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THE LONG ISLAND NORTH FORK STUDY[1]

by David J. Allee[2]

This paper will give a brief summary of Cornell's Experiment Station Project in Southold Township on Long Island, but will particularly emphasize the use of an input-output study of the structure of the economy of that township. Proceding papers in this session have discussed the use of the National input-output table and the development of subsidiary tables for large regions in the nation.[3] Also, a discussion has been presented of a table being prepared for a region smaller than those into which the nation will be divided and yet still substantially larger than the region to be discussed here.[4] In each case, considerable attention has been given to the usefulness of such studies in the planning process. Our project was developed to explore three areas important in local planning.

The Three Parts of the North Fork Study

It would be tempting to call the North Fork Study an example of inter-disciplinary research. It probably does represent what can realistically be achieved by researchers from several disciplines. We have been conducting what amounts to three concurrent studies, all oriented to providing information which would serve as a basis for local planning as well as making a useful contribution to the three disciplines involved. The study was supported in part by funds from the "701" planning program with a contract between the New York State College of Agriculture at Cornell University and the Bureau of Planning of the State of New York.

The Sociologist on the team, Robert Carroll, carried out an investigation of the characteristics of the local population and their attitudes towards development with some attention to the spatial relations of the population. This involved some preliminary work to determine what was envisioned by the leadership as the relevant goals and issues connected with development. A five percent sample of all households was completed and some further investigation of the leadership structure was carried out. One publication has resulted from this part of the study.[5]

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1. This article reports on research carried out by the author and David W. Morton and is reported in greater detail in Morton's M. S. Thesis entitled "An Intersector Study of Transactions in a Small Fishing, Farming, and Summer Recreation Region".

2. Associate Professor of Resource Economics, Department of Agricultural Economics, New York State College of Agriculture, a contract unit of the State University of New York at Cornell University, Ithaca, New York.

3. "Regional or Sub-Regional Input-Output Analysis," by Dr. Karen Polenske, Harvard Economic Research Project.

4. "The Maine-New Hampshire Seacoast Region Project, " by Dr. William Henry and others, University of New Hampshire.

5. Carroll, Robert L., A Social Analysis of Southold Town, Long Island, Dept. of Rural Soc., Cornell University, Ithaca, New York, Bul. 66, Oct. 1965.

The biologist, Bruce Wilkins, investigated the use of the natural resources of the area except agriculture. A significant portion of his study was the development of measurement techniques and he also made an evaluation of the capacity of the resources to provide services as well as some identification of the conflicts in resource use.

As the economist in the group, it was my plan to make an economic classification of the land for farm use and to carry out an evaluation of the pressures of non-farm development on the viability of agriculture. Data has been collected to construct a land valuation model with emphasis on the land not yet developed for non-farm purposes. Reports on both of these phases are currently in preparation. But the portion of the study of greatest interest here was the development of the structural model of the economy.

Description of the North Fork Region

We chose this area for such intensive study because it combined a number of rural activities of current interest. First, it contains a viable agriculture. There are some 145 farms in the township producing about 5.3 million dollars worth of output, primarily potatoes. Some $36,000 of sales and 2.6 man-equivalents per farm place this township in the upper brackets of farm size in New York and the Northeast in general. While these farms have undergone a longstanding pressure of non-farm growth, it is not really of the suburban type.

The pressure on agriculture comes largely from the very mature recreation sector in the economy. Recreation activity here, exploiting the excellent boating waters and beaches, goes back to the days when railroad travel was more important than it is today. As we shall see, part-time residents are an important part of the economy. Part-time residences number some 3409 out of a total of 7878 residences in the township or 43 percent. A recreation economy is developing in many of our rural areas and is being actively promoted by many public agencies as the answer for those who desire greater economic activity in rural areas.

In addition to these two sectors there is a significant fishing industry in the town as well as a measurable manufacturing sector. To round out the picture, the town also enjoys the opportunities afforded by a federal installation of some size.

Also, adding to our interest has been the prospect of obtaining some significant information on the "before" situation with respect to a proposed bridge connecting the end of Long Island with the mainland, perhaps at some point near the Connecticut-Rhode Island line.

The North Fork of Long Island is approximately 25 miles long and 3 to 5 miles wide. While Fisher's Island is technically in the town, we felt it too atypical to be reasonably included in the study and furthermore, all of its transactions are with the Connecticut mainland except for a few town activities.

The center of the town is approximately 100 miles from New York City with current non-rush hour driving time being about two hours. Extension of the Long Island Expressway will cut that time slightly.

The population of the township in 1964 was 14,544. The pattern of population growth since 1920 probably represents its high degree of isolation and the decline in that isolation as populations increase in general and as transportation improvements occur. From 1920 to 1950 it enjoyed an 11.5 percent rise in population for an average annual rate of less than 0.38 percent. Between 1950 and 1960 the population increased 14.3 percent for the 1.4 percent average per year. In the four years 1960 to 1964, it is our estimate that population increased 9.4 percent or an annual average of 2.3 percent. We expect this increase in the rate of growth to continue.

