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The Economic Base Study of the St. Cloud Area Economy with reference to St. Cloud State College (July 1969)

Nolin Masih
St. Cloud State College

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THE ECONOMIC BASE STUDY OF THE
ST. CLOUD AREA ECONOMY
with reference to
ST. CLOUD STATE COLLEGE

by

Nolin Masih

Department of Economics

St. Cloud State College

St. Cloud, Minnesota

July, 1969

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Nolin Masih

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INTRODUCTION

The image of St. Cloud area economy is changing and will continue to change. Many changes may be traced to the industrial evolution that the area has experienced after World War II. Manufacturing in the area has become a sizable economic activity. Movement of the different industries into the area has brought many kinds of changes, some in the form of blessing and some as new problems, both economic and social. Along with the industries have flowed the outside capital, technology, material resources, and labor. New markets and a host of cause and effect relationships have been created. The area has never been the same.

Aside from the location of new industry in the St. Cloud area, there has been the expansion of existing businesses and other economic, social, political, and educational institutions. One such growing institution, especially in the sixties, is the St. Cloud State College. With the location of new industry, growth of commercial and trade activity, and the college, the population of the area has grown and complicated the cause and effect relationships in the area economy and strained the

economic resources of the community.

For the purpose of this study, the St. Cloud area is defined as the St. Cloud Metropolitan Area plus residential developments in the close proximity to the area. This area includes the cities of St. Cloud, Waite Park, and Sauk Rapids, and the townships of St. Cloud, Le Sauk, and Haven and other residential areas. The area is so defined for the following reasons:

(1) Great majority of people living in this area are in one way or another involved in economic activity of one kind or another. In other words, households in this area constitute one form of economic unit of the area.

(2) Since the economic activities-commercial, trade, and manufacturing-are dispersed over this area, the choice of a smaller area will not give a proper perspective of cause and effect relationships, and will even present formidable problems of measurement of economic activity.

(3) Since the people living in these political units have common economic interests, to leave one unit out would be to constrict the economic causes and effect relationship matrix.

(4) Some people living in one political unit are employed or have business establishments in another unit; it is only proper to look at the whole picture of this area rather than just the part of it. And so the study covers all economic activity, manufacturing, commercial or otherwise, carried on in the above defined St. Cloud area.

The purposes of the study are three-fold:

- a) To study the overall structure of St. Cloud area economy,
- b) To establish relative importance of the industries within the structure of the St. Cloud area economy.
- c) To measure the impact of St. Cloud State College on the area economy.

No one denies the impact of St. Cloud State College, however, no one says what impact there is on the area economy. The study purports to measure this impact. The impact can be felt on the employment, labor supply, wage rate, sales and income of the area. The impact is sociological, ecological, as well as political.

The impact can be beneficial and adverse. The study emphasizes the beneficial impact on the area economy. The impact of St. Cloud State College operations is measured in terms of its effects on the total economic activity.

The St. Cloud State College is a part of the area economy and not set apart from it. It is a community within a community. The St. Cloud State College community is defined as consisting of all who make up the college-faculty, students, staff, and related personnel. The college over the years has created and established the intricate economic, social, and political relationships within the community and outside the community. The study purports to analyse the internal economic relationships. Therefore, in order to ascertain the economic cause and effect relationships of the college within the community, the whole economic structure and economic milieu of this area must be analysed. The study is comprehensive in that, it not only analyses the direct relationships between the college and the industries but also the interdependence of the industries.

The college operates within the economic structure of the area and makes its contribution within this structure.

CHAPTER II - THE DEVELOPMENT OF CONCEPTS

In order to understand the structure of the St. Cloud area economy, some concept must be developed concerning what a community economic system is and why it exists.

To answer these questions, the analysis of the community economic system is necessarily both technical and detailed. The sum and substance of what is sought in the analytical approach, which will be subsequently developed, is an understanding of the sources and levels of income and in general the economic activity in the community. To gain this understanding, it is easy to start with the income flows in a small community whose economic relations are simple.

Mechanics of Community Income

The simple mechanics of a community income stream¹ can be illustrated by a boom and ghost town of the western frontier.² Suppose now that where a Lumber Town, U.S.A. is to locate, there is a wealth of lumber available. Before Lumber Town, U.S.A., existed, the income stream is, of course, zero. However, with the prospects of exploiting the lumber, economic origins of

Lumber Town emerge.

