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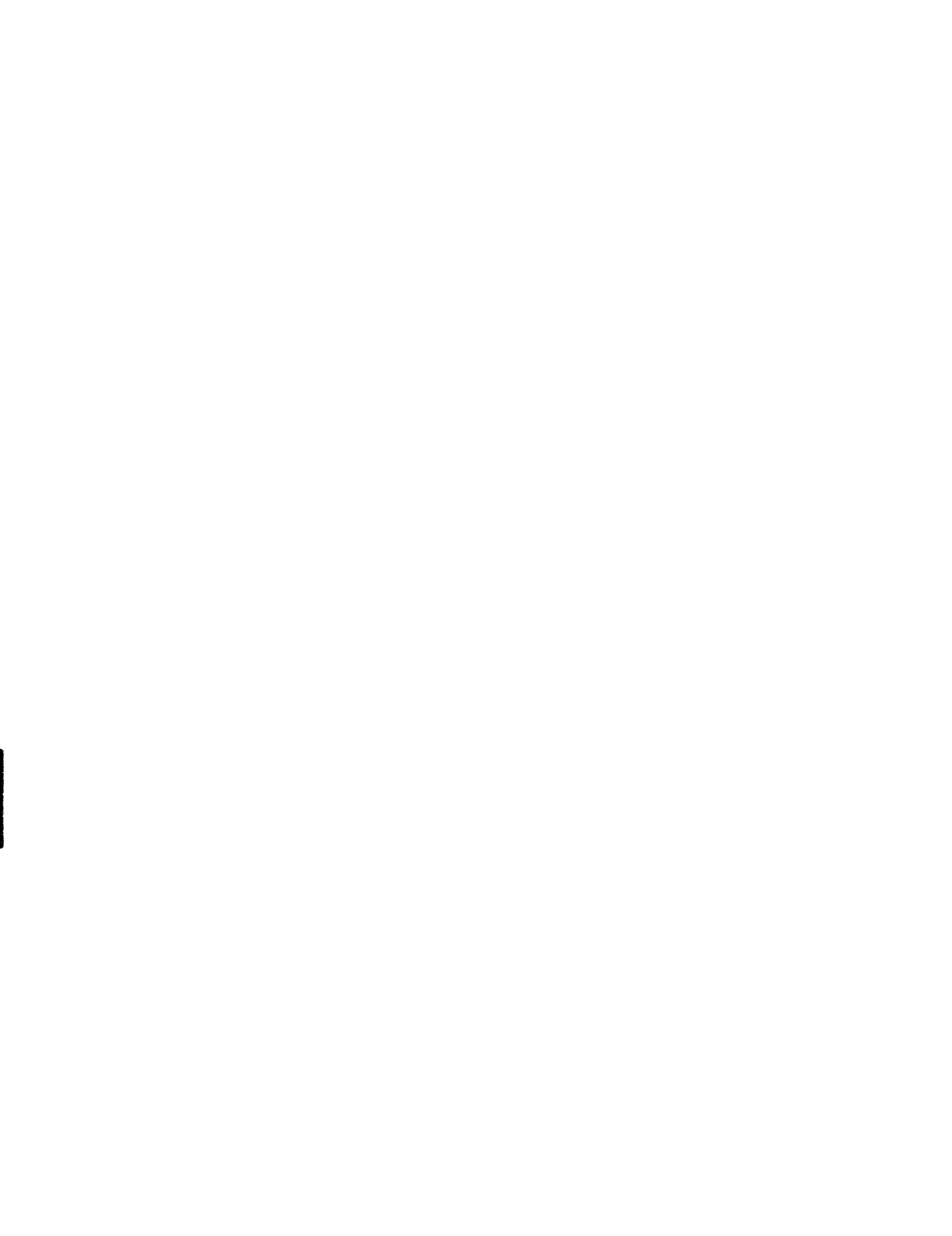
ECONOMIC IMPORTANCE OF EXPORT-
PRODUCING INDUSTRY IN MINNESOTA

Wilbur R. Maki, Peter L. Stenberg and Mason Chen



Department of Agricultural and Applied Economics

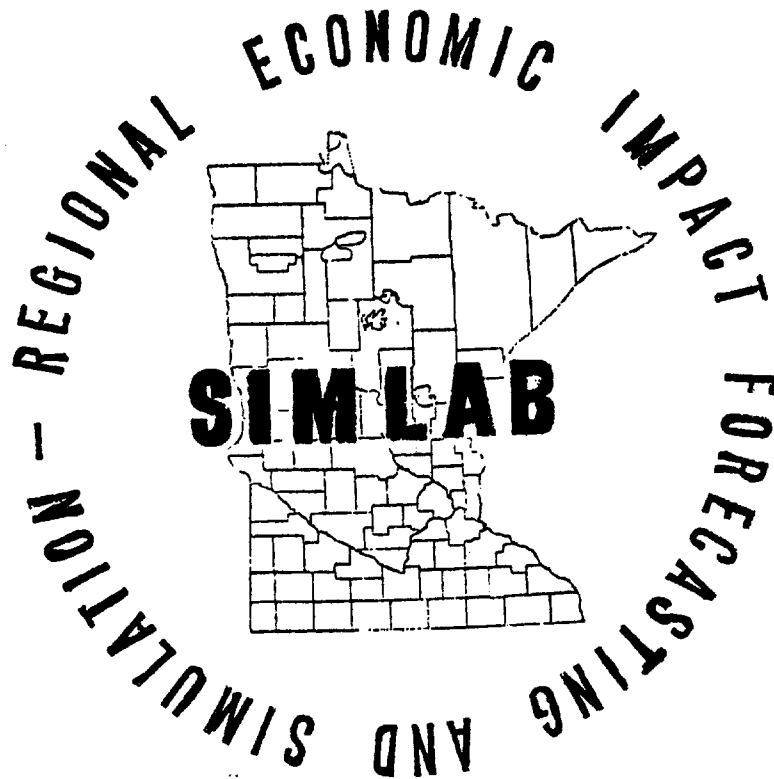
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Acknowledgements

Financial support of the Minnesota Agricultural Experiment Station is acknowledged. A special grant has made possible an updating and expansion of the 1970 Minnesota input-output computer model for use in studies of the economic importance of agriculture and agriculture-related industry in Minnesota.

Abstract

This report is the second in a series on interindustry and inter-regional relationships and their implications for the economy of Minnesota and its substate development regions. In this report, the role and importance of export-producing industries in Minnesota are discussed. Major emphasis is on agricultural-related industries and their economic importance to the State in value of gross output and contribution to gross state product.

Summary and Conclusions

Long-term regional viability and prosperity depends on a region's economic base -- its export-producing industry. In Minnesota, a wide range of industries contribute to this base by sales to out-of-state markets.

The economic importance of export-producing industry varies, depending upon the criterion of importance. In value of gross output agriculture and food products manufacturing -- both important in Minnesota's economic history -- accounted for 8.5 percent and 11.7 percent, respectively, of the State total in 1972. In value added, these percentages were even smaller -- 6.6 and 4.1. When measured by the value of exports, however, the two industries increased in importance, accounting for 7.2 percent and 29.4 percent, respectively, of the State total. Agriculture-related industry was, indeed an important recipient of income received from sources outside the State.

State economic effects of agriculture-related industry are represented by demand and supply multipliers, both short-term and long-term. Short-term demand multipliers for 19 agriculture-related industries range from 1.568 for other crop production to 2.869 for dairy products manufacturing, while short-term supply multipliers range from 1.411 for alcoholic beverages and soft drinks manufacturing to 3.127 for agriculture, forestry and fishery services. Size of multiplier is directly related to the forward and backward linkages of these industries in Minnesota -- the larger the internal, in-state linkage, the larger the multiplier.

Long-term multipliers are presented, also, to show long-term effects of changes in export demands. In this report, the long-term multipliers apply only to export-producing industries and they show, at best, certain upper limits of economic impact. They are much larger in value than the corresponding short-term multipliers.

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ECONOMIC IMPORTANCE OF EXPORT-PRODUCING
INDUSTRY IN MINNESOTA

Wilbur R. Maki, Peter A. Stenberg and Mason Chen

Export-producing industry represents the economic base of a state or region. It accounts for the dollar inflows which result from the sale of locally-produced goods and services to non-residents. In Minnesota, agriculture and food products manufacturing, forestry and wood and paper products manufacturing, mining and mineral products manufacturing, high technology manufacturing, high-order services, including corporate central offices, and tourism are part of its economic base. A wide range of industry outshipments thus originate in the Minnesota economy. They include raw materials, semi-finished products, and final products. The latter include the sale of goods and services to households, business and government in Minnesota and outside the State.

Study objectives

Findings of a study of the Minnesota economy -- its current status and economic future potential -- are reported here, in part. While the larger study objectives include forecasts of individual industry growth and change in the State, only the base-year findings are presented here. The base year for these studies is 1972 -- the latest year of comparable state and national data on individual industry sales, employment and earnings. All values are reported in 1972 dollars.

Specific study objectives included the following:

1. To prepare a series of input-output tables which show interindustry transactions and related output demands and input supplies;

2. To derive a series of input-output multipliers which show the effects of changes in demand for, and supply of, specified industry outputs;
3. To present a series of statistical indicators which show the economic importance of export-producing industry in Minnesota.

The third objective is addressed in this report.

Study approach

Study findings are presented here for the 1972 base year under three topical headings, namely, industry structure, export-producing industry and economic impact measurement. Industry structure refers to the level and distribution of industry sales in Minnesota. A 32-industry breakdown, which emphasizes agriculture and food products manufacturing, is used in presenting Minnesota industry comparisons (Table 1.1). A more detailed 214-industry breakdown was used initially in the compilation of individual topical presentations. Interindustry transactions, input purchases and output disbursements are presented in a single summary table under the first topic.

Export-producing industry and economic impact measurement are the remaining two topical presentations. Export-producing industry is found under each of five major industry groups -- agriculture and food products manufacturing, forestry and timber products manufacturing, mining and mineral products manufacturing, high technology manufacturing, and trade and service activities. The economic impact of changes in the demand for, and supply of, individual export-producing industry outputs are discussed under the last of the three topical headings.

Each of the 32 industries listed in Table 1.1 is identified in the

Table 1.1. Minnesota Standard Industrial Classification System Emphasizing Agriculture-Related Industry, 1972.

Industry No.	Industry Title	75- Ind.(A)	85- Ind.	214- Ind.	Standard Industrial Classification System (1972 Edition)
1.	Dairy Farm Prod.	1	pt.1	1	0241,pt.0191,pt.0259,pt.0291
2.	Poultry & Eggs	2	pt.1	2	025(exc.0254 & pt.0259),pt.0191,pt.0219,pt.0291
3.	Meat An. & Prod.	3	pt.1	3,4	021(exc.0219),027,pt.0191,pt.0259,pt.0291
4.	Food, Feed Gr.	4	pt.2	6,7	pt.011,pt.0191,pt.0192,pt.0219,pt.0291,pt.0259,pt.0139
5.	Vegetables	5	pt.2	12	0134,0161,pt.0119,pt.0139,pt.0191,pt.0219,pt.0259,pt.0291
6.	Sugar Crops	6	pt.2	13	0133,pt.0191,pt.0219,pt.0259,pt.0291
7.	Oil-Bearing	7	pt.2	15	0116,pt.0119,pt.013,pt.017,pt.0219,pt.0259,pt.0291
8.	Other Crops	8	pt.2	5,8-11,14,16,17	0131,pt.0191,pt.0219,pt.0259,pt.0291,0132,pt.0259,pt.017,0173,pt.0179,pt.0139,pt.018
9.	For.,Fish. Prod.	9	3	18	081-091,097
10.	Agr.,For.,Fish. Serv.	10	4	19	0254,071(exc.074),085,092
11.	Mining	11-14	5-10	20-26	10-14(exc.pt.108,pt.1112,pt.1213,pt.138,pt.148)
12.	Construction	15-16	11,12	27-33	15(exc.pt.1531)-17,pt.108,pt.1112,pt.1213,pt.138,pt.148
13.	Meat Products	18	pt.14	36-39	201
14.	Dairy Products	19	pt.14	40-44	202
15.	Fruit & Veg. Prod.	20	pt.14	45-47	203,2091,2092
16.	Grain Mill Prod.	21	pt.14	48-54	204
17.	Bakery Prod.	22	pt.14	55-56	205
18.	Sugar Prod.	23	pt.14	57-58	206
19.	Soybean, Veg. Oil	24	pt.14	64-66,68	207
20.	Alch.Bev.,Soft Dr.	25	pt.14	59-63	208
21.	Misc. Food.,Tob.	26	pt.14,15	67,69-71	209(exc.2091-2),21
22.	Chem. & Allied	36	27-30	98-105	28
23.	Petr. Ref. & Prod.	37	31	106-7	29
24.	Farm Mach.	44	44	134	352
25.	Other Mfg.	17,27-35,38-43,45-54	13,16-26,32-43,45-64	34-5,72-97,108-133,135-174	22-27,30-39(exc.352)
26.	Transportation	55-59	65	175-181	40-47(exc.pt.41,4311)
27.	Comm., Utilities	60-63	66-68	182-186	48,49(exc.pt.491)
28.	Wh. & Ret. Trade	64-65	69	187-88,200	50-59,pt.70,7396,pt.8042
29.	Fin.,Ins.,Real Est.	66-67	70,71	189-193	60-69(exc.613),pt.1531
30.	Services, Private	68-72	72-77	194-9,201-9	70-89(exc.pt.70,7396,pt.8042),074
31.	Govern. Enterpr.	73-4	78-9	201-3	4311,pt.41,pt.491,pt.613
32.	Scrap, Sec. & Used	75	81	214	---
33.	Subtotals	1-75	1-81	1-214	01-89

Rows:

- 34. Proprietorial Income
- 35. Wage & Sal. Payments
- 36. Other Empl. Comp.
- 37. Other Prop.-Type Inc.
- 38. Indirect Bus. Tax
- 39. Value Added, Total

Columns:

- 40. Noncomp. Import
- 41. Imports RON
- 42. Gross Outlay
- Columns:
- 34. Pers. Cons. Exp.