Our information about house construction indicates that the proportion of part-time residence to permanent residence is holding fairly steady. However, the composition of the permanent residence group is changing. In 1963, 83 homes were built for people classified as permanent residents. These had a value, exclusive of the value of the lot, of $17,480 and most of them were located in the inland portions of the island. This is a rate of growth of 1.85 percent for homes occupied by permanent residents. At the same time, 73 homes, or 2.14 percent, were built for part-time residents and largely located along the coast. The average value, again exclusive of the lot, was almost exactly the same at $17,600. While 43 percent of the places of habitation in the township are currently used by part-time residents and 47 percent of the new construction is for that group, this difference does not imply a shift towards part-time residents. This is because there is a significant change each year from the part-time status to the permanent resident status as people retire. It is in this way that the composition of the permanent resident group is changing. More and more are retirees.

As might be expected, there is a significant degree of seasonality to the economy. At the present time, we have not determined a standard against which to compare the degree of seasonality which we have measured for this township. A visit to the township in January and February, with a comparison during the summer, presents a startling contrast. In the one third of the year represented by June, July, August and September, 41.5 percent of the annual volume of non-farm business occurs. In these same four months, 38.8 percent of all man-equivalents used in the local economy are employed. This would seem to imply something on the order of a 20 percent excess capacity in the other eight months of the year.

About one in six of the man-years used in the township were short-term employment. Short-term employment, by our definition, was less than 10.5 months of work at a continuous stretch. By this definition, which we felt would be quite strict, we found 655 full-time man-equivalents in short-term employment out of the total of 4,144 for the year 1963. Of this, 409 man-years of short-term employment, (including 97 on farms) occurred in the June to September period. Total employment for June to September was 1,562 man-equivalents. Thus, one third of all employment during the summer months fell in our classification of short-term.

The Input-Output Table

Table I shows the transactions between firms and other entities within and between 18 endogenous sectors and two exogenous sectors. Refer to the appendix for a more complete identification of what was included in each sector. This data was collected by sampling these firms and asking them to allocate their sales and costs between the 20 sectors indicated. Therefore, these are the most solid estimates that we obtained. However, we did break down our data collection into 84 identification groups and have prepared a flow table utilizing 54 sub-sectors. This 54 sub-sector table will not be published because of disclosure problems.

We sampled 356 firms out of a total of 866 in the 13 "commercial" sectors. This was at a sampling rate of between 30 percent and 68 percent in each sector. In addition, data was collected from the federal installation and a sample of the post offices. All sales and receipts of local governments were obtained plus a sample of their input structure. A fairly complete enumeration of non-profit activities was made and a sample taken of these. In addition, we had an opportunity to utilize information made from the five percent sample of all permanent and seasonal residences. While this may seem to be a fairly complete enumeration on the activities in the township, we still were forced to rely on a great deal of "catch as catch can" data and the final putting together of the table represented a long series of judgments applied to many, many decisions.

You will note that Table I contains no identification of investments. Investments are always a headache in the construction of input and output tables for small areas. One unusual investment activity, such as a new road or a new factory, can have a significant impact on transaction flows in many sectors. We were fortunate in that no such "unusual" investment activity took place during the year from which the data were collected. Of course, the construction sector represents a significant part of any investment activity. This sector is identified in our table. By and large, investments made by the individual sectors are shown as transactions with the household sector and returns to investment are lumped together with wages, profits and rents. In some cases, where we felt that current transactions with the household sector were an insufficient indication of the long run average rate of "normal" investments, extra depreciation charges, etc., were used, and shown as transactions with permanent residents.

You will note that imports equal exports. This was forced in our calculations and a residual error of approximately five million dollars in transactions has been dropped from the table. In other words, the import and export figures not only represent estimates of the actual imports and exports of each of the sectors, but also represent a correctional device to make the data fit the model. We believe that the estimates of imports and exports for each of the sectors is as accurate as possible and that all of the "statistical correction" is in the household sector.

Enough on the construction of the table. Let us turn our attention to some of the information which it contains.

One of the continuing concerns of planners and others interested in the structure of local economies has been the identification of those activities that are considered basic to the economy.[6] In other words, these are the activities which "bring wealth to the community." Of the total sales of all firms and similar entities in the township, which amounted to $122,420,000; $46,655,000 can be considered basic. In this context of the basic non-basic idea, 38 percent of all transactions were "necessary" in order that the other 62 percent might take place. For Los Angeles in 1960, a comparable percentage was 27 percent.[7]

This high portion of basic activities should come as no surprise. As economic size increases, the portion of export and import activities falls. The region becomes more self-sufficient. Therefore, one would expect that a smaller region will have more employment, more business devoted to exports and, conversely, will be more dependent upon imports for inputs and consumption. Economies of scale are at work.

But isolation could be expected to work in the opposite direction. The more costly imports are to bring in, comparing one region to another, the more self-sufficiency becomes feasible. Transport costs now offset some of the scale disadvantages of a small region. To date we have not found a means of appraising the apparent isolation of the North Fork in terms that are meaningful in evaluating the basic to non-basic ratio.

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6. See Charles M. Tiebout, The Community Economic Base Study, Supplementary Paper No. 16, Committee for Economic Development, New York, December 1962.

7. op. cit., p. 33.

Another factor to consider in comparing the results of one economic base study to another is the methodology. The input-output table seems a rather precise tool compared to employment classifications or various location quotient methods, such as the minimum requirements approach.[8] Another consideration is the completeness of the enumeration. Perhaps more non-basic activities are omitted than basic activities. We probably "found" more non-basic transactions than is usual.

