LEONTIEF'S INVERSE COEFFICIENT MATRIX
C
DIMENSION B(22,23), C(22,23), A(19,19)
DIMENSION RI(19,19), P(19,19), INV(19,19)
NI = 22
NJ = 23
NIO = 19
1 FORMAT(5X, '*****')
1*****')
2 FORMAT(1H1)
3 FORMAT(//)
4 FORMAT(5X, ' TRANSACTION MATRIX ')
5 FORMAT(5X, ' C MATRIX ')
6 FORMAT(5X, ' INPUT COEFFICIENT MATRIX ')
7 FORMAT(5X, ' INVERSE COEFFICIENT MATRIX ')
8 FORMAT(5X, ' SHOULD BE CLOSE TO IDENTITY MATRIX ')
   DEFINE MATRICES
CALL MTAMDF(B,NI,NJ,'S',NI,NJ,'GEN')
CALL MTAMDF(A,NIO,NIO,'S',NIO,NIO,'GEN')
CALL MTAMDF(C,NI,NJ,'S',NI,NJ,'GEN')
CALL MTAMDF(RI,NIO,NIO,'S',NIO,NIO,'DIA')
CALL MTAMDF(P,NIO,NIO,'S',NIO,NIO,'GEN')
CALL MTAMDF(INV,NIO,NIO,'S',NIO,NIO,'GEN')
   CREATE AN IDENTITY MATRIX
CALL MTCNST (RI,1.0,'S')
   READ-IN MONEY TRANSACTIONS
CALL MTREAD( B, '( 8F10.)')
PRINT 2
PRINT 1
PRINT 4
PRINT 3
```

```

C      CALL MTPRNT( B , '(16F8.0)')
      DEVELOPE INPUT (TECHNICAL) COEFFICIENTS
DO 100 J= 1 , NJ
BNIJ=B(NI,J)
DO 100 I= 1 , NI
100 C(I,J) = B(I,J) /BNIJ
PRINT 2
PRINT 1
PRINT 5
PRINT 3
C      CALL MTPRNT( C , '(16F8.5)')
      DEFINE TECHNICAL COEFFICIENTS FOR PROCESS SECTOR
DO 200 I= 1 , NIO
DO 200 J= 1 , NIO
200 A(I,J) = C(I,J)
PRINT 2
PRINT 1
PRINT 6
PRINT 3
C      CALL MTPRNT( A , '(6E18.8)')
      CALCULATE P = (I-A) MATRIX
CALL MTSUB (RI,A,P)
      CALCULATE DIRECT AND INDIRECT COEFFICIENTS BY
      INVERTING (I-A) MATRIX
CALL MTINV(P,INV,1.E-06,$300)
PRINT 2
PRINT 1
PRINT 7
PRINT 3
C      CALL MTPRNT( INV , '(6E18.8)')
      FOLLOWING STATEMENT PUNCHES THE INVERSE COEFFICIENT
      VALUES ON CARDS.  REMEMBER TO PICK UP THESE PUNCHED
      CARDS OUTPUT FROM THE DESK TO FEED INTO PROG2
DO 500 I=1,NIO
500 WRITE(1,999) (INV(I,J),J=1,NIO)
999 FORMAT(7E11.5)

```

```
C          CHECK THE ACCURACY OF INVERSE MATRIX
C          BY MULTIPLYING (I-A)-1 * (I-A) = I
          CALL MTMPY(INV,P,RI)
          PRINT 2
          PRINT 1
          PRINT 8
          PRINT 3
          CALL MTPRNT(RI, '(11F11.6)')
          PRINT 1
          PRINT 1
          GO TO 400
300 PRINT 301
301 FORMAT(//,10X, 'CONVERGENCE FAILURE')
400 STOP
          END
          'XQT
```

SELECTED BIBLIOGRAPHY

1. Allen, Robert Loring and Watson, Donald A. The Structure of the Oregon Economy: An Input-Output Study. A Report Prepared by Bureau of Business and Economic Research. Eugene, Oregon: University of Oregon, 1965.
2. Almon, Clopper, Jr., The American Economy to 1975, Harper & Row (49 East 33rd St., New York 10016), 1966.
3. Almon, Clopper, Jr., "Consistent Forecasting in a Dynamic Multi-Sector Model," The Review of Economics and Statistics, XLV (May, 1963), 148-62.