- 35. Grs. Priv. Cap. Form.
- 36. Chg. Bus. Inven.
- 37. Allocated Exports
- 38. Allocated Imports
- 39. Fed. Gov. Purch.
- 40. State-Local Purch.
- 41. Exports RON

corresponding industry group in three related industry classification systems -- the 75-industry listing for the Minnesota Regional Development Simulation Laboratory (SIMLAB), the 85-industry listing in U.S. Department of Commerce reports on the 1972 U.S. input-output tables, and the 214-industry breakdown for the Minnesota Two-Region Input-Output (TRIO) Computer Model (2 , 5 , 1). The 214-industry listing will be available in a forthcoming report on the Minnesota economy.

Industry Structure

Industry structure is represented by the distribution of 1972 Minnesota industry output, purchases and disbursements (Appendix Table 1.1). Industry differences occur in each of the three categories, especially in industry output levels, which range from \$5.2 million of forest and fishery products to \$8.7 billion of other manufacturing. All output is measured in producer value. However, gross margins, rather than resale value, is used in the wholesale and retail trade sector. Indeed, the value of all noncommodity industry outputs, except for the utility industry (part Ind. No. 27), is represented by the value of gross margins. In contrast to the non-commodity-producing industries, "double-counting" of inputs and outputs occurs in the commodity-producing industry groups (No. 1 to No. 26).

Gross output

The 1972 industry gross output value of \$38 billion includes all market-based activity. This excludes, of course, the output value of government and household industry, except for government enterprise (e.g., post office, mass transit, water and sewer). Other private trade and service enterprise nonetheless accounted for nearly one-half of this total.

The 1972 output value for major industry groups (in 1972 dollars) are summarized as follows:

<u>Industry Group</u>	<u>Total</u> (mil. \$)	<u>Prop. of All Ind.</u> (%)
Agriculture	3,280	8.5
Mining	666	1.7
Construction	2,965	7.7
Food prod. mfg.	4,501	11.7
Other mfg. and scrap	8,899	23.0
Trade and service	18,312	47.4
All Industry	38,622	100.0

Thus, agriculture and food products manufacturing accounted for more than \$7.8 billion of the total, while mining, construction and other manufacturing accounted for \$12.5 billion. Altogether, the commodity-producing industries accounted for \$20.3 billion, or 52.6 percent, of the total value of market-based industry gross output.

Input purchases

Input purchases of the 32-producing industries in Minnesota are from three major categories -- intermediate purchases from producing industries in Minnesota, primary input purchases from resource owners (for value added by labor and capital) in Minnesota, and imports of intermediate goods from producing industries in rest of nation. In 1972, the two categories of intermediate purchases accounted for 51.4 percent of total Minnesota industry purchases while the primary input purchases accounted for 48.6 percent of the total.

Input purchases of the six industry groups listed earlier vary from

among industry groups and input categories, as follows (from Table 1.1, ref.3):

<u>Industry Group</u>	<u>Intermediate</u>		<u>Value Added</u>		<u>Imports</u>	
	<u>Total</u> (mil.\$)	<u>Prop. of All Ind.</u> (%)	<u>Total</u> (mil.\$)	<u>Prop. of All Ind.</u> (%)	<u>Total</u> (mil.\$)	<u>Prop. of All Ind.</u> (%)
Agriculture	1,651	10.8	1,236	6.6	393	8.6
Mining	275	1.8	276	1.5	116	2.6
Construction	1,228	8.0	1,360	7.2	378	8.3
Food prod. mfg.	3,184	20.8	778	4.1	540	11.9
Other mfg. and scrap	3,597	23.5	3,518	18.8	1,758	38.6
Trade and services	5,377	35.1	1,595	61.8	1,363	30.0
All industry	15,312	100.0	18,763	100.0	4,548	100.0

Agriculture and food products manufacturing accounted for 31.6 percent of total intermediate purchases, 10.7 percent of total value added, and 20.5 percent of total imports in 1972 while other manufacturing accounted for 23.5 percent, 18.8 percent and 38.6 percent, respectively of the three totals.^{1/} Agriculture-related industry exceeded other manufacturing only in intermediate purchases. Only the trade and service sector had larger intermediate purchases than the agriculture-related sectors. Value added by agriculture-related industry was small, however, when compared with value added by other manufacturing and other industry.

Agriculture-related industry in Minnesota is characterized by its linkages to Minnesota input-supplying industries. It accounts for nearly a third of the total intermediate purchases from Minnesota industries,

^{1/} Small differences occur between the summary data from Table 1.1 in ref. 3 and Appendix Table 1.1 because of treatment of Minnesota allocated share of U.S. noncomparable imports. These differences are nominal and do not affect study findings.

sectors. The trade and service sector alone accounts for nearly two-thirds of total value added by the market-based industries in Minnesota.

Output disbursements

Output disbursements of a producing industry include production inputs and final products. The latter includes exports to other industries in rest of nation.

Intermediate sales and purchases for all industries balance, as shown in Appendix Table 1.1. For individual industries and industry groups, sales are likely to be more or less than purchases. In the agriculture-related industries, for example, total intermediate sales are much smaller than total intermediate purchases -- \$3.9 billion of sales as compared with \$4.8 billion of purchases.

The distribution of output disbursements among purchasing sectors is summarized as follows (from Table 1.1, ref. 3):

<u>Industry Group</u>	<u>Intermediate</u>		<u>Final Local</u>		<u>Exports</u>	
	<u>Total</u> (mil.\$)	<u>Prop. of All Ind.</u> (%)	<u>Total</u> (mil.\$)	<u>Prop. of All Ind.</u> (%)	<u>Total</u> (mil.\$)	<u>Prop. of All Ind.</u> (%)
Agriculture	2,615	17.1	144	0.9	522	7.2
Mining	75	0.5	31	0.2	561	7.8
Construction	475	3.1	2,460	16.1	31	0.4
Food prod. mfg.	1,288	8.4	1,086	7.1	2,127	29.4
Other mfg. and scrap	3,883	25.3	2,636	17.2	353	32.6
Trade and service	<u>6,976</u>	<u>45.6</u>	<u>9,727</u>	<u>63.5</u>	<u>1,633</u>	<u>22.6</u>
All industry	15,312	100.0	16,084	100.0	7,227	100.0

Agriculture-related industries accounted for 25.5 percent of all industry disbursements to producing sectors, 8 percent of all industry disbursements to local final demand sectors, and 36.6 percent of all industry disbursements to rest-of-nation markets. Like value added, the final product contribution of agriculture-related industry is small relative to other Minnesota industries.

The level and distribution of input purchases and of output disbursements are two measures of the economic importance of all industry in Minnesota. The net contribution of all industry to the Minnesota gross state product is represented by total value added, including value added by government. The value added equals the value of final local purchases and net exports (i.e., total exports-total imports). In 1972, total value added by market-based industry was \$18,763,000, which is equal to its final product as shown below:

<u>Product and Income Accounts</u>	<u>Total</u> (mil.\$)	<u>Prop. of All Val. Add.</u> (%)
Value added, total	20,864	100.0
market-based	18,763	89.0
Government	2,101	10.1
Final product, total	18,763	89.9
Local	15,859	76.0
Exports	7,183	34.4
Imports	4,279	20.5

By including value added by government, this total increases to \$20.9 billion, which approximates the gross state product. Market-based activity thus accounted for slightly less than 90 percent of the gross state product in 1972.

Industry exports exceed industry imports of intermediate inputs by approximately \$2.9 billion. Impacts of intermediate inputs by approximately \$2.9 billion. Impacts of final demand sectors were nearly \$3.2 billion. Net

inflows thus exceeded net outflows by nearly \$0.3 billion.

Export-Producing Industry

The five industry clusters cited earlier -- agriculture and food products manufacturing, forestry and timber products-manufacturing, mining, and mineral products manufacturing, high technology manufacturing, and trade and service activities -- are identified as the principal export-producing industries in the State. The economic importance of these activities is demonstrated by a detailed examination of the role and impact of agriculture-related exports on input-supplying and output-purchasing industries.

Agriculture

Exports to rest of nation are shown for six of the 10 agricultural industries in Appendix Table 1.1. For the U.S., exports exceed imports in the products of four of the 10 industries while in another four of the ten industries, exports are less than imports. Minnesota exports to rest of nation are added to the net U.S. competitive exports (which are allocated to Minnesota) in the estimates of total exports from Minnesota industries.

Exports to rest of nation are compared with imports from corresponding industries in rest of nation. Here, exports to rest of nation are shown as excess supply while imports are shown as deficit supply. Initially, a 214-industry, rather than a 32-industry, breakdown was used in deriving the excess and deficit supply estimates. With the consolidation of industry groups, an aggregate industry group in the State may be shown with both an excess supply and a deficit supply of output. Thus, while \$32.8 million of outshipments are shown for Ind. No. 3, \$404.2 million of inshipments are shown, also, because of the aggregation of two industry groups (meat animals and other livestock) into the one industry group. The export and import totals are summarized of the nine industry groups and summarized as follows (Table 1.2, ref. 3);

<u>Industry</u>	<u>Excess Supply</u>		<u>Deficit Supply</u>	
	<u>Total</u> (mil.\$)	<u>Prop. of</u> <u>Gr. Out.</u> (%)	<u>Total</u> (mil.\$)	<u>Prop. of</u> <u>Tot. Req.</u> (%)
Dairy farm	96.3	191.1	0	0
Poul., eggs	0	0	1	0.8
Meat An.	32.8	2.6	404.2	24.9
Food, Feed	208.5	23.6	45.8	6.3
Vegetables	0	0	14.4	18.9
Sugar crop	21.8	71.8	0	0
Oil-Bearing	101.9	32.3	0	0
Other Crop	1.3	4.5	90.4	75.8
For., Fish	0	0	62.6	92.3
Agr., For.	0	0	37.5	35.9
Total	462.6	14.1	656.0	18.9

Each agricultural industry also imports a variety of inputs from rest of nation industries, as shown in Appendix Table 1.1. These imports are compared with the exports of the same industries, as follows:

<u>Industry</u>	<u>Imports</u>		<u>Net</u> <u>Transfer</u> (mil. \$)	<u>Excess Supply</u> <u>as Proportion</u> <u>of Total</u> (%)
	<u>Total</u> (mil.\$)	<u>Prop. of</u> <u>Gr. Out.</u> (%)		
Dairy farm	31.1	6.2	65.2	1.4
Poul., eggs	19.6	14.9	-19.3	-
Meat an.	161.1	12.9	-130.1	0.5
Food, Feed	127.9	14.4	231.6	3.0
Vegetables	6.6	10.7	- 7.8	0
Sugar crop	4.8	15.8	16.9	0.3
Oil-bearing	30.6	9.7	98.7	1.5
Other crop	3.2	10.6	-2.3	0
For., Fish.	0.5	9.6	-1.9	0
Agr., For.	7.9	11.8	-7.9	0
Total	393.3	12.0	243.1	6.7

Imports exceed exports for six of the industries. The meat animals industry is shown with the largest excess of imports over exports (with its net transfer of -\$130.1 million). These imports represent largely the purchases of feeder cattle from farms and ranches outside Minnesota. On the other hand, the food and feed grain industry has the largest excess of exports over imports, which represent, of course, the outshipment of wheat, corn and other small grains to rest-of-nation markets.

Feed and food grains and soybeans are the principal exports of Minnesota agriculture. They amount to 4.5 percent of all industry exports to rest of nation markets. Dairy farms also are shown as large exporters. For this industry, however, the estimate probably exaggerates actual exports because of an apparant underestimation of the volume of fluid milk processing in Minnesota. If the estimated level of exports were reduced for dairy farms, a corresponding increase in exports would be indicated for dairy processing plants. Total agricultural exports were 6.7 percent of all industry exports in 1972.

Food products manufacturing

Food products manufacturing businesses are the principal markets for Minnesota agricultural products. Were it not for the food products manufacturing, agricultural exports would be much larger, but total value added in Minnesota by agriculture-related activity would be much less. Moreover, the close proximity of the agriculture-related processors adds to the farm value of Minnesota agricultural products.

Exports to rest-of-nation markets from Minnesota food products manufacturing businesses were more than \$2.1 billion in 1972. Meat products were the largest category of exports, with dairy products second, and

grain mill products, as follows (Table 1.2, ref. 3):

<u>Industry</u>	<u>Excess Supply</u>		<u>Deficit Supply</u>	
	<u>Total</u> (mil.\$)	<u>Prop. of</u> <u>Gr. Out.</u> (%)	<u>Total</u> (mil.\$)	<u>Prop. of</u> <u>Tot. Req.</u> (%)
Meat prod.	1,074.2	60.3	67.2	8.7
Dairy prod.	539.9	45.0	20.7	3.0
Fruit and veg.	96.7	30.0	49.9	18.1
Grain mill	191.3	39.8	101.3	25.9
Bakery	0	0	61.7	40.0
Sugar prod.	138.8	57.6	60.3	37.1
Soybean, veg.	92.9	31.7	169.3	45.8
Alch. bev.	4.9	5.1	173.8	65.5
Total	2,133.8	47.4	769.1	23.8

These exports were 47.4 percent of total industry sales (as compared with 14.1 percent of total sales for agricultural products). Despite these exports, \$769.1 million of food products were imported from food products manufacturing businesses in rest of nation. These imports were 23.8 percent of total requirements. Minnesota industries supplied the remaining 76.2 percent of food products manufacturing requirements (which originated from both intermediate and final demand sectors). Because of the variety of food products purchased for final use in the State, the value of imports remained high. Even food products which are almost identical to those produced in the State are imported because of seasonal supply and demand imbalances and price and product competition.