The most common use of the basic to non-basic ratio appears to be as a means of improving projections. Not that such knowledge helps one to know what the rate of change might be in the future; rather, given a projection of exports from some other source, it gives some insight into the associated activities that can be expected. In this case, the gross ratio of 1.6 means that for every dollar of exports, assuming all mix and relations stay the same, there will be about $1.60 of other business inside the area.

The planner is not only interested in what could happen in the future, and what will probably happen, but also with what people may want to happen. His projections tend to be a blend of these sometimes contradictory points of view. It is in this sense that base analysis is most helpful. With an employment to sales ratio ($29,500 per man-equivalent), it is possible to arrive at a better estimate of the population that can be supported. Requirements for services, housing, etc. follow. With a space to sales ratio, land use for industrial, commercial and public purposes can be better estimated. Obviously, these can be accomplished with greater precision if such data can be handled on a sector by sector basis and if the variation in inter-relations between sectors can be suggested. It is here that the expense of an input-output table might find justification.

Of course, it is also a device for just describing the economy and, in this way, dispelling misconceptions about who does what and how much. Ignorance can be a useful situation for an interest group able to exploit it. Arguments about the contribution to the economy are often made to explain why a particular public action should be taken. Often, gross size is implied to be an appropriate indicator of marginal welfare effects. While the input-output table has some problems indicating convincing marginal relations, it may be as good a comprehensive macro-tool as we have.

Table II presents one approach for estimating the marginal impact of any and all sectors. Here the purchases of each sector are expressed as a proportion of a dollar of output. These are estimates of the direct effect of a change using the average input structure and also the average output mix. Any real change may involve a different output mix and this alone could cause a different input mix. Problems of excess capacity, particularly of labor, might also suggest some caution in using these figures without modification. But at least a sector to sector comparison that is independent of sector size is made possible. Retailers use 20 cents of local inputs for each dollar of sales, while Fishing uses 86 cents. But, of course, the Retail sector is so much larger that its local purchases are almost twice that of the Fishing sector.

The direct effect of a business, as any businessman at a hearing will point out, is only part of the story. Retailers hire people and these people spend their wages at local shops, supporting other employment in retailing. Fishermen need boat repairs; boatyards need inputs from wholesalers; wholesalers hire people who trade with retailers. Obviously, following these loops and links through Table II is a laborious, if possible, process. Table III presents these multiplier effects carried out to the point where all the effects on every sector are summed up. But it is expressed in a particular way.

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8. op. cit, pp 46-49.

Table III shows the effect of one dollar of sales to the outside world. It has all the limitations the Table II in that it assumes that average relationships hold at the margin and that mix is constant. It compounds some of these. For example, the fact that farm service firms both buy from and sell to farms means that the table assumes that for a farmer to export potatoes directly, he must sell some potatoes to the Farm Supply Sector so that the Farm Supply Sector can sell fertilizer to him. This kind of thing somewhat exaggerates the multiplier effect of direct Farm exports and of exports of the Farm Supply Sector by perhaps as much as 20 percent. It is almost impossible to know the full extent of this type of problem.

Where before we spoke of one dollar of basic or export activity "producing" $1.60 of other business, Table III expresses one dollar of exports "producing" $2.60 of total business, i.e., including the export transaction itself. The totals for each sector are an estimate of the total multiplier effect and clearly this varies greatly from sector to sector--from 1.5 for Retail to 3.7 for Farm.

The total local income effect of an export sale is estimated by the return to permanent residents and variability is very high here as well--from .2 for the exports of wholesalers to 1.38 for the export of labor itself. This figure is roughly comparable to the concept of value added in national income accounts and some census reports. Indirect benefits of some value to certain benefit-cost analysis problems could be estimated from these relations. It has also been suggested that more equitable cost-sharing schemes could be devised if such data were taken into account.

Another interesting possible use of these tables is to identify whose incomes might provide the incentive or motivation to choose one development strategy over another. Table I indicates the direct effects of the existing level of sales for the combined Farm and Farm Supply sectors. This amounts to a distribution over the various sectors, including exports, of some $12.2 million of transactions. Including indirect effects, another $5.9 million is involved and these can be identified by applying the values in Table III to the level of exports in Table I. This is presented in Table IV. Where $172,000 of business was indicated with Retail in the direct transactions, some $1.1 million can be seen to be actually at stake.

Another approach in considering the apparent importance of a sector with direct effects compared to indirect is to look at returns to resident households. When only direct incomes (from Table I) are considered, commutation, retirement incomes and similar items at $5.2 million shown as export earnings of the Residents Sector have the top ranking among groups shown in Table IV. This is followed by Federal employees (2.2), Farm and Farm Supply (2.2), Fish and Fish Processing (1.8), Manufacturing (0.9) and Seasonal Residents (0.2). With the consideration of indirect effects on Resident incomes, Seasonal People shift from last place to second and the magnitudes change markedly as indicated in Table IV.