4. Almon, Clopper, Jr., "Numerical Solution of a Modified Leontief Dynamic System for Consistent Forecasting or Indicative Planning," Econometrica, XXXI (October 1963), 665-78.
5. Barna, Tibor. (ed), The Structural Interdependence of the Economy, Proceedings of an International Conference on Input-Output Analysis, (New York and Milan: John Wiley & Sons, Inc., and A. Giuffre, 1956).
6. Barna, Tibor. (ed), Structural Interdependence and Economic Development, Proceedings of an International Conference on Input-Output Techniques, Geneva, September 1961 (New York; St. Martin's Press, 1963).
7. Blake, C., and S. McDowall, "A Local Input-Output Table," Scottish Journal of Political Economics. November, 1967, 14(3), pp. 227-42.
8. Bourque, Philip J., et al., The Washington Economy: An Input-Output Study. Graduate School of Business Administration. Washington: The University of Washington, 1967.
9. Cameron, Burgess, Input-Output Analysis and Resource Allocation, New York: Cambridge University Press, 1968.
10. Canning, Richard G., "The Growing Use of Input-Output Model," EDP Analyzer, Vista, California; Canning Publications, Inc., Vol. 7, No. 7, (July, 1969).

11. Carter, Anne P. "Incremental Flow Coefficients for a Dynamic Input-Output Model with Changing Technology," in Tibor Barna (ed) Structural Interdependence and Economic Development, proceedings of an International Conference on Input-Output Techniques, Geneva, September, 1961 (New York: St. Martin's Press, 1963), pages 276-302.
12. Chenery, Hollis B., and Paul G. Clark. Interindustry Economics, New York: John Wiley & Sons, Inc., 1959.
13. Chu, Kong, Principles of Econometrics, Scranton, Pennsylvania: International Textbook Company, 1968.
14. Chudgar, Ashvin J., A Mathematical Model of the Input-Output Structure of the Fresno County Economy, Bureau of Business Research and Service. Fresno, California: Fresno State College, August, 1966.
15. Conference on Research in Income and Wealth, Input-Output Analysis: An Appraisal, A Report of the National Bureau of Economic Research, ("Studies in Income and Wealth," No. 18). Princeton, N.J.: Princeton University Press, 1955.
16. Council of Planning Librarians. Regional Development and Economic Growth: The Problem Background, Exchange Bibliography, #115. (Ottawa: Canadian Department of Regional Economic Expansion, February, 1970).
17. Council of Planning Librarians. Regional Development and Economic Growth: Theory Analysis and Techniques, Exchange Bibliography #116.
18. Dorfman, Robert, "The Nature and Significance of Input-Output," The Review of Economics and Statistics, XXXVI (May 1954), 121-33.
19. Eilert, John W., A Profile and Economic Impact Analysis of Four Cumberland Gap Counties, Bureau of Business and Economic Research, Memphis State University, June, 1968.
20. Evans, W. Duane, "Marketing Uses of Input-Output Data," Journal of Marketing, July 1952, pages 11-21.
21. Evans, W. Duane, The Effect of Structural Matrix Errors on Input-Output Estimates, Bureau of Labor Statistics, October, 1952.

22. Evans, W. Duane, And Marvin Hoffenberg, "The Interindustry Relations Study for 1947, "The Review of Economics and Statistics, May, 1952, 97-142.
23. Farag, Shawki M., Input-Output Analysis: Application to Business Accounting. Urbana, Illinois: Centre for International Education and Research in Accounting, 1967.
24. Fisher, Walter D., "Criteria for Aggregation in Input-Output Analysis," The Review of Economics and Statistics, XL (August, 1958), 250-60.
25. Gols, A. George, "Input-Output for the Corporate Planner," a paper presented at a symposium on "Input-Output '69," Pittsburgh, Pennsylvania, December 2, 1969.
26. Gols, A. George, "Use of the 1963 Input-Output Table," presented at a symposium on The Practical Uses of the Detailed 1963 U.S. Input-Output Tables, New York, January 28, 1970.