Imports of food products manufacturing businesses from rest-of-nation industries totaled \$540 million in 1972. These imports were 12 percent of

the total value of food products. Wide differences occurred, however, in the relative value of imports, as follows:

<u>Industry</u>	<u>Imports</u>		<u>Net Transfer</u> (mil. \$)	<u>Excess Supply as Proportion of Total</u> (%)
	<u>Total</u> (mil. \$)	<u>Prop. of Gr. Out.</u> (%)		
Meat prod.	297.4	16.7	766.0	15.5
Dairy prod.	31.1	3.1	379.8	7.8
Fruit and veg.	58.5	33.7	3.9	1.4
Grain mill	70.3	23.0	90.4	2.8
Bakery	8.4	22.6	-46.9	0
Sugar prod.	21.3	51.0	-33.7	0
Soybean. veg.	17.4	8.7	124.0	2.0
Alch. bev.	35.7	23.6	-13.6	1.3
Misc. food	24.4	55.1	-23.9	0.1
Total	540.0	12.0	1,364.1	30.7

These data show, also, that for five of the nine food products manufacturing industries, exports exceeded imports. Indeed, for all food products manufacturing, exports exceeded imports by nearly \$1.4 billion.

Food products manufacturing accounted for nearly one-third of Minnesota industry exports to rest-of-nation markets in 1972. The economic importance of food products manufacturing, when measured by its contribution to the economic base of Minnesota and its balance of payments, is much larger than indicated earlier by its sales and value added.

Economic Impact Measurement

Economic impact measurement, in this report, refers to the use of two types of input-output multipliers -- demand multipliers and supply

multipliers. The two multipliers show the total effect -- direct and indirect -- on all industry sales of a one-unit change in the demand for, or the supply of, a particular industry output. The multipliers are derived from the interindustry transactions table (see, Appendix Table 1.1) and the corresponding input coefficients table (Appendix Table 1.2) and disbursement coefficients table (which is not included).

Demand multipliers

The demand multiplier for an industry is represented by its column total in the conventional Leontief, i.e., $(I-A)$, inverse (see, Appendix Table 1.3). The totals in Appendix Table 1.3 are multiplied by corresponding changes in total final demands to obtain their direct and indirect effects on industry sales and purchases. For example, a \$1 million increase in total final demand -- local and export -- for meat products (Ind. No. 13) results in a \$2.608 million increase in all industry outputs. This increase includes the \$1 million in meat products plus an additional \$0.123 million increase in meat product output resulting from the additional input requirements of those industries supplying inputs to the meat products industry.

The conventional demand multiplier accounts for the short-term impact of a given demand change on all industry sales. Its magnitude depends on the proportion that total purchases from local input-supplying industries are of all purchases. The larger this proportion, generally, the larger the multiplier.

When a primary input, such as labor (which is represented by employee compensation in the value added row) is included, total local purchases of inputs increases. Thus, a demand multiplier is an $(I-A)$ inverse, which

includes the employee compensation row and the corresponding personal consumption expenditures column (see, Table 1.1), is larger, and usually much larger, than the conventional, Type I demand multiplier. This new Type II multiplier depicts certain long-term effects of industry employees spending the income payments of the producing industries. When the all value added rows and all local final demand columns are included in the (I-A) inverse, very large demand multipliers are obtained, as shown in Table 4.1.

The expanded Type II demand multipliers are presented here simply to emphasize the nature and limitations of input-output multipliers: They account for short-term effects of demand and supply changes and they are based on certain strict assumptions of linearity and homogeneity, among others. Certainly the final demand relationships, for example, the consumption and investment functions, conform less to these assumptions than the intermediate demand relationships, which are represented by industry production functions (when including imports from rest of nation industries). The Type II demand multiplier thus serves, at best, as a partial measure of long-term output effects of changes in export demand. In this formulation, export-producing industries and rest-of-nation demand for exports "drive" the regional economy. Hence, for purely non-exporting-producing, i.e. residential, industries, long-term output effects would depend entirely on their linkages with export-producing industries.

Supply multipliers

The supply multiplier for an industry is represented by the row totals of a disbursement coefficients i.e., (I-D), inverse (see, Appendix Table 1.4). The row totals, (which are entered as row totals in Appendix

Table 4.1 Demand and Supply Multiplier of Specified Industry, Minnesota, 1972.

Industry No. Title	Demand		Supply	
	Type I <u>1/</u>	Extended Type II <u>2/</u>	Type I <u>3/</u>	Extended Type II <u>4/</u>
1. Dairy Farm	1.856	8.542	2.328	4.469
2. Poul., Eggs	2.336	7.869	2.130	5.996
3. Meat An.	2.293	8.020	2.591	5.193
4. Food, Feed	1.523	7.917	2.624	4.806
5. Vegetables	1.363	8.206	1.588	9.694
6. Sugar Crop	1.477	7.790	1.532	3.780
7. Oil-Bearing	1.422	8.292	1.989	2.939
8. Other Crop	1.382	8.187	2.112	9.290
9. For., Fish.	1.568	8.309	2.915	12.215
10. Agr., For.	1.802	8.153	3.126	7.136
11. Mining	1.640	7.739	1.221	1.991
12. Construction	1.671	7.958	1.282	9.875
13. Meat Products	2.608	7.669	1.252	3.836
14. Dairy Products	2.869	9.500	1.624	4.242
15. Fruit and Veg.	1.939	7.630	1.300	6.873
16. Grain Mill	2.135	7.949	2.093	4.563
17. Bakery	1.757	8.334	1.305	9.967
18. Sugar Prod.	1.866	7.361	1.862	10.556
19. Soybean & Veg. Oil	2.274	8.684	1.729	2.825
20. Alch. Veb.	1.861	8.003	1.250	6.989
21. Misc. Food	1.801	7.045	1.410	9.350
22. Che. & Al.	1.738	7.146	2.032	7.708
23. Petr. Ref.	1.413	4.838	2.059	9.860
24. Farm Mach.	1.673	7.422	1.433	6.461
25. Other Mfg.	1.683	7.409	1.761	6.810
26. Transportation	1.506	8.458	1.881	7.262
27. Comm., Utilities	1.508	8.077	1.975	9.266
28. Wh. & Ret.	1.420	8.690	1.401	8.491
29. Fin., Ins.	1.366	8.884	1.620	9.356
30. Services	1.541	8.440	1.651	9.110
31. Gov't. Ent.	1.493	8.530	2.219	8.962
32. Scrap	2.024	5.560	3.561	10.401
33. Value Added	--	7.963	--	9.096

1/ Demand Type I multiplier is given in the conventional Leontief inverse, i.e., $[I-A]^{-1}$, which consists of the 32 interacting sectors in the Minnesota tables.

2/ Demand Extended Type II multiplier is given in the extended Leontief inverse of 33 interacting sectors, including the value added row and the final local demand column in the Minnesota tables.

3/ Supply Type I multiplier is given in the inverse of the row, or disbursement, coefficients matrix, i.e., $[I-D]^{-1}$.

4/ Supply Extended Type II multiplier is given in the inverse of the extended row coefficients matrix of the 33 interacting sectors in the Minnesota tables.

Table 1.4), are the industry supply multipliers in Table 4.1. The supply multiplier is used when the effects of a given change in industry output, for example, a reduction in the supply of petroleum products, must be determined. In an economy of increasing resource, rather than market, constraints, the supply, rather than demand, multiplier is the more appropriate for measuring regional economic impacts.

Short-term supply multipliers are designated as Type I supply multipliers in Table 4.1. They are compared with the Type I demand multiplier. Generally, the supply multiplier is smaller than the demand multiplier for large export-producing industries. When both demand and supply multipliers are small, the industry has few supply (backward) and demand (forward) linkages to other industries in the region.

Gross State Product

A summary statistic of the economic impact of export-producing industry is the Gross State Product (GSP) and its representation as (1) income of primary input sectors and (2) purchases of final product. In Table 5.1, both the primary income payments and final product purchases and the intermediate sales and purchases are presented. Here, the 1972 Minnesota GSP is \$20,875,348,000 rather than \$20,922,000,000, as shown earlier, because of the inclusion of additional income transfers (of -\$251,451,000 in capital accumulation and \$230,407,000 in exports).

The gross state product identity,

$$\text{GSP} = \text{Value Added} = \text{Local Final Product and Exports-Imports,}$$

is now represented numerically (in \$1,000), as follows:

Table 5.1 Summary income and product accounts, Minnesota, 1972.

Purchasing Sector	Local		Rest of Nation	Total
	Inter- mediate	Primary		
	(\$1,000)			
Local:				
Intermediate	15,580,446	18,762,838	4,279,272	38,622,556
Final, total	15,617,154	1,882,103	3,281,268	20,780,525
Personal consumption	10,845,257	32,124	2,117,245	12,994,626
Gross private fixed investment	3,222,343	-251,451	846,597	3,817,489
Federal government	370,601	531,516	202,843	1,104,960
State and local government	1,178,953	1,569,914	114,583	2,863,450
Rest of Nation:				
Exports	7,425,156	230,407	-118,718	7,536,645
Total	38,622,556	20,875,348	7,441,822	66,939,726

$$\begin{aligned}
 \text{GSP} &= 18,62,838 + 1,882,103 + 230,407 \\
 &= 20,780,525 + 7,536,645 - 7,441,822 \\
 &= 20,875,348
 \end{aligned}$$

Individual entries in the gross state product equation are acquired directly from Appendix Table 3.1.

Thus, the inclusion of the additional local primary and rest-of-nation transfers in Table 5.1 resulted in a net increase of \$46,652,000 in the GSP equation entries. On the value added side, the additional transfers represent income payments of households to household workers (\$32,124,000), a negative inventory valuation adjustment (\$251,451,000) and a positive U.S. allocation inventory of net competitive exports (\$230,407,000). On the final product side, additional transfers include the same three transfers and, also, a negative U.S. allocation of net competitive exports (\$178,817,000). The U.S. net export allocations represent equivalent net exports to rest of nation which were replaced by the allocated exports.

References Cited

1. Hwang, Henry H. and Wilbur W. Maki. Users' guide to the Minnesota two-region input-output model. Staff Paper Series P79-34. Department of Agricultural and Applied Economics, University of Minnesota, St. Paul, September 1979.
2. Maki, Wilbur R., Patrick D. Meagher and Leonard A. Laulainen, Jr. Users' guide to the Minnesota regional development simulation laboratory. Staff Paper Series P79-28. Department of Agricultural and Applied Economics, University of Minnesota, St. Paul. July 1979.
3. Maki, Wilbur R. Regional input-output and social accounting systems for agricultural and rural development planning. Staff Paper Series P80-21. Department of Agricultural and Applied Economics, University of Minnesota, St. Paul. September 1980.
4. Maki, Wilbur R., Peter A. Stenberg and Mason Chen. Economic importance of export-producing industry in Minneapolis-St. Paul Metropolitan area. Staff Paper Series P80-29. Department of Agricultural and Applied Economics, University of Minnesota, St. Paul, December 1980.
5. Ritz, Philip M., Eugene P. Roberts, and Paula G. Young. Dollar values for the 1972 input-output study. Survey of Current Business 59(4) 51-72. April 1979.

APPENDIX
 TABLE 1.1. TOTAL INTERSECTORAL TRANSFERS IN TWO-REGION INPUT-OUTPUT SYSTEM : REGION A (MINNESOTA) PURCHASES
 OF SPECIFIED REGION A GROSS OUTPUT, BY PURCHASING SECTOR, 1972

INDUSTRY	1	2	3	4	5	6	7	8	9	10
1 DAIRY FARM	0	0	3728.	6040.	7.	0	358.	0.	0	578.
2 POUL., EGGS	0	0	0	1643.	10.	0	450.	0.	0	3254.
3 MEAT AN.	0	0	329572.	23378.	192.	182.	3675.	88.	135.	2597.
4 FOOD, FEED	125337.	21235.	294077.	22025.	0	0	0	0	0	2455.
5 VEGETABLES	0	0	82.	0	857.	0	0	0	0	349.
6 SUGAR CROPS	0	0	0	0	0	1102.	0	0	23.	164.
7 OIL-BEARING	0	0	182.	0	0	0	17658.	0	0	636.
8 OTHER CROPS	0	0	0.	0	619.	0	0	789.	484.	1011.
9 FOR., FISH.	0	0	0	3274.	0	0	0	0	4.	28.
10 AGR., FOR., FISH.	8249.	10426.	12714.	10501.	1918.	905.	4292.	631.	74.	1089.
11 MINING	23.	0	0	3171.	91.	43.	239.	41.	0	14.
12 CONSTRUCTION	3469.	638.	5967.	0459.	370.	269.	2602.	138.	0	820.
13 MEAT PRODUCTS	0	0	189.	0	0	0	0	0	0	4.
14 DAIRY PRODUCTS	0	0	0	0	0	0	0	0	0	0
15 FRUIT & VEG. PROD.	0	0	0	0	0	0	0	0	0	0
16 GRAIN MILL PROD.	47672.	40186.	64208.	0	0	0	0	0	13.	112.
17 BAKERY	0	0	0	0	0	0	0	0	0	0
18 SUGAR PROD.	1277.	0	1384.	5.	0	0	0	0	0.	3.
19 SOYBEAN, VEG. OIL	6259.	2851.	15823.	0	0	0	0	0	0	0
20 ALCH. BEV., SOFT DR.	470.	0.	511.	0.	0.	0	0.	0.	0.	0.
21 MISC. FOOD, TOB.	0.	0.	0.	0.	0	0	0.	0.	44.	0.
22 CHEM. & ALLIED	2262.	290.	1600.	22314.	1204.	1142.	4717.	554.	33.	499.
23 PETR. REF. & PROD.	1603.	490.	3303.	17994.	466.	363.	4691.	373.	76.	766.
24 FERN MACH.	2510.	372.	4872.	8126.	315.	106.	2819.	169.	0	306.
25 OTHER MFG.	2710.	2361.	3428.	5971.	557.	105.	1109.	526.	467.	3723.
26 TRANSPORTATION	18627.	2152.	11506.	13031.	752.	351.	1960.	327.	87.	2023.
27 COMM., UTIL.	4804.	1328.	11903.	6906.	200.	89.	822.	302.	9.	661.
28 WH. & RET. TRADE	11608.	7214.	41980.	33435.	3686.	988.	6493.	1882.	165.	2607.
29 FIN., INS., REAL EST.	18693.	2705.	36940.	91949.	2757.	3293.	30338.	1124.	84.	2126.
30 SERVICES	5041.	4367.	12273.	16340.	655.	477.	5012.	602.	177.	5717.
31 GOVT ENT.	67.	19.	174.	120.	9.	4.	46.	3.	2.	106.
32 SCRAP	0	0	0	0	0	0	0	0	6.	6.
33 SUB-TOTAL	260680.	96632.	856418.	296132.	14664.	9496.	88171.	7569.	1817.	31914.
34 HOUSEHOLD	6031.	7506.	7339.	8156.	45526.	0	1336.	12453.	1957.	1471.
35 IMPORT	30006.	19409.	158163.	122363.	6328.	4710.	29439.	3082.	415.	7259.
36 VALUE ADDED	207072.	8347.	227911.	458502.	-4845.	16131.	196389.	7024.	990.	26405.
37 TOTAL	503790.	131894.	1249891.	885153.	61673.	30338.	315335.	30128.	5239.	67049.