Obviously, if one type of development is to be preferred over another by a public plan, factors other than the simple distribution of effects per dollar of exports must be considered. The total size of the change, the probability of it coming about without, or in spite of, local efforts, the degree to which beneficial effects can be enhanced and harmful effects mitigated, and many other factors must be evaluated. Not the least of all is the extent to which one activity precludes or reduces the chances of having the other. Planning for industrial expansion based upon a future transportation change may divert effort from programs that would enhance further seasonal and retirement residential development. The odds of the first occurring may be quite low relative to the second and there is little in an input-output analysis that helps estimate these probabilities. If industrial development does take place it might be so located and so controlled that conflicts with agriculture and recreational development would be minimized,

but certainly some trade-offs would be involved. Not only is space involved in this competition, but so is water. Again the limits of the community resource to provide services and the physical and operational substitution relationships between activities are not provided by this approach. Once such questions are decided by other analysis, an input-output analysis can help in estimating the effects, identifying who wins and who loses and how much.

In the input-output analysis, or as a result of the data collected to complete it, at least four kinds of effects can be identified: gross business impacts, gross local income impacts, average income impacts and local tax returns. When you assume a similar level of change, it is interesting how the sectors rank differently in each of these effects.

Gross multipliers are a first approximation of impact of a change in exports on the business life of the community. Exports of the combined Farm and Farm Supply sectors stand out in their gross effect; Seasonal People and Fish with Fish Processing are about tied for second. Manufacturing is a decided last place. These gross multipliers are listed in Table IV for each of six major export groups. However, it might be desirable to partition this multiplier to show the effect on a sub-set of the sectors. For this illustration the commercial sectors 01 to 07 were grouped with Construction and Non-Profit. Such a grouping might be more representative of those who take an interest in some local affairs than is the total multiplier. On this basis, the impact of a dollar of exports by each group is: Seasonal People (1.21), Commuters and Retirees (1.10), Fish and Fish Processing (0.78), Farm and Farm Supply (0.70), Federal Government (0.62) and Manufacturing (0.33). On this basis, four times the volume of manufacturing exports are needed to match the impact of the direct purchases of Seasonal People.

Gross local income effects represent returns to a different public, obviously overlapping, but still different than gross business effects. Since Commuter and Retiree "exports" count directly, their local income multiplier is by far the largest at 1.38. Fish with Fish Processing and Federal Government are both at about 0.72, with Farm and Farm Supply at 0.61 per dollar of exports. Seasonal and Manufacturing are at the bottom with 0.43 and 0.37 respectively. If the direct returns from Commuter and Retiree "exports" were ignored, they would rank at the bottom instead of the top.

But gross returns to local households are only a part of the concern for incomes. Also of interest is the effect on the mix of average incomes. Here the Federal Government, Manufacturing and Commuter sectors rank at the top, all with direct payments of about $5,700 per full-time man-equivalent. The Fish and Fish Processing sectors rank next with $4,600, and Farm and Farm Supply come next with something over $4,000. It should be noted that problems in handling retirement income, part-time farm operations and capital returns in farming have probably overestimated the first and understated the second. Note that these represent direct returns and do not have a multiplier component. At this writing, we have not worked out this computation, although it should be possible to make. A comparable figure for average direct payments from Seasonal People does not seem particularly relevant because the gross payment is so small, but with indirect effects included, an average income estimate would be of interest.

Always of interest to those concerned with local planning are the impacts on local government costs and revenues. Implicit in the input-output framework is that the money flows are a proxy for a flow of services and goods in the other direction. At least for the two government sectors and the non-profit sector this is only partly true. Local government revenues from County, State and Federal Government (over $1 million) are shown as "exports." Some revenues are indeed collected for the provision of specific inputs. The Village of Greenport operates an electric power enterprise; sewer and water,

for the most part, are sold to the users for charges roughly in proportion to their use. Trying to use input-output analysis to project government costs is probably of little value, but it may give some indication of revenues. Probably the largest source of trouble would be that real estate taxes may have limited responsiveness to changes in output. Higher volume through the same real estate could eventually be reflected in higher assessed values if the facilities were unique to the use and in limited supply. New facilities to provide expanded output could pay a higher or lower proportion of sales in taxes than old facilities depending upon many factors. Such problems could arise with any sector, but with the lack of a correcpondence between inputs and money flows it would seem most likely for the local government sector. Nonetheless, a sector by sector discussion is probably useful enough to be included.

Note that half of local government revenues are shown as from the Resident's Sector. This includes tax payments to local governments on rental property of all kinds, individually owned property, as well as residences and other revenues from local households. One-fifth of revenues were from some outside government. The remaining 30 percent was paid directly by business firms which counted their taxes as part of their operating costs. With so many owner-operated firms, there is probably a significant overstatement of taxes by the Resident's sector. Thus comparison of direct payments from Table I are probably of less significance than they might be in indicating what kinds of property apprear to be carrying the tax load. But where direct and indirect effects are evaluated, the results may be a bit closer to the mark, but even here with the funneling of taxes through households, there should be some tendency of the results to show high labor activities as carrying some of the taxes actually paid by real estate intensive activities.

For what they are worth, the direct and indirect effects on local government revenues per dollar of exports put Commuters and Retirees and Seasonal People at the top of the list with $0.12 and $0.11 respectively. Fish with Fish Processing and Farm with Farm Supply come next, both at $0.08, followed by the Federal Government at $0.062. Manufacturing again comes in last at $0.035.