People move in to exploit the lumber resources. At first the patterns of business activity are simple. Lumber is exported and sold outside the town and the receipts are used to import the tools of production, and necessities of life. In terms of flows, lumber flows out and consumer goods and equipment to harvest the lumber flow in. In dollar units, the dollars are gained through exports of lumber and they are lost through purchases of necessary imports.

In due course the merchants arrive: the grocer, the barber, the saloon keeper, and other such service enterprises. The activity of these merchants affects the size as well as the direction and destination of income flows. Previously the dollars leaked out of Lumber Town to pay for services from merchants located outside; now they go to merchants in Lumber Town. The income stream swells as more dollars change hands. However, the income stream does not swell by the total amount of the purchases made locally. Many of the sales dollars taken in by the local merchants, in turn, flow out to pay for the goods they purchase from outside. Nevertheless, income stream has risen.

At this point, it is useful to indicate a variation of the same theme. Suppose a firm locates in Lumber Town which supplies equipment to the lumber industry. Instead of purchasing equipment outside the town, the lumber firms make purchases locally. The effect on income is the same as before. But, again, the income stream does not rise by the full amount of the local purchases, since the suppliers themselves must spend part of the dollars to import their merchandise.

More generally, the income stream of Lumber Town will remain unchanged until something comes along to disturb it. The ripples caused by the disturbance in the income stream will be felt by all in the community. The disturbance may take a variety of forms. First, locally produced goods and services can be substituted for those previously imported from outside. Secondly, an increase in demand for lumber will result in increased exports and thus resulting in higher income levels. Thirdly, increased demand for lumber exports will encourage the lumber firms to expand, providing greater employment and an increase in income. In other words, no matter what the cause of the disturbances, the economic structure of Lumber

Town economy changes and thus the income stream changes. Not only the size of the income stream changes, but also the pattern of distribution of income.

The example of the hypothetical Lumber Town, U.S.A., has demonstrated a method to (a) understand the mechanics of community income stream; and (b) to develop a framework of analysis.

The analogy given above is not too far-fetched when one looks at the St. Cloud area economy in its historical perspective. This is how, in a broad and general way, the communities grow.

The Economic Base Study

The analysis of the economic structure of the metropolitan area, or any other geographic unit, is termed an economic base study. The economic base concept identifies the key economic activities of the community. It divides the local economy into two segments: (1) Activities of firms and individuals serving markets outside the community, and (2), activities of firms and individuals serving markets within the community. The goods and services which the community sells outside its boundaries are considered exports and thus give rise to basic economic activities. The economy in performing

these activities bring new dollars into the community from outside. Those activities which take place within the local economy are considered non-basic, or secondary. Much of the commercial and some producing activities are of this nature, and are generated by the new dollars moving into the economy.

Economic base concept recognizes that industries and firms within industries may sell their product in both markets, or a restaurant serving the needs of the local people is engaged in non-basic economic activities, however, when it serves the needs of the travellers it is engaged in basic economic activities. The sales of each firm in the area under study are placed in either the basic or non-basic category, or divided between the two. Then the sales of all firms are aggregated into the various market areas. In this fashion, a cause and effect relationship is implied by this division of the markets. The export market is considered to be the "prime mover" of the local economic community.

The sales can be used to apportion employment or payrolls

among market areas. If employment serving the export market rises or falls, employment serving the local market is presumed to move in the same direction. When the factory (export market oriented) closes, retail merchants (local market oriented) feel the impact as laid-off factory workers tend to spend less money. Therefore export employment is considered as "basic" due to its role as a "prime mover" while employment serving the local market is considered adaptive or is titled "non-basic".

No economic unit, however large or small, can exist or even survive without giving something up in order to acquire something in return. And so it is also true of St. Cloud area economic system. Its important characteristic is its dependence upon outside sources for its energizing force. All activities are based upon specialization which creates the elaborate system of production and exchange. St. Cloud area economy is a trading system involving two rather specific types of trades, that among units within the system and that between the system and other systems.

St. Cloud area economic system is not essentially different from an individual trading unit, in that it sells its products and its services to the outside world-exports, and uses the income to buy goods and services from the outside world-imports. However, there is one major distinction; the income received from outside-through exports-is not immediately paid out for imports, but circulates through the community from hand to hand, creating local markets for locally produced goods and services; eventually it must leak out again to pay for the imports. Meanwhile, other exports are being made and a continuous flow of new income is maintained. While the "new" dollars are working their way through several hands, the non-basic economic activity, or secondary income, is being generated. One dollar of "new" money thus produces more than one dollar of total economic activity, or total sales.