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APPENDIX
 TABLE F.1. TOTAL INTERSECTORAL TRANSFERS IN TWO-REGION INPUT-OUTPUT SYSTEM : REGION A (MINNESOTA) PURCHASES
 OF SPECIFIED REGION A GROSS OUTPUT, BY PURCHASING SECTOR, 1972

INDUSTRY	11	12	13	14	15	16	17	18	19	20
1 DAIRY FARM	0	0	0	394642.	0	0	0	0	0	0
2 POUL., EGGS	0	0	98655.	0	0	0	0	0	0	0
3 MEAT AN.	0	0	840657.	83.	329.	40.	0	0	0	0
4 FOOD, FEED	0	0	539.	0	0	106617.	182.	0	2834.	21918.
5 VEGETABLES	0	0	0	0	13717.	0	0	0	0	0
6 SUGAR CROPS	0	0	0	0	0	0	0	0	0	0
7 OIL-BEARING	0	0	0	0	0	0	34.	7453.	154956.	0
8 OTHER CROPS	0.	1818.	0.	33.	2456.	84.	47.	1212.	809.	879.
9 FOR. FISH.	0	0.	0	0	1351.	2.	0	412.	128.	0
10 AGR., FOR., FISH.	0	1171.	0	0	0	0	0	0	0	0
11 MINING	14249.	17573.	1427.	18.	0.	159.	0.	14.	44.	0.
12 CONSTRUCTION	16257.	840.	1428.	1652.	760.	845.	334.	208.	289.	1074.
13 MEAT PRODUCTS	1.	149.	190536.	1999.	10204.	1785.	1111.	11.	7780.	25.
14 DAIRY PRODUCTS	0	0	401.	445571.	2459.	2967.	1131.	1284.	0	1145.
15 FRUIT & VEG. PROD.	0	0	3293.	95.	22035.	2026.	877.	221.	421.	2103.
16 GRAIN MILL PROD.	0.	0	35.	58.	1604.	61876.	11297.	278.	46.	1835.
17 BAKERY	0	0	0	280.	780.	19.	635.	46.	0	0
18 SUGAR PROD.	2.	93.	9.	3640.	3520.	4920.	2115.	15769.	871.	4113.
19 SOYBEAN, VEG. OIL	0	0	1498.	46.	166.	38001.	201.	50.	11063.	17.
20 ALCH. BEV., SOFT DR.	1.	8.	1.	1123.	1015.	898.	17.	113.	0.	8195.
21 MISC. FOOD, TOB.	0.	0.	2045.	1474.	2390.	1045.	1011.	1624.	0.	263.
22 CHEM. & ALLIED	7897.	24415.	1695.	1426.	1362.	2153.	273.	183.	655.	371.
23 PETR. REF. & PROD.	4861.	34208.	1155.	2099.	525.	473.	294.	185.	226.	559.
24 FARM MACH.	0	0	0	0	0	0	0	0	0	0
25 OTHER MFG.	47608.	660426.	31156.	83933.	53221.	16119.	6593.	5155.	1463.	60857.
26 TRANSPORTATION	12329.	73069.	13607.	11632.	19250.	23436.	2212.	2249.	7745.	6714.
27 COMM. UTIL.	36302.	8548.	7849.	7825.	3170.	3503.	1019.	905.	2230.	3407.
28 WH. & RET. TRADE	15471.	241845.	59171.	51576.	23472.	22779.	3232.	4318.	4138.	11912.
29 FIN., INS., REAL EST.	96479.	31630.	4999.	7150.	2996.	3311.	1098.	659.	1202.	2905.
30 SERVICES	22025.	156867.	11451.	23521.	11510.	15057.	4164.	3445.	2488.	17591.
31 GOV'T ENT.	2488.	1068.	777.	953.	261.	363.	271.	104.	43.	287.
32 SCRAP	5089.	463.	709.	407.	169.	308.	3.	16.	920.	41.
33 SUB-TOTAL	281057.	1254191.	1271706.	1011245.	178723.	308784.	38150.	45925.	200352.	154212.
34 HOUSEHOLD	74.	0	197470.	151924.	112034.	41424.	64492.	28431.	295.	129223.
35 IMPORT	109010.	351564.	291771.	28388.	53593.	67161.	7438.	17209.	16131.	32958.
36 VALUE ADDED	275442.	1359516.	20587.	8553.	-21651.	63735.	-17595.	-1851.	24059.	-23462.
37 TOTAL	666384.	2965272.	1701534.	1200109.	322699.	481105.	92484.	89764.	240837.	2929330.

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APPENDIX
 TABLE 1.1. TOTAL INTERSECTORAL TRANSFERS IN TWO-REGION INPUT-OUTPUT SYSTEM : REGION A (MINNESOTA) PURCHASES
 OF SPECIFIED REGION A GROSS OUTPUT, BY PURCHASING SECTOR, 1972

INDUSTRY	21	22	23	24	25	26	27	28	29	30
1 DAIRY FARM	0	0	0	0	0	0	0	0	0	42.
2 POULTRY EGGS	0	0	0	0	0	77.	0	5052.	0	1725.
3 MEAT AN.	889.	62.	0	0	306.	0	0	0	0	1133.
4 FOOD, FEED	285.	157.	0	0	655.	1686.	0	0	0	5333.
5 VEGETABLES	1217.	0	0	0	0	96.	0	9061.	0	716.
6 SUGAR CROPS	0	0	0	0	0	0	0	0	0	7.
7 OIL-BEARING	1707.	210.	0	0	0	0	0	0	0	37.
8 OTHER CROPS	814.	501.	1.	0.	1898.	55.	49.	248.	1244.	281.
9 FOR., FISH.	22.	53.	0	0	3577.	7.	0	1049.	1.	19.
10 AGR., FOR., FISH.	0	62.	12.	19.	738.	0	0	1360.	7043.	1805.
11 MINING	0	3011.	19026.	0	20894.	51.	8090.	0	0.	0.
12 CONSTRUCTION	193.	1756.	6266.	350.	27241.	64707.	42136.	21119.	105523.	422991.
13 HEAT PRODUCTS	435.	1002.	41.	8.	8601.	1362.	44.	99196.	299.	9262.
14 DAIRY PRODUCTS	1010.	186.	0	0	236.	370.	0	33428.	0	5346.
15 FRUIT & VEG. PROD.	2942.	420.	0	0	117.	475.	0	28413.	0	5379.
16 GRAIN MILL PROD.	4644.	361.	0	240.	0.	31.	0	2694.	0	760.
17 BAKERY	693.	0	0	0	0	181.	0	15997.	0	1268.
18 SUGAR PROD.	881.	262.	3.	6.	814.	301.	21.	4435.	149.	482.
19 SOYBEAN, VEG. OIL	235.	5546.	312.	0	119.	0.	0	0.	0	0.
20 ALCH., BEV., SOFT DR.	310.	57.	0.	0.	570.	80.	2.	37843.	14.	426.
21 MISC. FOOD, TOB.	1932.	54.	0.	0.	17.	200.	0.	13319.	0.	1648.
22 CHEM. & ALLIED	1091.	53585.	4705.	277.	109599.	1408.	0.	4326.	570.	17431.
23 PETR. REF. & PROD.	168.	8035.	17658.	305.	22911.	34566.	15083.	20941.	6226.	15511.
24 FARM MACH.	0	0	0	7760.	9451.	0	0	152.	435.	2940.
25 OTHER MFG.	9691.	48219.	8630.	49176.	2293536.	30043.	0	72396.	36443.	437421.
26 TRANSPORTATION	3569.	15509.	17908.	2563.	212491.	149896.	7955.	70666.	9982.	49945.
27 COMM., UTIL.	821.	8981.	7402.	1485.	107564.	22477.	8464.	120255.	47648.	168177.
28 HH. & RET. TRADE	4211.	16450.	4119.	8527.	347525.	46192.	12124.	171506.	44077.	121039.
29 FIR., INS., REAL EST.	1263.	11289.	4715.	1610.	157527.	46731.	29389.	235694.	511563.	269722.
30 SERVICES	5874.	41742.	8051.	5355.	279684.	83645.	50617.	370812.	174100.	349554.
31 GOV. ENT.	91.	801.	406.	265.	18923.	32928.	94129.	54178.	32282.	29182.
32 SCRAP	19.	551.	3.	517.	30135.	103.	3.	136.	0	1137.
33 SUB-TOTAL	45199.	218949.	99268.	78464.	3655131.	517678.	494868.	1394277.	1057292.	1472719.
34 HOUSEHOLD	34419.	66159.	61166.	1508.	768227.	421909.	517007.	4401341.	3445428.	2382051.
35 IMPOKT	23478.	104667.	186348.	34023.	1587073.	109496.	175354.	248557.	114470.	304719.
36 VALUE ADDED	-6437.	92236.	24722.	76164.	2671723.	507311.	288396.	-624719.	-353369.	97017.
37 TOTAL	96659.	482011.	372004.	190159.	8682153.	1556393.	1475625.	5419457.	4263822.	4255506.

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APPENDIX
 TABLE 1.1. TOTAL INTERSECTORAL TRANSFERS IN TWO-REGION INPUT-OUTPUT SYSTEM : REGION A (MINNESOTA) PURCHASES
 OF SPECIFIED REGION A GROSS OUTPUT, BY PURCHASING SECTOR, 1972

INDUSTRY	31	32	33
1 DAIRY FARM	0	0	405405.
2 POUL., EGGS	0	0	110877.
3 MEAT AN.	0	0	1203318.
4 FOOD, FEED	1355.	0	606690.
5 VEGETABLES	8.	0	26103.
6 SUGAR CROPS	0	0	8750.
7 OIL-BEARING	635.	0	177269.
8 OTHER CROPS	33.	0	17843.
9 FOR., FISH., FISH.	0	0	6243.
10 AGR., FOR., FISH.	113.	0	64747.
11 MINING	25.	0	96904.
12 CONSTRUCTION	35773.	0	474531.
13 HEAT PRODUCTS	17.	0	334061.
14 DAIRY PRODUCTS	138.	0	465672.
15 FRUIT & VEG. PROD.	0	0	68825.
16 GRAIN MILL PROD.	304.	0	238253.
17 BAKERY	0	0	19908.
18 SUGAR PROD.	13.	0	45089.
19 SOYBEAN, VEG. OIL	133.	0	82319.
20 ALCH. BEV., SOFT DR.	1.	0	51656.
21 MISC. FOOD, TOB.	3.	0.	27069.
22 CHEM. & ALLIED	1805.	0	271383.
23 PETR., REF. & PROD.	3292.	123.	219540.
24 FARM MACH.	47.	138.	40616.
25 OTHER MFG.	7229.	15195.	4011697.
26 TRANSPORTATION	20738.	849.	786257.
27 COMM., UTIL.	22647.	0	825027.
28 WH. & RET. TRADE	4550.	0	1320301.
29 FIN., INS., REAL EST.	8946.	0	1560998.
30 SERVICES	13922.	0	1703536.
31 GOV'T ENT.	659.	0	271012.
32 SCRAP	1.	0	40742.
33 SUB-TOTAL	122397.	16305.	15580446.
34 HOUSEHOLD	78157.	0	12994623.
35 IMPORT	23077.	10313.	4279272.
36 VALU. ADDED	163911.	-0.	5768215.
37 TOTAL	387541.	26617.	38622556.