Table V presents some of the above rankings for the important export sectors. Where judgement indicated that a difference was probably not significant, the average of the rankings involved was assigned to each sector. Rankings of absolute magnitudes (Gross Business or Direct Payments to Residents) certainly were not the same as the comparable multipliers (Gross Business Multipliers or Partition for Residents). But the rank from one to the other is rarely more than one place away and sectors vary considerably in the patterns which they make across the rankings. Manufacturing is either fifth or sixth in all but one measure. Fish with Fish Processing varies between third and fourth. The others are more variable, the Commuters and Retirees has the strongest tendency to a high rank.

Local Consumption Multiplier

Our emphasis to this point has been on the impact of exports on the local economy. We have included the income received by permanent residents fromooutside the region along with other types of inflows. We have also blended into our evaluation the effect of household spending along with the effect of the purchase of business inputs other than those provided by the households. It is more usual to treat households as exogenous, i.e., outside that portion of the flow matrix from Table I, and Table II which is inverted to produce Table III. We elected to keep households endogenous and have only the export and import sectors exogenous. In this way we have a more complete picture of the local economy and a representation that requires less manipulation to arrive at the complete impact estimates which it is felt planners can use.

Ideally, such a study would be set up to provide separate analysis of income accruing to residents from exports, local investment and local consumption. Exports have been covered including associated consumption effects. Local investment, except for construction, has been obscured by our data-collecting techniques. But it is possible to look at the local consumption multiplier process separately and at the same time to show the effect of one statistical correction that was made in order to force the data to the requirements of the model.

This multiplier can be expressed as:[9]

$$Y = y \frac{1}{1 - pc}$$

where:
    Y = Total increase in income
    y = Increase in household receipts
    p = Propensity to consume locally
    c = Income created per dollar of local consumption sales

From Table I note that Residents are shown as importing $5.7 million, but to make the table balance, up to $5.3 million was dropped from the outside income received, or alternatively, we also failed to add up to $5.3 million to Resident Imports or some combination. Taking only the estimate of propensity to consume locally given in Table II, we have p = 0.80 Adjusting for the $5.3 million that was dropped, p = 0.77. This makes such a small difference in further calculations that p = 0.80 is used.

The estimate for c, income created per dollar of local consumption sales, is the sum of the Residents row times the Residents column, which is 0.23.

Solving for Y when y is $1, Y - $1.22.

But note that this estimate of the consumption multiplier stands as an alternative for an estimate to be found in Table III. The direct and indirect effect of the outside income to Residents shown at the intersection of row and column 17 is $1.38. This is probably the less accurate of the two, although the true figure is probably a bit higher than $1.22 Solving for c with p = .8 and y - 1, this value of Y suggests a c of $0.34.

Concluding Comments

Input-output is considerable more costly than the economic base studies now undertaken for small communities. At least one full man-year of time was added to what would have otherwise been done for Southold.

It gives at least the impression of much higher precision in the specification of the local economic structure and considerably more detail than the less time consuming approach. It certainly put some part of the research team "inside" the local economy if the table is prepared based on interviews. If need not be so prepared and it is doubtful if the same insights are then possible; this is not a function of the method, but of the survey. Without a doubt, most of the parts could be more accurately estimated and better analysis done in a specialized study. The advantage is that you know a little about a lot of things.

Errors are probably not highly cumulative, since the parts are largely additive. Even with complete enumeration, the amount of judgement required is great. While the practitioner is still "flying by the seat of his pants" in this, like most empirical analyses, it is a composite of so many little flights that hopefully the final result is fairly close.

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9. Tiebout, op. cit., p. 59, adapted to fit our model and data.

TRANSACTIONS OR FLOW MATRIX

TABLE I

(All Figures in Thousands of Dollars)

Selling Sectors		Retail 01	Auto 02	Whole-sale 03	Boat 04	Motel 05	Pers. Ser. 06	Bus. Ser. 07
Retail	01	46.3	3439.9	16.5	20.8	245.4	63.9	42.0
Automotive	02	59.5	21.0	101.6	9.4	44.2	71.0	139.3
Wholesale	03	157.8	134.8	12.4	295.6	30.7	4.4	14.3
Boating	04	-	-	-	70.0	-	-	49.1
Motel, Etc.	05	-	-	-	-	-	-	-
Personal Ser.	06	11.0	20.8	3.2	2.0	18.3	24.7	26.7
Business Ser.	07	196.0	95.3	119.6	114.7	181.0	65.6	201.1
Manufacturing	08	-	-	10.5	10.0	-	-	-
Fishing	09	-	-	-	7.5	-	-	-
Fish Process.	10	2.2	-	-	-	71.7	-	7.5
Farm	11	52.2	.9	.9	2.6	52.1	-	-
Farm Supply	12	-	-	.5	-	19.2	2.0	.4
Construction	13	10.3	14.4	12.9	48.0	94.2	10.0	54.3
Federal Govt.	14	.8	-	.2	2.0	-	.2	148.4
Local Govt.	15	59.4	18.3	22.6	34.9	138.9	27.3	50.8
Non Profit	16	2.0	1.0	.3	.5	1.3	.7	10.9
Residents	17	1,907.5	1,195.6	716.8	873.0	1,410.0	1,169.2	3,480.2
Seasonal	18	-	221	-	-	-	-	338
Imports (from rest of county)	19_1	1,624	1,803	883	256	717	137	490
(from out of county)	19_2	8,629	2,109	3,762	1,316	905	481	3,281
Total	20	12,758	5,670	5,663	3,063	3,929	2,057	8,334