The foregoing concept can be explained by means of a hypothetical illustration. Suppose a student attending St. Cloud State College who commutes daily from Minneapolis spends a dollar for food in a St. Cloud restaurant. The proprietor of the restaurant spends .30 cents of this dollar in purchasing

additional food supplies from outside, pays out .50 cents in compensations, and .20 cents to utilities. At the end of this first round, .70 cents of the original dollar have remained in the community. Next, suppose that employees who received .50 cents spend .40 cents for groceries locally and buy some merchandise through a mail order house. The utility company pays out .10 cents of the .20 cents it received from the proprietor to employees as compensation and purchases additional fuel from outside with the other .10 cents. At the end of the second round, .50 cents have remained in the community. Now assume that the grocery store spends all its .40 cents in purchase of food from the outside and the employees of the utility go on vacation and spend their .10 cents outside the community. This ends the sequence with no part of the original dollar remaining in the community.

Once this turnover is added together, it can be seen that a total of \$2.20 ($\$1.00 + .70 + .50 + .00$) in total economic activity is produced by the original dollar. This describes the multiplier process and the multiplier amounts to 2.2. When such a tracing technique is used for all "new"

dollars entering the community income stream, during a certain period of time, a community multiplier can be obtained.

CHAPTER III - THE ANALYSIS OF ST. CLOUD AREA ECONOMY

Next, the study intends to show the way in which total economic activity is produced in St. Cloud area as basic income works its way through the economy. Attention is given to identifying all major sources of basic income. By following these basic income dollars(basic economic activity), it will be possible to determine the dependence of each type of local activity, (non-basic economic activity), upon each item of basic income. The total economic activity then is the result of combining basic and non-basic activities.

Such an analysis requires the use of a rather elaborate analytical scheme. The one used here is technically known as an input-output model. A detailed discussion of the technical aspects of this model is omitted, however, the emphasis is given to its application for understanding the economy of St. Cloud area.

There is no single most appropriate unit of measurement of economic activity. This study uses the "sales" of local firms and individuals-measured in terms of percentage distribution of sales to determine markets.

Input-Output Technique

Basically the economy of St. Cloud area can be aggregated into two groupings, "Demand Sectors" and "Industries".

"Demand Sectors" refers to the kinds of markets served by local industries being divided into two broad groups, export and local, and provides an initial break down. These two distinct sources of demand can be subdivided further into component sectors.

This study utilizes three broad demand sectors, which in turn are subdivided into industry demand sub-sectors, so that the information will be meaningful. The demand sectors are:

1. Commercial and Producing Sector
 - a. Manufacturing Industries
 - b. Contract Construction
 - c. Wholesale and Retail
 - d. General Services
 - e. Medical and Health
 - f. Finance, Insurance and Real Estate
 - g. Transportation, Communication and Utility
2. Local Final Demand Sector
 - a. Households
 - b. Local Government
 - c. St. Cloud State College
 - d. Sales to local investment

3. Outside World Demand Sector

- a. Export-Private
- b. Export-Non-local Government

In applying the input-output technique, the economy is also considered as being made up of several industries—each being related in some manner to another industry. The study aggregates firms into industry groupings by following the classification scheme set out in the Standard Industrial Classification Manual.³

The study uses nineteen industries so classified. All industries thus delineated signify receipts and disbursements. Using this criteria, the "Local Government", the "Household", and "St. Cloud State College" are regarded as industries.

A table is then constructed showing the purchases by each local industry—signifying disbursements, from every other local industry and from outside the local economy—signifying receipts. Since each purchase also represents a sale by another industry, it is possible to view the table as representing sales by one industry to another as well. A special segment of the table indicates sales to persons or industries outside the economy.