(1000)

APPENDIX
 TABLE 1.1. TOTAL INTERSECTORAL TRANSFERS IN TWO-REGION INPUT-OUTPUT SYSTEM : REGION A (MINNESOTA) PURCHASES
 OF SPECIFIED REGION A GROSS OUTPUT, BY PURCHASING SECTOR, 1972

INDUSTRY	33	34	35	36	37	38	39	40	41	42
1 DAIRY FARM	405405.	2134.	0	0	0	0	0	0	96251.	503790.
2 POUL.,EGGS	110877.	20064.	0	-654.	296.	-29.	24.	1316.	0	131894.
3 HEAT AN.	1203318.	3255.	0	11467.	1332.	-3089.	23.	29.	33557.	1249891.
4 FOOD, FEED	606690.	2872.	0	36823.	36651.	-574.	-7128.	216.	209602.	885153.
5 VEGETABLES	26103.	34857.	0	917.	1550.	-2816.	15.	1047.	0	61673.
6 SUGAR CROPS	8750.	0	0	-195.	0	0	0	0	21783.	30338.
7 OIL-BEARING	177269.	326.	0	10434.	27382.	-14.	-1997.	0	101935.	315335.
8 OTHER CROPS	17843.	10175.	0	1743.	763.	-3277.	-4.	957.	1928.	30128.
9 FOR.,FISH.	6243.	2438.	0	99.	297.	-2919.	-941.	22.	0	5239.
10 AG.,FOR.,FISH.	64747.	1417.	0	0	216.	-16.	94.	593.	0	67049.
11 MINING	86804.	83.	0	949.	3534.	-17343.	-305.	-224.	592156.	666384.
12 CONSTRUCTION	474531.	0	1777298.	0	267.	0	69352.	613498.	30325.	2965272.
13 HEAT PRODUCTS	334051.	326937.	0	8892.	9662.	-20834.	283.	14403.	1108129.	1781534.
14 DAIRY PRODUCTS	465672.	175737.	0	2220.	3242.	-2899.	2068.	8478.	545592.	1200109.
15 FRUIT & VEG. PROD.	68825.	140288.	0	4577.	4577.	-7094.	105.	6451.	105878.	322699.
16 GRAIN MILL PROD.	238253.	40895.	0	4079.	4980.	-630.	439.	1112.	191977.	481105.
17 BAKERY	19908.	70348.	0	331.	134.	-185.	25.	1923.	0	92484.
18 SUSAK PROD.	45089.	52703.	0	1037.	700.	-11132.	9.	1358.	0	89764.
19 SOYBEAN, VEG. OIL	82319.	549.	0	4596.	13041.	-3279.	122.	0.	143489.	240837.
20 ALCH. BEV.,SOFT DR.	51666.	143090.	0	3990.	319.	-1085.	13.	408.	94530.	292930.
21 HISC. FOOD.,TOB.	27069.	60766.	0	2293.	764.	-1670.	170.	2076.	5191.	96659.
22 CHEM. & ALLIED	271383.	116020.	0	795.	25937.	-9659.	6216.	7285.	56362.	482011.
23 PETR. REF. & PROD.	219540.	158163.	0	782.	8197.	-29660.	5611.	9372.	0	372004.
24 FARM MACH.	40616.	1155.	0	6439.	8146.	-7077.	150.	038.	60946.	193159.
25 OTHER MFG.	4011697.	980289.	768919.	218806.	288066.	-288607.	1548801.	103150.	2445033.	8582153.
26 TRANSPORTATION	746257.	341084.	22398.	16777.	65907.	-16224.	25873.	32339.	281982.	1596393.
27 COMM., UTIL.	825027.	501226.	22911.	0	7550.	-6358.	12966.	60122.	45181.	1475625.
28 MH. & RET. TRADE	1320301.	3130672.	191719.	33135.	71083.	46454.	16102.	-3684.	605676.	5419457.
29 FIN.,INS.,REAL EST.	1560898.	2445945.	62603.	0	30944.	-2556.	10669.	63247.	92071.	4263822.
30 SERVICES	1703536.	1975655.	3110.	-2958.	19176.	-626.	67156.	221782.	259676.	4256506.
31 GOVT ENT.	271012.	68036.	0	0	1890.	0	4772.	11187.	30644.	367541.
32 SCRAP	40742.	38077.	-100190.	6761.	15945.	-17530.	3918.	19652.	19243.	26617.
33 SUB-TOTAL	15580446.	10845257.	2836239.	386104.	652547.	-440729.	370601.	1178953.	7183139.	39622556.
34 HOUSEHOLD	12994623.	0	0	0	0	0	0	0	0	12994623.
35 IMPORT	4279272.	2117245.	638417.	208180.	352642.	-471360.	202843.	144583.	0	7441822.
36 VALUE ADDED	5768215.	32124.	0	-251451.	245755.	-54650.	531516.	1569914.	39302.	7880725.
37 TOTAL	38622556.	12994626.	3474657.	342832.	1250944.	-936739.	1104960.	2863450.	7222440.	66939726.

(10000)

APPENDIX TABLE 1.2. TOTAL INTERMEDIATE PURCHASES OF SPECIFIED INDUSTRY OUTPUT PER \$1 TOTAL OUTLAY IN TWO-REGION INPUT-OUTPUT SYSTEMS:
MINNESOTA INTERMEDIATE PURCHASES OF SPECIFIED REST OF NATION CROSS OUTPUT, BY PURCHASING SECTOR, 1972.

INDUSTRY NAMES	1	2	3	4	5	6	7	8	9	10
1 DAIRY FARM	0	0	.002983	.006823	.000114	0	.001157	.000003	0	.008617
2 POULTRY EGGS	0	0	0	.001857	.000169	0	.001427	.000013	0	.048527
3 MEAT AN.	0	0	.263680	.026412	.003110	.005990	.011653	.002908	.025698	.038739
4 FOOD, FEED	.248789	.160997	.235282	.024882	0	0	0	0	0	.036616
5 VEGETABLES.	0	0	.000066	0	.013893	0	0	0	0	.005203
6 SUGAR CROPS	0	0	0	0	0	.036333	0	0	.004320	.002448
7 OIL-BEARING	0	0	.000146	0	0	0	.055997	0	0	.009481
8 OTHER CROPS	0	0	.000000	.003699	.010035	0	0	.026189	.092371	.015073
9 FOR. FISH.	0	0	0	0	0	0	0	0	.000669	.000411
10 AGR. FOR. FISH.	.016373	.079047	.010172	.011063	.031100	.029829	.013612	.020947	.014088	.016247
11 MINING	.000047	0	0	.003503	.001469	.001425	.000758	.001377	0	.066201
12 CONSTRUCTION	.006806	.004836	.004774	.009557	.005992	.008855	.008253	.004564	0	.013129
13 MEAT PRODUCTS	0	0	.000151	0	0	0	0	0	0	.009063
14 DAIRY PRODUCTS	0	0	0	0	0	0	0	0	0	0
15 FRUIT & VEG. PROD.	0	0	0	0	0	0	0	0	0	0
16 GRAIN MILL PROD.	.094626	.304687	.051371	0	0	0	0	0	.002430	.001666
17 BAKERY	0	0	0	0	0	0	0	0	0	0
18 SUGAR PROD.	.002535	0	.001199	.000005	0	0	0	0	.000039	.000042
19 SOYBEAN, VEG. OIL	.012424	.021617	.012660	0	0	0	0	0	0	0
20 ALCH. DEV. SOFT DR.	.000934	.000000	.000409	.000000	.000001	0	0	.000001	.000002	.000003
21 MISC. FOOD, TOB.	.000000	.000000	.000000	.000000	0	0	.000000	0	.008338	.009000
22 CHEM. & ALLIED	.004490	.002195	.001280	.025209	.019525	.037634	.014958	.018387	.006226	.007446
23 PETR. REF. & PROD.	.003181	.003717	.002643	.020329	.007557	.011956	.014877	.012375	.014549	.011418
24 FARM MACH.	.004981	.002817	.003898	.009180	.005111	.006121	.008940	.006281	0	.004561
25 OTHER MFG.	.005379	.017897	.002743	.006746	.009034	.003476	.003770	.017455	.008261	.055532
26 TRANSPORTATION	.036973	.016316	.009205	.015682	.012196	.011559	.006215	.010852	.016574	.030166
27 COMM., UTIL.	.009535	.010067	.009523	.007802	.003237	.002920	.002605	.010040	.001705	.012841
28 WH. & RET. TRADE	.023042	.054699	.033587	.037773	.059774	.032556	.020590	.062464	.031488	.038884
29 FIN. INDS. REAL EST.	.037104	.020510	.029554	.103880	.044698	.108529	.096210	.037322	.016095	.031712
30 SERVICES	.010006	.033107	.009819	.019138	.010617	.015713	.018432	.019971	.033798	.085271
31 GOV'T ENT.	.000133	.000141	.000140	.000136	.000142	.000130	.000146	.000083	.000426	.001582
32 SCRAP	0	0	0	0	0	0	0	0	.001113	.000096
33 SUB-TOTAL	.517438	.732650	.685194	.334555	.237773	.313027	.279609	.251231	.358191	.475977

(DOLLARS)

APPENDIX TABLE 1.2. TOTAL INTERMEDIATE PURCHASES OF SPECIFIED INDUSTRY OUTPUT PER \$1 TOTAL OUTLAY IN TWO-REGION INPUT-OUTPUT SYSTEMS: MINNESOTA INTERMEDIATE PURCHASES OF SPECIFIED REST OF NATION GROSS OUTPUT BY PURCHASING SECTOR, 1972 (CONTINUED).

INDUSTRY	11	12	13	14	15	16	17	18	19	20
1 DAIRY FARM	0	0	0	.328839	0	0	0	0	0	0
2 POUL., EGGS	0	0	.055382	0	0	0	0	0	0	0
3 MEAT AN.	0	0	.471873	.000069	.001020	.000082	0	0	0	0
4 FOOD, FEED	0	0	.000302	0	0	.221608	.001964	0	.011767	.074624
5 VEGETABLES	0	0	0	0	.042507	0	0	0	0	0
6 SUGAR CROPS	0	0	0	0	0	0	0	.083030	0	0
7 OIL-BEARING	0	0	0	0	0	0	0	.013500	.643407	0
8 OTHER CROPS	.000000	.000613	.000000	.000027	.007617	.000174	.000372	.004593	.003350	.003002
9 FOR., FISH.	0	.000000	0	0	.004187	.000005	0	0	.000531	0
10 AGR., FOR., FISH.	0	.000395	0	0	0	0	0	0	0	0
11 MINING	.021382	.005926	.000015	.000015	.000000	.000331	.000000	.000152	.000134	.000000
12 CONSTRUCTION	.024395	.000283	.000892	.001377	.002354	.001756	.003506	.002317	.001198	.003667
13 MEAT PRODUCTS	.000002	.000050	.106950	.001666	.031620	.003711	.012016	.000122	.000205	.000025
14 DAIRY PRODUCTS	0	0	.000225	.346278	.007621	.006168	.012228	.014299	0	.003908
15 FRUIT & VEG. PROD.	0	0	.001849	.000079	.068285	.004211	.009484	.002460	.001748	.007178
16 GRAIN MILL PROD.	.000000	0	.000020	.000048	.004970	.128612	.122149	.003097	.000191	.006263
17 BAKERY	0	0	0	.003240	.002418	.000039	.006866	.000516	0	0
18 SUGAR PROD.	.000003	.000031	.000005	.003933	.010900	.010227	.022867	.175671	.003617	.014040
19 SOYBEAN, VEG. OIL	0	0	.000841	.000038	.000514	.078987	.002173	.000556	.045936	.000057
20 ALCH. BEV., SOFT DR.	.000001	.000003	.000001	.000935	.003144	.001866	.000182	.001262	.000001	.027977
21 MISC. FOOD, TOB.	.000000	.000000	.001148	.001229	.007405	.002173	.010928	.018096	.000000	.000898
22 CHEM. & ALLIED	.011850	.008234	.000952	.001189	.004220	.004474	.002948	.002042	.002719	.001256
23 PETR. REF. & PROD.	.007294	.011536	.000649	.001749	.001628	.000984	.003177	.002064	.000938	.001907
24 FARM MACH.	0	0	0	0	0	0	0	0	0	0
25 OTHER MFG.	.071443	.222720	.017400	.069937	.164924	.033503	.071289	.057426	.006073	.235064
26 TRANSPORTATION	.018502	.024641	.007638	.009693	.059652	.048712	.023912	.025059	.032159	.022921
27 COMM., UTIL.	.056476	.002003	.004406	.006521	.009424	.007280	.011024	.010004	.009261	.011632
28 WH. & RET. TRADE	.023216	.081559	.033213	.042976	.072737	.047347	.034951	.048102	.017103	.040667
29 FIN., INS., REAL EST.	.144780	.010667	.002805	.005958	.009283	.006883	.011871	.007452	.004992	.009918
30 SERVICES	.031051	.052902	.006428	.019599	.035668	.031297	.045026	.038380	.010330	.060051
31 GOV'T ENT.	.003733	.000360	.000436	.000794	.000808	.000755	.002935	.001161	.000180	.000981
32 SCRAP	.007639	.000156	.000398	.000339	.000524	.000641	.000028	.000179	.003819	.000140
33 SUB-TOTAL	.421765	.422960	.713826	.842627	.553839	.641824	.412504	.511622	.831090	.526445

(DOLLARS)

APPENDIX TABLE 1.2. TOTAL INTERMEDIATE PURCHASES OF SPECIFIED INDUSTRY OUTPUT PER \$1 TOTAL OUTLAY IN TWO-REGION INPUT-OUTPUT SYSTEMS: MINNESOTA INTERMEDIATE PURCHASES OF SPECIFIED REST OF NATION CROSS OUTPUT BY PURCHASING SECTOR, 1972 (CONTINUED).