Purchasing Sectors

TRANSACTIONS OR FLOW MATRIX

TABLE I

(All Figures in Thousands of Dollars)

Purchasing Sectors Selling Sectors		Mfg. 8	Fish 9	Fish Process 10	Farm 11	Farm Supply 12	Const. 13	Fed. 14
Retail	01	6.1	2.9	16.1	170.2	2.5	76.0	13.5
Automotive	02	16.5	16.4	23.0	239.4	17.3	169.7	2.0
Wholesale	03	17.0	143.1	26.0	89.3	.9	787.8	24.9
Boating	04	-	185.2	54.5	-	-	4.1	.3
Motel, Etc.	05	-	-	-	-	-	-	-
Personal Ser.	06	-	-	6.4	5.1	-	2.1	-
Business Ser.	07	24.2	17.4	127.6	424.1	45.1	196.5	-
Manufacturing	08	-	-	1.5	-	-	-	-
Fishing	09	-	50.0	624.5	-	-	-	-
Fish Process.	10	-	29.5	-	-	-	-	-
Farm	11	-	1.0	-	122.2	3,920.0	-	4.3
Farm Supply	12	-	-	-	2,300.0	38.3	9.0	-
Construction	13	19.8	31.5	23.3	103.9	2.5	619.4	68.5
Federal Govt.	14	3.0	-	-	-	-	-	-
Local Govt.	15	6.4	-	54.3	136.4	18.8	34.4	1.2
Non Profit	16	.3	-	.2	-	-	.4	-
Residents	17	877.7	897.0	860.6	1,606.4	568.6	2,485.6	2,240.3
Seasonal	18	-	-	-	-	-	-	-
Imports (from rest of county)	19_1	653	3	226	282	373	1,389	410
(from out of county)	19_2	1,776	223	919	104	1,633	644	1,539
Total	20	3,400	1,600	2,963	5,583	6,620	6,418	4,304

TRANSACTIONS OR FLOW MATRIX

TABLE I

(All Figures in Thousands of Dollars)

Selling Sectors		Local Govt. 15	Non-Profit 16	Res. 17	Seas. 18	Export County 19$_1$	Out 19$_2$	Total 20
Retail	01	153.0	62.9	8,466	2,748	522	49	12,758
Automotive	02	112.0	9.7	2,651	1,323	482	162	5,670
Wholesale	03	58.8	33.2	652	520	2,337	323	5,663
Boating	04	5.8	-	291	2,105	127	171	3,063
Motel, Etc.	05	-	-	1,392	2,382	55	100	3,929
Personal Ser.	06	14.5	18.2	1,188	455	202	59	2,057
Business Ser.	07	175.6	46.2	2,480	517	2,318	989	8,334
Manufacturing	08	-	-	6	18	296	3,058	3,400
Fishing	09	-	-	-	-	79	839	1,600
Fish Process.	10	4.1	-	19	17	210	2,602	2,963
Farm	11	31.8	-	320	141	88	846	5,583
Farm Supply	12	6.0	1.6	32	22	216	3,973	6,620
Construction	13	111.9	93.1	2,254	1,550	1,289	7	6,418
Federal Govt.	14	1.3	6.1	146	33	-	3,963	4,304
Local Govt.	15	-	10.3	2,389	977	193	859	5,032
Non Profit	16	27.0	1.4	627	92	-	1	766
Residents	17	2,594.2	278.3	68	232	3,188	2,000	28,649
Seasonal	18	-	-	-	-	888	14,164	15,611

Imports (from rest of county) 19$_1$		1,048	49	3,953	1,150	12,490	34,165	
(from out of county) 19$_2$		688	156	1,715	1,329	15,446		
						31,209		
Total		5,032	766	28,649	15,611			122,420

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MATRIX OF TECHNICAL COEFFICIENTS