27. Gols, A. George, President of Arther D. Little, Inc., Prospectus for the Growth Patterns of U.S. Industries in the Seventies: The 1969-70 Program, August, 1969.
28. Harmston, Floyd K. and Richard E. Lund, Application of an Input-Output Framework to a Community Economic System, Columbia: University of Missouri Press, 1967.
29. Hatanaka, Michio, The Workability of Input-Output Analysis, Germany: Fachrerlag Für Wirtschaftstheorie Und Okonmentrie, Ludwigshäfen Am Rhein, 1960.
30. Hawkins, David, and H.A. Simon, "Some Conditions of Macroeconomic Stability," Econometrica, 17 (July-October 1949), 245-48.
31. Holley, J.L., "Note on the Inversion of the Leontief Matrix," Econometrica, July 1951, pages 317-420.
32. Holley, J.L., "A Dynamic Model: 1. Principles of Model Structure," Econometrica, October 1952, pages 616-642.
33. Hubbell, J.P. and D.C. Ekey, "The Application of Input-Output Theory to Industrial Planning and Forecasting," Journal of Industrial Engineering, (345E. 47th St., New York 10017), January-February 1963, pp. 49-56.

34. Interindustry Bibliography, Office of Statistical Standards, Bureau of the Budget, February 17, 1953, and Supplement No. 1 to Interindustry Bibliography, Office of Statistical Standards, Bureau of the Budget, April 24, 1953.
35. Lee, Tong Hun, John R. Moore and David P. Lewis, A Report on the Tennessee Interindustry Study, Knoxville, Tennessee: Centre for Business and Economic Research, The University of Tennessee, December, 1967.
36. Leontief, Wassily W., et al. Studies in the Structure of the American Economy, New York: Oxford University Press, 1953.
37. Leontief, Wassily W., The Structure of Development, Reprinted from Scientific American, September 1963, California: W.H. Freeman & Company.
38. Miernyk, William H. The Elements of Input-Output Analysis. New York: Random House, 1965.
39. Miernyk, William H., et al., Impact of the Space Program on a Local Economy: An Input-Output Analysis, Morgantown: West Virginia University Library, 1967.
40. Moore, Frederick T., and James W. Petersen, "Regional Analysis: An Interindustry Model of Utah,": The Review of Economics and Statistics, XXXVII (November 1955), 368-83.
41. Naylor, Thomas H., "Simulation as a Planning Tool," Econometric System Simulation Program Working Paper No. 19, presented at a National Conference on the Economies of the States at Ohio State University, March 29, 1968.
42. New Mexico Business, "A Preview of the Input-Output Study," Vol. 18, No. 10. Bureau of Business Research New Mexico: University of New Mexico, October, 1965.
43. Sandoval, David A., "An Interindustry Study of the New Mexico Economy," New Mexico Business, Vol. 21, No. 5. Bureau of Business Research. New Mexico: University of New Mexico, May 1968.
44. Seitz, C. Ward, Jr., "A Dynamic Approach to Input-Output Forecasting," IBM Seminar on Operations Research, California, 1968. (paper)

45. Seitz, C. Ward, Jr., "The Use of Long-Range, Interindustry Forecasting For Diversification Planning," a paper presented at the American Chemical Society Input-Output Meeting, September, 1967.
46. Solow, Robert, "On the Structure of Linear Models," Econometrica, XX (January 1952), 29-46.
47. Taskier, Charlotte E. Input-Output Bibliography, 1960-1963, New York: United Nations, 1964.
48. Taskier, Charlotte E. Input-Output Bibliography, 1963-1966, New York: United Nations, 1967.
49. Theil, H., Economic Forecasts and Policy, 2nd Edition, Revised. Amsterdam, Holland: North-Holland Publishing Company, 1961.
50. Tiebout, Charles M., "Regional and Interregional Input-Output: An Appraisal," Southern Economic Journal, 24:140-47, (October, 1957).
51. U. S. Department of Commerce, Office of Business Economics, Survey of Current Business, Washington D.C., Government Printing Office, November, 1969, Volume 49, #11.
52. Yamada, Isamu, Theory & Application of Interindustry Analysis, Tokyo, Japan: Kinokuniya Book Store Company, Ltd., 1961.