INDUSTRY	NAMES	21	22	23	24	25	26	27	28	29	30
1	DAIRY FARM	0	0	0	0	0	0	0	0	0	0
2	POUL., EGGS	0	0	0	0	0	0	0	0	0	0
3	MEAT AN.	.009194	.000129	0	0	.000035	0	0	.000932	0	.000010
4	FOOD, FEED	.002952	.000326	0	0	.000075	.001003	0	0	0	.000256
5	VEGETABLES	.012587	0	0	0	0	.000062	0	.001672	0	.001253
6	SUGAR CROPS	0	0	0	0	0	0	0	0	0	.000158
7	OIL-BEARING	.017665	.000436	0	0	0	0	0	0	0	.000002
8	OTHER CROPS	.008421	.001040	.000002	.000001	.000219	.000036	.000033	.000046	.003292	.000066
9	FOR., FISH.	.000226	.000110	0	0	.000412	.000005	0	.000194	.000000	.000005
10	AGR., FCR., FISH.	0	.000129	.000033	.000097	.000085	0	.001100	.000251	.001652	.000424
11	MINING	.000000	.006246	.000033	.000000	.002407	.000033	.005482	0	.000000	.000000
12	CONSTRUCTION	.001994	.003643	.016843	.001840	.003130	.041575	.020555	.003897	.043511	.010100
13	MEAT PRODUCTS	.004504	.002080	.000109	.000044	.000991	.000875	.000030	.010304	.000070	.002176
14	DAIRY PRODUCTS	.010454	.000385	0	0	.000027	.000238	0	.006168	0	.001256
15	EKUII & VEG. PROD.	.030439	.000887	0	0	.000013	.000306	0	.005243	0	.001204
16	GRAIN MILL PROD.	.048045	.000750	0	0	.000000	.000020	0	.000497	0	.000179
17	BAKERY	.007172	0	0	0	0	.000116	0	.002952	0	.000298
18	SUGAR PROD.	.009112	.000544	.000038	.000030	.000094	.000193	.000015	.000810	0	.000035
19	SOYBEAN, VEG. OIL	.002435	.011505	.000823	0	.000014	.000000	0	.000000	0	.000000
20	ALCH. DEV., SOFT DR.	.003211	.000119	.000001	.000002	.000066	.000056	.000001	.006983	.000003	.000100
21	MISC. FOOD., TOB.	.019992	.000112	.000000	.000000	.000002	.000128	.000000	.002458	.000000	.000000
22	CHEM. & ALLIED	.011286	.111169	.012649	.001457	.012624	.000905	.001044	.000798	.000134	.004095
23	PETR. REF. & PROD.	.001741	.016670	.047494	.001605	.002639	.022209	.010221	.003064	.001460	.003644
24	FARM MACH.	0	0	0	.040810	.001089	0	0	.000028	.000102	.000691
25	OTHER MFG.	.102327	.100037	.023200	.250603	.264167	.019303	.005391	.013358	.008547	.132765
26	TRANSPORTATION	.036818	.032341	.048138	.013477	.024474	.096310	.005736	.013039	.002271	.011734
27	COMH., UTIL.	.000401	.018632	.019890	.007810	.012389	.014442	.151527	.022190	.011173	.037631
28	WH. & RET. TRADE	.043568	.034127	.011072	.044844	.040028	.029679	.008216	.031646	.010337	.029436
29	FIN., INS., REAL EST.	.013070	.023420	.012674	.008465	.018144	.030025	.019917	.043490	.010978	.049271
30	SERVICES	.060774	.086599	.021643	.028160	.032214	.053743	.034302	.068422	.040832	.082122
31	GOV'T ENT.	.000940	.001662	.001092	.001395	.002180	.021157	.063789	.009997	.007571	.006856
32	SCRAP	.000192	.001142	.000008	.002717	.003471	.000066	.000002	.000025	0	.000267
33	SUB-TOTAL	.467610	.454241	.266847	.412622	.420994	.332614	.335362	.257273	.247968	.345993

(DOLLARS)

APPENDIX TABLE 1.2. TOTAL INTERMEDIATE PURCHASES OF SPECIFIED INDUSTRY OUTPUT PER \$1 TOTAL OUTLAY IN TWO-REGION INPUT-OUTPUT SYSTEMS: MINNESOTA INTERMEDIATE PURCHASES OF SPECIFIED REST OF NATION: GROSS OUTPUT, BY PURCHASING SECTOR, 1972 (CONCLUDED).

INDUSTRY	NAMES	31	32	33
1	DAIRY FARM	0	0*	.405E+06
2	POUL., EGGS	0	0*	.110E+06
3	MEAT AN.	0	0*	.120E+07
4	FOOD, FEED	.003497	0*	.606E+06
5	VEGETABLES	.000021	0*	.261E+05
6	SUGAR CROPS	0	0*	.874E+04
7	OIL-BEARING	.001639	0*	.177E+06
8	OTHER CROPS	.000085	0*	.178E+05
9	FOR., FISH.	0	0*	.624E+04
10	AGR., FOR., FISH.	.000292	0*	.647E+05
11	MINING	.000066	0*	.868E+05
12	CONSTRUCTION	.092306	0*	.474E+06
13	MEAT PRODUCTS	.000043	0*	.334E+06
14	DAIRY PRODUCTS	.000356	0*	.465E+06
15	FRUIT & VEG. PROD.	0	0*	.608E+05
16	GRAIN HILL PROD.	.000784	0*	.238E+06
17	BAKERY	0	0*	.199E+05
18	SUGAR PROD.	.000032	0*	.450E+05
19	SOYBEAN, VEG. OIL	.000342	0*	.823E+05
20	ALCH., BEV., SOFT DR.	.000003	0*	.516E+05
21	MISC. FOOD, TOB.	.000008	.000000*	.270E+05
22	CHEM. & ALLIED	.004659	0*	.271E+06
23	PETR. REF. & PROD.	.008495	.004607*	.219E+06
24	FARM MACH.	.000120	.005176*	.406E+05
25	OTHER MFG.	.016654	.570880*	.401E+07
26	TRANSPORTATION	.053512	.031897*	.796E+06
27	COMM., UTIL.	.058439	0*	.825E+06
28	WH. & RET. TRADE	.011760	0*	.132E+07
29	FIN., INS., REAL EST.	.023085	0*	.156E+07
30	SERVICES	.035925	0*	.170E+07
31	GOV'T ENT.	.001701	0*	.271E+06
32	SCRAP	.000003	0*	.407E+05
33	SUB-TOTAL	.315828	.512561*	.155E+08

(DOLLARS)

APPENDIX TABLE 1.3. DIRECT AND INDIRECT EFFECTS OF \$1 INCREASE IN FINAL PURCHASES FOR SPECIFIED INDUSTRY OUTPUT IN TWO-REGION INPUT-OUTPUT SYSTEM: MINNESOTA INTERMEDIATE PURCHASES OF SPECIFIED MINNESOTA GROSS OUTPUT, BY PURCHASING SECTOR, 1972.

INDUSTRY	1	2	3	4	5	6	7	8	9	10
1 DAIRY FARM	1.0022775	.004113	.007264	.007544	.000707	.000533	.001607	.000512	.000625	.009857
2 POUL., EGGS	.001782	1.005115	.001895	.002741	.001944	.001699	.002367	.001280	.001025	.009036
3 HEAT AN.	.013344	.018186	1.374281	.039965	.007321	.011165	.018410	.006535	.037851	.058132
4 FOOD, FEED	.285790	.255852	.353807	1.038933	.003943	.004798	.006432	.003145	.011700	.065046
5 VEGETABLES	.000258	.000765	.000381	.000193	1.014413	.000274	.000156	.000278	.000317	.005972
6 SUGAR CROPS	.000460	.000640	.000323	.000057	.000098	1.037798	.000051	.000071	.004565	.002656
7 OIL-BEARING	.015732	.036700	.017790	.001148	.000740	.000960	.000008	.000593	.001201	.013202
8 OTHER CROPS	.001627	.002694	.001861	.004278	.011057	.000647	.000354	1.027333	.095400	.016326
9 FOR., FISH.	.000054	.000131	.000058	.000037	.000046	.000043	.000028	.000047	1.000753	.006089
10 AGR., FOR., FISH.	.020916	.004969	.019317	.013690	.032770	.032116	.015424	.022275	.017237	1.023169
11 MINING	.002278	.002478	.002561	.005632	.002475	.002918	.002153	.002709	.017335	.002143
12 CONSTRUCTION	.018911	.018730	.018906	.019686	.011791	.018488	.016657	.010354	.005219	.023676
13 MEAT PRODUCTS	.002637	.005986	.003331	.001427	.001707	.001269	.000887	.001903	.001592	.002233
14 DAIRY PRODUCTS	.004675	.002503	.001712	.000667	.000789	.000574	.000418	.000035	.000854	.001152
15 FRUIT & VEG. PROD.	.000972	.002503	.000980	.000427	.000496	.000302	.000270	.000526	.000722	.000706
16 GRAIN MILL PROD.	.110506	.353406	.082684	.004227	.001381	.001494	.002202	.001071	.006064	.024104
17 BAKERY	.000187	.000369	.000235	.000174	.000226	.000152	.000107	.000239	.000242	.000243
18 SUGAR PROD.	.004724	.004908	.003173	.000260	.000163	.000157	.000136	.000163	.000399	.000334
19 SOYBEAN, VEG. OIL	.022635	.052543	.005415	.001431	.000567	.000885	.000753	.000586	.001233	.003229
20 ALCH. BEV., SOFT DR.	.001579	.001470	.001312	.000474	.000533	.000352	.000250	.000556	.000460	.000589
21 MISC. FOOD, TOB.	.000505	.001212	.000475	.000179	.000212	.000152	.000110	.000224	.000707	.000303
22 CHEM. & ALLIED	.015676	.015403	.014444	.031308	.023971	.045620	.019325	.022897	.012651	.014623
23 PETR. REF. & PROD.	.012992	.014831	.014427	.024938	.010505	.015920	.010498	.015625	.019247	.017894
24 FARM MACH.	.008152	.006430	.009379	.010344	.005786	.006371	.010181	.006993	.001239	.004467
25 OTHER MFG.	.039617	.080257	.037365	.036307	.019882	.031807	.026988	.044595	.142333	.114344
26 TRANSPORTATION	.059007	.055058	.032320	.025907	.019882	.020600	.012947	.018785	.029181	.047917
27 COMM. UTIL.	.022963	.030005	.028009	.018526	.018742	.011033	.009898	.019448	.012361	.028994
28 AH. & RET. TRADE	.051853	.102474	.076086	.052316	.071353	.045641	.031332	.074502	.052629	.056031
29 FIN., INS., REAL EST.	.089819	.080522	.102211	.134798	.062349	.138744	.124359	.054614	.037688	.067782
30 SERVICES	.040826	.085648	.045727	.042643	.028882	.039753	.036968	.039735	.057243	.126416
31 GOV'T ENT.	.004662	.006217	.004828	.003950	.002847	.003358	.002744	.003377	.003657	.006931
32 SCRAP	.000377	.000807	.000366	.000261	.000195	.000228	.000181	.000242	.001572	.000622
33 SUB-TOTAL	1.855605	2.335985	2.282951	1.523420	1.363092	1.477341	1.422212	1.381873	1.568492	1.802020

(DOLLARS)

APPENDIX TABLE 1.3. DIRECT ADM INDIRECT EFFECTS OF \$1 INCREASE IN FINAL PURCHASES FOR SPECIFIED INDUSTRY OUTPUT IN TWO-REGION INPUT-OUTPUT SYSTEM: MINNESOTA INTERMEDIATE PURCHASES OF SPECIFIED MINNESOTA GROSS OUTPUT, BY PURCHASING SECTOR, 1972 (CONTINUED).

INDUSTRY	NAMES	11	12	13	14	15	16	17	18	19	20
1	DAIRY FARM	.000190	.000421	.004391	.504795	.004938	.006061	.007566	.009313	.001465	.003116
2	POUL., EGGS	.000150	.000326	.063446	.001276	.002570	.001532	.001181	.000485	.003895	.000405
3	HEAT AH.	.000877	.001909	.728044	.010117	.029001	.010016	.012786	.003607	.003054	.004910
4	FOOD, FEED	.000555	.001039	.203593	.145224	.011799	.269360	.045336	.005575	.024405	.003292
5	VEGETABLES	.000100	.000234	.000451	.000310	.046652	.000495	.000903	.000661	.000264	.000541
6	SUGAR CROPS	.000012	.000025	.000222	.000737	.001312	.001314	.002618	.104597	.000449	.001554
7	OIL-SEAWING	.000212	.000226	.012442	.000237	.001915	.063569	.011121	.019998	.715434	.001031
8	OTHER CROPS	.000161	.000792	.0001216	.001004	.003693	.001089	.001213	.006144	.004670	.003835
9	FOR. FISH.	.000067	.000160	.000072	.000114	.000462	.000140	.000131	.000095	.000501	.000201
10	AGR. FOR. FISH.	.000591	.000671	.015571	.010763	.002731	.004872	.001285	.004055	.011276	.001512
11	MINING	1.023544	.007910	.001779	.002014	.001494	.002631	.001213	.001359	.002113	.001901
12	CONSTRUCTION	.018857	1.007238	.013017	.016142	.012272	.014536	.011242	.016844	.016423	.017441
13	HEAT PRODUCTS	.001232	.002085	.002970	.006204	.041119	.010647	.016490	.007626	.003019	.007649
14	DAIRY PRODUCTS	.000543	.0001220	.002071	1.531667	.014413	.012316	.021980	.027997	.000767	.007656
15	FOOD & VEG. PROD.	.000348	.000762	.003211	.001272	.0074573	.006108	.011942	.004596	.002457	.006540
16	GRAIN MILL PROD.	.000223	.000452	.065896	.056368	.010395	1.150309	.144131	.007244	.004148	.008521
17	BAKERY	.000142	.000344	.000304	.000739	.003048	.000376	1.007272	.001077	.000172	.000289
18	SUGAR PROD.	.000119	.000264	.002112	.008229	.014905	.015098	.030338	.013848	.004651	.017974
19	SOYBEAN, VEG. OIL	.000255	.000282	.017747	.011654	.002178	.0095840	.014709	.001695	1.049372	.001043
20	ALCH. BEV., SOFT DR.	.000311	.000793	.001104	.002875	.004390	.002913	.001087	.002309	.000397	1.029416
21	MISC. FOOD, TOB.	.000140	.000325	.001776	.002526	.0008877	.003165	.012445	.022754	.000318	.001691
22	CHEM. & ALLIED	.016641	.014945	.010520	.012882	.011873	.017301	.008668	.010938	.017657	.010177
23	PETR. REF. & PROD.	.011348	.015487	.010139	.011430	.007265	.011964	.007548	.007387	.015735	.007514
24	FARM MACH.	.000280	.000478	.005429	.004471	.0006935	.003513	.000839	.001231	.007274	.001382
25	OTHER MFG.	.133817	.325656	.057282	.180711	.272393	.086364	.134122	.123991	.040044	.358704
26	TRANSPORTATION	.0730289	.041224	.032430	.0533956	.086583	.079463	.046126	.045201	.049780	.043500
27	COMM. UTIL.	.075996	.017451	.025376	.031507	.027261	.024632	.025292	.025280	.022263	.029244
28	WH. & RET. TRADE	.039787	.104066	.088099	.105193	.108752	.084770	.062289	.079525	.047567	.071845
29	FIN., INS., REAL EST.	.180913	.033017	.067207	.067951	.037698	.064893	.035938	.041253	.098752	.042193
30	SERVICES	.061903	.084392	.043741	.069924	.074110	.070723	.075643	.074344	.045755	.036782
31	GOV'T ENT.	.011872	.005015	.004894	.007044	.007062	.006324	.007504	.095999	.004527	.006380
32	SCRAP	.008329	.001398	.000819	.001304	.001613	.001497	.000719	.000730	.004245	.001473
33	SUB-TOTAL	1.639719	1.671491	2.608161	2.868667	1.938533	2.134911	1.757384	1.865659	2.273817	1.861028

(DOLLARS)

APPENDIX TABLE 1.3. DIRECT AND INDIRECT EFFECTS OF \$1 INCREASE IN FINAL PURCHASES FOR SPECIFIED INDUSTRY OUTPUT IN TWO-REGION INPUT-OUTPUT SYSTEM: MINNESOTA INTERMEDIATE PURCHASES OF SPECIFIED MINNESOTA GROSS OUTPUT, BY PURCHASING SECTOR, 1972 (CONTINUED).