TABLE II

		Retail 1	Auto 2	Whole-Sale 3	Boat 4	Motel 5	Per. Ser. 6	Bus. Ser. 7	Mfg. 8	Fish 9
Retail	1	.0036	.0061	.0029	.0068	.0625	.0311	.0050	.0018	.0018
Automotive	2	.0047	.0037	.0179	.0031	.0112	.0345	.0167	.0049	.0102
Wholesale	3	.0124	.0238	.0022	.0965	.0078	.0021	.0017	.0050	.0894
Boating	4	-	-	-	.0228	-	-	.0059	-	.1158
Motel, Etc.	5	-	-	-	-	-	-	-	-	-
Personal Ser.	6	.0009	.0037	.0006	.0007	.0047	.0120	.0032	-	-
Business Ser.	7	.0154	.0168	.0211	.0374	.0461	.0319	.0241	.0071	.0109
Manufacturing	8	-	-	.0018	.0033	-	-	-	-	-
Fishing	9	-	-	-	.0024	-	-	-	-	.0313
Fish Process.	10	.0002	-	-	-	.0182	-	.0009	-	.0184
Farm	11	.0041	.0002	.0002	.0008	.0133	-	-	-	.0006
Farm Supply	12	-	-	.0001	-	.0049	.0010	.0001	-	-
Construction	13	.0008	.0025	.0023	.0157	.0240	.0049	.0065	.0058	.0197
Federal Govt.	14	.0001	-	-	.0007	-	.0001	.0178	.0009	-
Local Govt.	15	.0046	.0032	.0040	.0114	.0353	.0133	.0061	.0019	-
Non Profit	16	.0001	.0002	.0001	.0002	.0003	.0003	.0013	.0001	-
Residents	17	.1495	.2109	.1266	.2850	.3589	.5684	.4176	.2581	.5606
Seasonal	18	-	.0390	-	-	-	-	.0406	-	-
Imports (from county)	19_1	.1273	.3180	.1559	.0836	.1825	.0666	.0588	.1921	.0019
(from out of county)	19_2	.6763	.3719	.6643	.4296	.2303	.2338	.3937	.5223	.1394
Total	20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

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MATRIX OF TECHNICAL COEFFICIENTS

TABLE II Cont'd

		Fish Proc. 10	Farm 11	Farm Supply 12	Const. 13	Fed. 14	Local Govt. 15	Non Profit 16	Res. 17	Seas. 18
Retail	1	.0054	.0305	.0004	.0119	.0031	.0304	.0821	.2955	.1760
Automotive	2	.0077	.0429	.0026	.0264	.0005	.0222	.0127	.0925	.0847
Wholesale	3	.0088	.0160	.0001	.1227	.0058	.0117	.0433	.0227	.0333
Boating	4	.0184	-	-	.0006	.0001	.0012	-	.0101	.1348
Motel, Etc.	5	-	-	-	-	-	-	-	.0486	.1526
Personal Ser.	6	.0022	.0009	-	.0003	-	.0029	.0238	.0415	.0292
Business Ser.	7	.0431	.0760	.0068	.0306	-	.0349	.0603	.0865	.0331
Manufacturing	8	.0005	-	-	-	-	-	-	.0002	.0012
Fishing	9	.2108	-	-	-	-	-	-	-	-
Fish Process.	10	-	-	-	-	-	.0008	-	.0007	.0011
Farm	11	-	.0219	.5921	-	.0010	.0063	-	.0112	.0090
Farm Supply	12	-	.4120	.0058	.0014	-	.0012	.0021	.0011	.0014
Construction	13	.0079	.0186	.0004	.0965	.0159	.0222	.1215	.0787	.0993
Federal Govt.	14	-	-	-	-	-	.0003	.0080	.0051	.0021
Local Govt.	15	.0183	.0244	.0028	.0054	.0003	-	.0134	.0834	.0626
Non Profit	16	.0001	-	-	.0001	-	.0054	.0018	.0219	.0059
Residents	17	.2904	.2877	.0859	.3873	.5205	.5155	.3633	.0024	.0149
Seasonal	18	-	-	-	-	-	-	-	-	-
Imports (from county)	19_1	.0763	.0505	.0564	.2164	.0952	.2083	.0640	.1380	.0737
(from out of county)	19_2	.3101	.0186	.2467	.1004	.3576	.1367	.2037	.0599	.0851
Total	20	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

MATRIX OF INTERDEPENDENCY COEFFICIENTS

TABLE III

		Retail 1	Auto 2	Whole-Sale 3	Boat 4	Motel 5	Per. Ser. 6	Bus. Ser. 7	Mfg. 8	Fish 9
Retail	1	1.0754	.1178	.0661	.1557	.2573	.2960	.2141	.1167	.2864
Automotive	2	.0299	1.0439	.0401	.0569	.0811	.1262	.0901	.0444	.1106
Wholesale	3	.0235	.0425	1.0125	.1240	.0425	.0434	.0366	.0230	.1504
Boating	4	.0031	.0099	.0029	1.0302	.0093	.0112	.0202	.0047	.1349
Motel, Etc.	5	.0116	.0227	.0183	.0239	1.0311	.0427	.0386	.0185	.0456
Personal Ser.	6	.0112	.0199	.0097	.0220	.0326	1.0502	.0334	.0165	.0407
Business Ser.	7	.0422	.0576	.0447	.0954	.1222	.1288	1.1000	.0486	.1213
Manufacturing	8	.0001	.0002	.0019	.0037	.0003	.0003	.0003	1.0001	.0009
Fishing	9	.0001	.0002	.0001	.0028	.0043	.0004	.0005	.0002	1.0371
Fish Process.	10	.0006	.0008	.0004	.0010	.0195	.0016	.0023	.0007	.0208
Farm	11	.0103	.0078	.0045	.0110	.0353	.0183	.0140	.0075	.0196
Farm Supply	12	.0047	.0039	.0023	.0054	.0207	.0101	.0071	.0038	.0097
Construction	13	.0237	.0404	.0226	.0651	.0890	.0889	.0760	.0425	.1140
Federal Govt.	14	.0020	.0029	.0019	.0049	.0055	.0069	.0231	.0037	.0071
Local Govt.	15	.0258	.0366	.0226	.0556	.0931	.0908	.0679	.0354	.0849
Non Profit	16	.0054	.0080	.0047	.0111	.0146	.0197	.0163	.0085	.0207
Residents	17	.2288	.3327	.2009	.4737	.6155	.8467	.6439	.3690	.9094
Seasonal	18	.0029	.0430	.0034	.0061	.0081	.0101	.0481	.0037	.0092
Total		1.5013	1.7908	1.4596	2.1485	2.4820	2.7923	2.4325	1.7475	3.1233

MATRIX OF INTERDEPENDENCY COEFFICIENTS

TABLE III Cont'd

		Fish Proc. 10	Farm 11	Farm Supply 12	Const. 13	Fed. 14	Local Govt. 15	Non-Profit 16	Res. 17	Seas. 18
Retail	1	.2114	.2807	.2072	.2192	.2302	.2737	.3011	.4275	.3282
Automotive	2	.0822	.1452	.1028	.1027	.0784	.1071	.0936	.1455	.1432
Wholesale	3	.0656	.0636	.0441	.1678	.0415	.0523	.0942	.0630	.0894
Boating	4	.0537	.0112	.0084	.0096	.0093	.0115	.0097	.0172	.1450
Motel, Etc.	5	.0331	.0388	.0295	.0333	.0364	.0391	.0350	.0687	.1749
Personal Ser.	6	.0317	.0358	.0270	.0300	.0324	.0379	.0553	.0611	.0507
Business Ser.	7	.1234	.1989	.1397	.1118	.0816	.1251	.1472	.1520	.1099
Manufacturing	8	.0010	.0003	.0002	.0005	.0003	.0003	.0004	.0005	.0019
Fishing	9	.2189	.0004	.0003	.0003	.0003	.0005	.0003	.0006	.0014
Fish Process.	10	1.0053	.0015	.0012	.0013	.0013	.0023	.0014	.0025	.0048
Farm	11	.0138	1.3808	.8250	.0148	.0162	.0256	.0166	.0278	.0278
Farm Supply	12	.0069	.5736	1.3487	.0089	.0080	.0132	.0104	.0139	.0147
Construction	13	.0793	.1048	.0753	1.1721	.0886	.1018	.2038	.1338	.1631
Federal Govt.	14	.0057	.0076	.0056	.0055	1.0054	.0067	.0143	.0101	.0066
Local Govt.	15	.0790	.1053	.0071	.0667	.0665	1.0715	.0784	.1245	.1123
Non Profit	16	.0152	.0176	.0134	.0151	.0166	.0231	1.0177	.0313	.0163
Residents	17	.6551	.7557	.5769	.6582	.7301	.7765	.6896	1.3768	.4278
Seasonal	18	.0082	.0014	.0097	.0085	.0064	.0093	.0096	.0118	1.0100
Total		2.6895	3.7232	2.4921	2.6263	2.4495	2.6775	2.7786	2.6686	2.8280

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DOLLAR IMPACTS OF EXPORT SECTORS
(Thousands of Dollars)
TABLE IV

		Manufacturing 08	Fish & Fish Process 09,10	Farm & Farm Supply 11,12	Federal Govt. 14	Commuters & Retirees 17	Seasonal People 18
Retail	01	391	857	1,130	912	3,848	4,940
Auto	02	149	333	566	311	1,310	2,156
Wholesale	03	77	323	244	165	567	1,346
Boat	04	16	275	46	37	155	2,183
Motel	05	62	135	160	144	618	2,633
Pers.	06	55	127	147	128	550	763
Bus.	07	163	458	771	324	1,368	1,654
Mfg.	08	3,354	4	1	1	4	29
Fish	09	1	1,568	2	1	5	21
Fish Pro.	10	2	2,846	6	5	22	72
Farm	11	25	57	4,746	64	250	418
Farm Supply	12	13	28	6,186	32	125	221
Const.	13	143	328	413	351	1,204	2,455
Fed. Govt.	14	12	22	31	3,984	91	99
Local Govt.	15	119	300	421	264	1,121	1,690
Non Prof.	16	29	62	72	66	282	245
Res.	17	1,238	2,677	3,122	2,893	12,391	6,439
Seas.	18	12	31	42	25	106	15,203
	19						
Total	20	5,861	10,430	18,106	9,707	24,017	42,567
Multiplier		1.747	2.796	3.534	2.449	2.669	2.828
Figures of Exports forming Basis of Table		3,354	3,730	5,123	3,963	9,000	15,052

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RANKING OF EXPORT SECTORS FOR SELECTED IMPACTS

TABLE V

	Gross Bus.	Gross Bus. Multipliers	Multiplier Part. for Sectors 1-7, 13&16	Tot. Direct Payment to Res. Sector	Multiplier Part. for Res. Sector	Multiplier Part. for Local Gov.	Av. Direct Return / Man Equiv.
Manufacturing	6	6	6	5	5.5	6	1.5
Fish and Fish Process.	4.5	2.5	3	4	2.5	2.5	4
Farm and Farm Supply	2	1	4	2.5	4	2.5	5
Federal Government	4.5	5	5	2.5	2.5	5	1.5
Commuters and Retirees	3	4	2	1	1	1.5	3
Seasonal People	1	2.5	1	6	5.5	1.5	---