INDUSTRY	21	22	23	24	25	26	27	28	29	30
1 DAIRY FARM	.006412	.000554	.000119	.000209	.000292	.000366	.000137	.003495	.000133	.000914
2 POUL., EGGS	.000700	.000431	.000103	.000223	.000278	.000278	.000153	.002292	.000105	.000758
3 MEAT ANI.	.020165	.003716	.000647	.001468	.002175	.001542	.000561	.014509	.000624	.003106
4 FOGG, FEED	.024084	.002339	.000425	.001095	.001061	.002116	.000688	.006378	.000472	.002908
5 VEGETABLES	.014675	.000201	.000061	.000155	.000149	.000200	.000063	.002099	.000067	.000356
6 SUGAR CROPS	.001133	.000088	.000009	.000021	.000029	.000033	.000011	.000134	.000014	.000032
7 OIL-SEEDING	.024952	.010003	.000015	.000221	.000273	.000165	.000232	.000560	.000083	.000243
8 OTHER CROPS	.009630	.001399	.000004	.000155	.000439	.000149	.000135	.000291	.000433	.000221
9 FOR., FISH.	.000473	.000227	.000032	.000175	.000507	.000044	.000021	.000249	.000023	.000092
10 AGR., FOR., FISH.	.001304	.000660	.000206	.000319	.000357	.000281	.001504	.001016	.002044	.000664
11 MINING	.001294	.009194	.055644	.001410	.004003	.002173	.000783	.000754	.000720	.001256
12 CONSTRUCTION	.009098	.013131	.025365	.007666	.010407	.053591	.044657	.011449	.052589	.019006
13 MEAT PRODUCTS	.009089	.004930	.000912	.002116	.003114	.002353	.000667	.022031	.000735	.003341
14 DAIRY PRODUCTS	.010598	.001545	.000339	.000631	.000033	.001943	.000355	.010332	.000333	.002536
15 FRUIT & VEG. PROD.	.034397	.001650	.000229	.000513	.000516	.001759	.000203	.006251	.000216	.001312
16 GRAIN MILL PROD.	.059425	.001543	.000151	.001625	.000386	.000397	.000218	.003366	.000374	.000937
17 BAKERY	.007724	.000220	.000088	.000226	.000215	.000295	.000218	.003170	.000101	.000477
18 SOYBEAN PROD.	.013062	.000991	.000093	.000226	.000293	.000275	.000078	.003170	.000101	.000313
19 SOYBEAN, VEG. OIL	.006227	.013847	.000162	.000289	.000349	.000149	.000114	.000652	.000058	.000256
20 ALCOH. BEV., SOFT DR.	.004200	.000539	.000179	.000539	.000565	.000449	.000154	.007570	.000165	.000452
21 MISC. FOOD., TOB.	1.021392	.000375	.000089	.000220	.000217	.000315	.000080	.002821	.000084	.000590
22 CHEM. & ALLIED	.016755	1.129397	.017173	.007809	.026410	.003619	.003387	.002777	.001707	.062132
23 PETR. REF. & PROD.	.006759	.023269	.000120	.004635	.006316	.029085	.014997	.006314	.003335	.006737
24 FARM MACH.	.001027	.000468	.000120	.004635	.001675	.000174	.000117	.000323	.000234	.001061
25 OTHER MFG.	.162908	.103447	.057871	.394640	1.382300	.061450	.035523	.044265	.039434	.167280
25 TRANSPORTATION	.059000	.351574	.061795	.029415	.041704	.1115219	.015639	.021282	.007626	.023583
27 COMM., UTIL.	.023398	.038219	.033090	.021244	.027310	.020280	1.149360	.035148	.020089	.056674
28 WH. & RET. TRADE	.072403	.056649	.022495	.068751	.063292	.045645	.019528	1.043736	.020918	.044476
29 FIN., INS., REAL EST.	.040741	.050365	.032002	.027037	.039107	.049308	.036729	.061078	1.143545	.071512
30 SERVICES	.039520	.126726	.040329	.056186	.061864	.079615	.056546	.088539	.059020	1.108374
31 GOV'T ENT.	.006039	.007715	.005753	.005590	.007070	.027024	.077362	.014394	.010852	.013046
32 SCRAP	.001000	.002097	.000679	.004213	.004884	.000343	.000215	.000239	.000171	.000910
33 SUB-TOTAL	1.801184	1.737567	1.412944	1.672583	1.682548	1.505698	1.508353	1.419925	1.366310	1.540974

(DOLLARS)

23 APPENDIX TABLE 1.3. DIRECT AND INDIRECT EFFECTS OF \$1 INCREASE IN FINAL PURCHASES FOR SPECIFIED INDUSTRY OUTPUT IN TWO-REGION INPUT-OUTPUT SYSTEM: MINNESOTA INTERMEDIATE PURCHASES OF SPECIFIED MINNESOTA GROSS OUTPUT, BY PURCHASING SECTOR, 1972 (CONCLUDED).

INDUSTRY	NAMES	31	32	33
1	DAIRY FARM	.000371	.000180*	.405E+06
2	POUL.,EGGS	.000155	.000169*	.110E+06
3	MEAT AN.	.000912	.001305*	.120E+07
4	FOOD, FEED	.004427	.000681*	.606E+05
5	VEGETABLES	.000105	.000092*	.261E+05
6	SUGAR CROPS	.000015	.000018*	.874E+04
7	OIL-DEARING	.002169	.000166*	.177E+06
8	OTHER CROPS	.000237	.000256*	.178E+05
9	FOR.,FISH.	.000038	.000338*	.624E+04
10	AGR.,FOR.,FISH.	.000655	.000216*	.647E+05
11	MINING	.002065	.002664*	.866E+05
12	CONSTRUCTION	.101258	.007807*	.474E+06
13	HEAT PRODUCTS	.001019	.001860*	.334E+05
14	DAIRY PRODUCTS	.001001	.000514*	.465E+05
15	FRUIT & VEG. PROD.	.000295	.000323*	.688E+05
16	GRAIN MILL PROD.	.001123	.000243*	.239E+05
17	BAKERY	.000116	.000134*	.199E+05
18	SUGAR PROD.	.000149	.000181*	.450E+05
19	SOYBEAN, VEG. OIL	.000588	.000211*	.823E+05
20	ALCH. BEV.,SOFT DR.	.000238	.000339*	.516E+05
21	HISC. FOOD.,TOB.	.000128	.000135*	.270E+05
22	CHEM. & ALLIED	.008112	.011887*	.271E+05
23	PETR. REF. & PROD.	.013545	.009370*	.219E+06
24	FARM MACH.	.000331	.005362*	.406E+05
25	OTHER MFG.	.070538	.793345*	.401E+07
26	TRANSPORTATION	.067586	.059817*	.786E+06
27	COMM., UTIL.	.076752	.016759*	.825E+06
28	MH. & RET. TRADE	.029631	.038048*	.132E+07
29	FIN.,INS.,REAL EST.	.039669	.024189*	.156E+07
30	SERVICES	.060127	.038333*	.170E+07
31	GOV'T ENT.	1.009284	.004954*	.271E+06
32	SCRAP	.000315	1.002824*	.407E+05
33	SUB-TOTAL	1.492953	2.023734*	.155E+08

(DOLLARS)

APPENDIX TABLE 1.4. DIRECT AND INDIRECT EFFECTS OF \$1 INCREASE IN SPECIFIED INDUSTRIES INPUT IN TWO-REGION INPUT-OUTPUT SYSTEM: MINNESOTA INTERMEDIATE DISBURSEMENTS OF SPECIFIED MINNESOTA GROSS OUTPUT, BY PURCHASING SECTOR, 1972.

INDUSTRY	1	2	3	4	5	6	7	8	9	10
1 DAIRY FARM	1.002775	.001077	.010022	.0133255	.000087	.000032	.001006	.000031	.000006	.001312
2 POULTRY EGGS	.006007	1.005115	.017961	.019399	.000909	.000031	.005660	.000294	.000041	.025436
3 MEAT AN.	.005378	.001919	1.374281	.027594	.000361	.000271	.004645	.000158	.000159	.003118
4 FLOW, FIELD	.162664	.038124	.499597	1.038933	.000275	.000164	.0002291	.000107	.000069	.005230
5 VEGETABLES	.002110	.001636	.007721	.002773	1.014413	.000135	.000797	.000136	.000029	.006058
6 SUGAR CROPS	.004646	.002780	.013299	.001676	.000198	.000092	.0003532	.000070	.000748	.005871
7 OIL-BEARING	.025135	.015384	.077224	.033222	.000145	.000652	.003710	.000057	.000020	.002897
8 OTHER CROPS	.027208	.011795	.077224	1.25691	.022633	.000652	1.060038	.027333	.016589	.036333
9 FCR, FISH.	.005192	.003292	.013892	.006281	.000541	.000247	.001656	.000272	1.000753	.006251
10 AGR. FOR. FISH.	.157155	1.67143	.360087	1.80726	.030143	.014531	.072539	.010009	.001351	1.023169
11 MINING	.001722	.000490	.004804	.007482	.000229	.000133	.001024	.000122	.000014	.000216
12 CONSTRUCTION	.033213	.000833	.007969	.005076	.000245	.000189	.001771	.000105	.000011	.000535
13 MEAT PRODUCTS	.000748	.000443	.002337	.000702	.000959	.000022	.000157	.000030	.000005	.000064
14 DAIRY PRODUCTS	.000748	.000514	.001783	.004922	.000041	.000015	.000110	.000021	.000004	.000064
15 FRUIT & VEG. PROD.	.001518	.001023	.003795	.001172	.000095	.000036	.000263	.000049	.000012	.000147
16 GRAIN MILL PROD.	.115716	.096885	.214009	.003443	.000177	.000094	.001443	.000067	.000066	.003359
17 BAKERY	.001016	.000526	.003443	.001666	.000151	.000050	.000366	.000079	.000014	.000073
18 SUGAR PROD.	.025511	.007212	.044180	.002566	.000112	.000053	.000479	.000055	.000023	.000073
19 SOYBEAN, VEG. OIL	.047349	.028775	.131897	.005260	.000145	.000112	.000986	.000063	.000027	.001177
20 ALCH. BEV., SOFT DR.	.002716	.000662	.005600	.001280	.000112	.000036	.000269	.000057	.000008	.000035
21 MISC. FOOD, TOB.	.002630	.001654	.005139	.001627	.000135	.000048	.000358	.000070	.0000472	.000210
22 CHEM. & ALLIED	.016364	.004215	.037455	.057494	.0003067	.002871	.012643	.001431	.000138	.002034
23 PETR. REF. & PROD.	.017594	.005258	.048472	.059338	.001742	.001298	.015680	.001431	.000271	.003225
24 FARM MACH.	.022126	.004646	.001646	.048149	.001377	.001112	.016883	.001108	.000034	.002280
25 OTHER MFG.	.002299	.001219	.065379	.003701	.000229	.000311	.000980	.000155	.000036	.000987
26 TRANSPORTATION	.019100	.004666	.025955	.014734	.000788	.009402	.002623	.000364	.000038	.002864
27 COMM. UTIL.	.007840	.002753	.023724	.011113	.000449	.000243	.002115	.000397	.000044	.001363
28 MIN. & PET. TRADE	.004020	.002494	.017548	.000545	.000012	.000255	.001023	.000414	.000051	.003517
29 FIN., INS., REAL EST.	.010613	.002491	.029962	.027984	.000902	.000987	.009197	.000386	.000046	.001886
30 SERVICES	.004832	.002654	.013427	.008868	.000432	.000283	.002739	.000281	.000076	.001897
31 GOV'T ENT.	.006060	.002116	.015573	.009021	.000453	.000263	.002233	.000263	.000047	.001499
32 SCRAP	.007144	.003399	.017182	.000691	.000451	.000260	.002141	.000274	.000329	.001568
33 SUB-TOTAL	1.724766	1.423614	3.175712	1.712093	1.002400	1.063107	1.229129	1.045523	1.021673	1.140574

(DOLLARS)

APPENDIX TABLE 1.4. DIRECT AND INDIRECT EFFECTS OF \$1 INCREASE IN SPECIFIED INDUSTRIES INPUT IN TWO-REGION INPUT-OUTPUT SYSTEM: MINNESOTA INTERPRETIVE DISBURSEMENTS OF SPECIFIED MINNESOTA GROSS OUTPUT, BY PURCHASING SECTOR, 1972 (CONTINUED).

INDUSTRY	NAHES	11	12	13	14	15	16	17	18	19	20
1 DAIRY FARM		.000252	.002479	.015527	1.202505	.003163	.005788	.001369	.001659	.000730	.001912
2 POUL., EGGS		.000796	.007372	.056982	.011614	.006398	.005587	.000828	.000331	.007041	.001077
3 MEAT AN.		.000468	.004719	1.037718	.009714	.007487	.006935	.000946	.002259	.007333	.001153
4 FODD, FEED		.000418	.003480	.409769	.196898	.004361	.146405	.004235	.000565	.006640	.027564
5 VEGETABLES		.001077	.011259	.013024	.006594	.244102	.003961	.001204	.000962	.001030	.002569
6 SUGAR CROPS		.000261	.002475	.013034	.029154	.013957	.020837	.007381	.009484	.003567	.015300
7 OIL-BEARING		.000448	.002121	.070294	.031348	.001950	.100190	.003262	.005408	.546413	.086958
8 OTHER CROPS		.003565	.077967	.071889	.039976	.133818	.030167	.003722	.018304	.032537	.037285
9 FOR., FISH.		.008527	.096820	.024571	.026049	.285924	.012859	.002309	.001633	.027630	.011251
10 AGR., FOR., FISH.		.004982	.029693	.413737	.192693	.013146	.034956	.001773	.005428	.040502	.006636
11 MINING		1.023544	.035200	.084732	.003626	.000723	.001899	.000168	.000183	.000774	.000835
12 CONSTRUCTION		.008732	1.007238	.068301	.006533	.001336	.002375	.000351	.000328	.001334	.001229
13 MEAT PRODUCTS		.000461	.004802	1.122970	.004179	.007448	.002875	.000877	.000132	.005314	.006439
14 DAIRY PRODUCTS		.000302	.003015	.003074	1.531667	.003875	.004937	.001694	.002094	.000154	.001869
15 FRUIT & VEG. PROD.		.000719	.007000	.017720	.004729	1.074573	.009225	.003422	.001279	.001834	.007943
16 GRAIN HILL PROD.		.000308	.002708	2.44014	.140609	.006972	1.150309	.027707	.001352	.002076	.005188
17 BAKERY		.001026	.011032	.005848	.009578	.010634	.001958	.001958	.001045	.000448	.000917
18 SUGAR PROD.		.000880	.008719	6.1921	.110017	.053584	.080918	.031257	1.213848	.013015	.058654
19 SOYBEAN, VEG. OIL		.000706	.003470	.131279	.053074	.092919	.191453	.005648	.006632	1.049372	.031269
20 ALCH. BEV., SOFT DR.		.000707	.008023	.006712	.011778	.004436	.004784	.000343	.000738	.000327	1.029416
21 HISC. FOOD., TOB.		.000968	.009958	.032733	.031365	.029637	.015752	.0011907	.021130	.003792	.004951
22 CHEM. & ALLIED		.023006	.091940	.038884	.032073	.007949	.017269	.001663	.002018	.008828	.006185
23 PETR. REF. & PROD.		.020328	.123448	.048555	.036875	.006302	.015473	.001876	.001782	.010187	.005916
24 FARM MACH.		.000980	.007456	.050864	.028217	.001688	.008888	.000408	.000581	.009212	.002128
25 OTHER MFG.		.010271	.111223	.011754	.024979	.010124	.004706	.001429	.001282	.001111	.012102
26 TRANSPORTATION		.012968	.078541	.037121	.041605	.017952	.024563	.002741	.002607	.007703	.008187
27 COMM., UTIL.		.034319	.035068	.030636	.025624	.005962	.006031	.001585	.001538	.003634	.005305
28 WH. & RET. TRADE		.004892	.056940	.028961	.023294	.006476	.007525	.001063	.001317	.002114	.003340
29 FIN., INS., REAL EST.		.028274	.022962	.028081	.019126	.002853	.007322	.000780	.000968	.005578	.002399
30 SERVICES		.009691	.058791	.018307	.019715	.005619	.007994	.001648	.001568	.002589	.006661
31 GOV'T ENT.		.020413	.038370	.022497	.021815	.005881	.007851	.001791	.001389	.002613	.004822
32 SCRAP		.208509	.155757	.054849	.058785	.019556	.027065	.002497	.002462	.038410	.016211
33 SUB-TOTAL		1.432800	2.114130	4.916363	3.990753	1.971067	1.970837	1.135777	1.604178	1.841000	1.292541

(DOLLARS)

APPENDIX TABLE 1.4. DIRECT AND INDIRECT EFFECTS OF \$1 INCREASE IN SPECIFIED INDUSTRIES' INPUT IN TWO-REGION INPUT-OUTPUT SYSTEM: MINNESOTA INTERMEDIATE DISBURSEMENTS OF SPECIFIED MINNESOTA GROSS OUTPUT, BY PURCHASING SECTOR, 1972 (CONTINUED).

INDUSTRY	21	22	23	24	25	26	27	28	29	30
1 DAIRY FARM	.001230	.000530	.030088	.000109	.005024	.001130	.000401	.037596	.001123	.007726
2 POUL., EGGS	.000577	.001575	.000290	.000322	.018320	.003279	.001717	.094195	.005970	.024454
3 MEAT AN.	.001559	.001433	.000193	.000223	.015111	.002045	.000662	.062912	.002130	.010577
4 FOCOD, FEED	.002630	.001274	.000179	.000235	.010407	.003721	.001147	.039051	.002275	.013982
5 VEGETABLES	.022999	.001569	.000369	.000477	.020788	.005042	.001513	.184376	.004645	.024503
6 SUGAR CROPS	.003608	.001403	.000167	.000133	.008269	.001710	.000526	.023908	.001986	.004427
7 OIL-BEARING	.007649	.015290	.000962	.000133	.007505	.000816	.001086	.009622	.001126	.003280
8 OTHER CROPS	.030895	.022387	.001033	.000961	.126206	.007695	.006629	.052307	.061326	.031239
9 FOR., FISH.	.008731	.020868	.002293	.006376	.973542	.012981	.005832	.257502	.018686	.074657
10 AGR., FOR., FISH.	.002745	.004744	.001156	.000905	.046278	.005223	.033089	.082298	.129973	.054638
11 MINING	.000180	.006650	.031063	.000402	.053195	.005076	.017351	.006135	.004606	.008025
12 CONSTRUCTION	.000345	.002135	.000382	.000492	.030470	.023129	.022223	.020924	.075619	.027282
13 MEAT PRODUCTS	.000493	.001336	.000190	.000226	.015176	.002056	.000553	.067019	.001759	.009417
14 DAIRY PRODUCTS	.001504	.003620	.000105	.000132	.006023	.001352	.000436	.046657	.001181	.009348
15 FRUIT & VEG. PROD.	.010303	.002465	.000264	.000302	.013987	.003661	.000929	.104983	.004983	.023306
16 GRAIN MILL PROD.	.012040	.001546	.000116	.000721	.006964	.001284	.000669	.037911	.001546	.008289
17 BAKERY	.008973	.001147	.000352	.000469	.020160	.004959	.001247	.185767	.003782	.021950
18 SUGAR PROD.	.014065	.005321	.000385	.000479	.028332	.003494	.001297	.091074	.004812	.014822
19 SOYBEAN, VEG. OIL	.003392	.027212	.01794	.000228	.012590	.009062	.000700	.014681	.001025	.004766
20 ALCH. BEV., SOFT DR.	.001385	.000969	.000228	.000350	.015751	.002193	.000777	.146051	.002416	.006720
21 MISC. FOOD., TOB.	1.021392	.001871	.000344	.000433	.019455	.005065	.001229	.158191	.003684	.025965
22 CHEM. & ALLIED	.003761	1.129397	.013253	.000381	.367636	.041686	.010369	.031227	.015097	.071310
23 PETR. REF. & PROD.	.001756	.030150	1.053244	.002369	.147741	.117504	.059487	.091579	.038797	.077035
24 FARM MACH.	.000522	.001185	.000236	1.043076	.076518	.001421	.0003908	.009207	.005244	.023742
25 OTHER MFG.	.002037	.010185	.002480	.008425	1.382300	.011016	.006038	.027630	.019366	.082011
26 TRANSPORTATION	.001669	.0145972	.014760	.003594	.232641	1.115219	.015776	.074105	.020891	.061760
27 COMM., UTIL.	.001572	.012484	.008544	.002738	.160603	.029020	1.189360	.129086	.058046	.166593
28 WH. & RET. TRADE	.001293	.005030	.001544	.002412	.101396	.013109	.005317	1.043736	.015457	.034932
29 FIN., INS., REAL EST.	.000924	.005694	.002869	.001206	.079630	.017999	.012711	.078650	1.143545	.071330
30 SERVICES	.002169	.014351	.003525	.002510	.126186	.029111	.019603	.112729	.059121	.110374
31 GOVT ENT.	.001506	.009596	.005522	.002743	.158397	.108531	.294568	.201293	.119401	.143290
32 SCRAP	.003630	.037978	.009491	.030039	1.593017	.020031	.011937	.048694	.027423	.145471
33 SUB-TOTAL	1.178555	1.394874	1.160161	1.116381	5.880270	1.591624	1.726085	3.565497	1.855834	2.390672

(DOLLARS)

APPENDIX TABLE 1.4. DIRECT AND INDIRECT EFFECTS OF \$1 INCREASE IN SPECIFIED INDUSTRIES INPUT IN TWO-REGION INPUT-OUTPUT SYSTEM: MINNESOTA INTERMEDIATE DISBURSEMENTS OF SPECIFIED MINNESOTA GROSS OUTPUT, BY PURCHASING SECTOR, 1972 (CONCLUDED).

INDUSTRY	NAHES	31	32	33
1	DAIRY FARM	.000285	.000010	2.328128
2	POUL., EGGS	.000455	.000034	2.130137
3	HEAT AN.	.000283	.000028	2.591771
4	FOOD, FEED	.001938	.000020	2.624590
5	VEGETABLES	.000657	.000040	1.588555
6	SUGAR CROPS	.000189	.000016	1.532692
7	OIL-BEARING	.002666	.000014	1.989966
8	OTHER CROPS	.003053	.000226	2.112375
9	FOR., FISH.	.002825	.001716	2.915971
10	AGR., FOR., FISH.	.003784	.000086	3.126743
11	MINING	.001201	.000106	1.221908
12	CONSTRUCTION	.013234	.000070	1.282610
13	MEAT PRODUCTS	.000222	.000026	1.252563
14	DAIRY PRODUCTS	.000323	.000011	1.624166
15	FRUIT & VEG. PROD.	.000354	.000027	1.300317
16	GRAIN MILL PROD.	.000904	.000013	2.093723
17	BAKERY	.000486	.000038	1.305675
18	SUGAR PROD.	.000642	.000054	1.862259
19	SOYBEAN, VEG. OIL	.000946	.000023	1.729285
20	ALCH. BEV., SOFT DR.	.000314	.000031	1.250695
21	MISC. FOOD., TCB.	.000514	.000037	1.410615
22	CHEM. & ALLIED	.006522	.000656	2.032042
23	PETR. REF. & PROD.	.014110	.000671	2.059450
24	FARM MACH.	.000674	.000091	1.433725
25	OTHER MFG.	.003149	.002432	1.761175
26	TRANSPORTATION	.016829	.001023	1.881022
27	CCNM., UTIL.	.020157	.000302	1.975635
28	WH. & RET. TRADE	.002119	.000187	1.401543
29	FIN., INS., REAL EST.	.003606	.000151	1.620748
30	SERVICES	.005474	.000240	1.651460
31	GOV'T ENT.	1.009284	.000340	2.219342
32	SCRAP	.004593	1.002824	3.561330
33	SUB-TOTAL	1.121794	1.012346	.403403

(DOLLARS)

Summary and Conclusions

Long-term regional viability and prosperity depends on a region's economic base -- its export-producing industry. In Minnesota, a wide range of industries contribute to this base by sales to out-of-state markets.

The economic importance of export-producing industry varies, depending upon the criterion of importance. In value of gross output agriculture and food products manufacturing -- both important in Minnesota's economic history -- accounted for 8.5 percent and 11.7 percent, respectively, of the State total in 1972. In value added, these percentages were even smaller -- 6.6 and 4.1. When measured by the value of exports, however, the two industries increased in importance, accounting for 7.2 percent and 29.4 percent, respectively, of the State total. Agriculture-related industry was, indeed an important recipient of income received from sources outside the State.

State economic effects of agriculture-related industry are represented by demand and supply multipliers, both short-term and long-term. Short-term demand multipliers for 19 agriculture-related industries range from 1.568 for other crop production to 2.869 for dairy products manufacturing, while short-term supply multipliers range from 1.411 for alcoholic beverages and soft drinks manufacturing to 3.127 for agriculture, forestry and fishery services. Size of multiplier is directly related to the forward and backward linkages of these industries in Minnesota -- the larger the internal, in-state linkage, the larger the multiplier.

Long-term multipliers are presented, also, to show long-term effects of changes in export demands. In this report, the long-term multipliers apply only to export-producing industries and they show, at best, certain upper limits of economic impact. They are much larger in value than the corresponding short-term multipliers.