TABLE - I

INTERINDUSTRY TRANSACTIONS - Distribution of Sales
 ST. CLOUD AREA ECONOMY -- 1967

Industry from \ Industry to					
	Lumber Products	Stone & Rock Products	Metal Fabrication	Tools & Machines	Optics
1. Lumber Products	2,778	1,544	122,246	-	4,218
2. Stone & Rock Products	9,520	89,239	-	-	-
3. Metal Fabrication	-	-	-	-	-
4. Tools & Machines	-	-	-	-	-
5. Optics	-	19,920	-	23,480	4,455
6. Food & Kindred Products	2,280	1,140	1,140	2,280	-
7. Paper Products	1,176	1,176	298	-	60,588
8. Printing & Publishing	8,495	17,035	1,865	2,112	126,125
9. Rubber & Plastics	1,638	637	1,275	1,275	-
10. Misc. Manufactures	-	-	6,185	1,227	1,384
11. Contract Construction	11,455	33,977	4,521	5,830	106,050
12. Wholesale & Retail	88,377	45,007	40,420	21,432	13,198
13. General Services	10,025	9,227	1,123	5,595	8,395
14. Medical & Health	-	-	-	-	-
15. Finance, Insurance & Real Estate	117,088	154,888	36,492	93,724	209,142
16. Transportation, Com- munication & Utility	112,295	203,599	460,090	15,325	121,161
17. Households	882,336	4,062,240	2,856,288	3,462,100	4,482,192
18. Local Government	4,502	18,905	11,273	10,908	825,003
19. St. Cloud State College	-	-	-	-	-
20. Imports	1,185,743	1,861,480	1,581,106	1,371,341	6,167,765
21. Non-Local Government	131,749	206,831	175,678	148,371	685,418
22. Total Inputs	2,569,457	6,726,845	5,300,000	5,165,000	12,815,094

Source: Survey by Author, 1968.

Table - I (Cont.)

	Food & Kindred Products	Paper Products	Printing & Publishing	Rubber & Plastics	Misc. Manufactures	Contract Construction	Wholesale & Retail
1.	2,880	4,167	5,797	-	102,240	208,122	153,270
2.	-	-	-	-	-	509,800	10,868
3.	-	-	-	-	-	814,000	-
4.	-	-	-	-	-	-	-
5.	-	-	6,640	-	20,415	-	178,874
6.	61,560	2,280	1,140	-	5,700	4,560	2,349,503
7.	221,761	-	-	-	600,882	100,980	103,921
8.	4,745	6,680	17,663	1,116	63,155	5,726	386,229
9.	2,550	110,637	2,550	1,913	1,275	52,300	560,700
10.	53	-	419	384	11,384	140	19,267
11.	19,831	3,780	10,652	2,304	15,017	670,636	614,851
12.	125,615	3,882	55,159	25,041	60,178	990,538	2,029,570
13.	13,842	-	11,188	-	80,144	116,691	352,040
14.	-	-	-	-	-	3,575	2,280
15.	266,563	142,368	112,098	48,644	106,092	812,640	1,469,919
16.	220,878	163,261	46,191	37,238	55,321	747,184	911,690
17.	3,744,952	2,444,400	1,788,978	2,411,920	4,104,760	6,212,864	29,250,000
18.	246,167	31,892	11,425	18,938	617,585	83,192	727,666
19.	-	-	-	-	-	-	-
20.	14,051,783	1,331,688	1,112,274	1,137,152	9,787,421	3,149,418	24,102,883
21.	1,562,420	147,965	123,586	126,350	1,027,431	349,935	2,678,098
22.	20,545,600	4,393,000	3,305,760	3,811,000	16,719,000	14,832,301	65,901,629

Table - I (Cont.)

	General Services	Medical & Health	Finance, Insurance & Real Estate	Transportation, Com- munication & Utility	Households	Local Government	St. Cloud State College
1.	10,974	115,435	9,261	21,319	194,587	194,587	-
2.	-	6,400	-	-	126,078	13,820	-
3.	-	-	-	-	66,000	9,750	-
4.	-	-	-	-	-	60,250	-
5.	10,613	76,013	-	-	296,566	-	-
6.	150,110	24,502	-	2,280	1,300,775	184,000	335,600
7.	1,960	5,880	20,980	-	7,128	2,970	-
8.	50,840	30,976	53,410	32,104	178,000	172,444	20,760
9.	12,750	-	-	8,500	183,000	-	-
10.	10,497	-	-	-	29,380	41,170	-
11.	140,894	22,900	1,375,248	66,734	2,586,165	1,068,505	1,906,301
12.	462,880	521,783	272,341	342,359	32,525,080	2,323,319	4,083,459
13.	160,213	103,184	150,661	15,662	1,011,414	45,488	1,474,590
14.	-	5,430	-	-	3,052,235	65,782	194,064
15.	906,897	248,820	531,600	677,568	5,903,937	542,280	43,617
16.	739,090	169,405	100,602	213,819	3,758,674	418,022	340,604
17.	1,215,060	1,120,000	4,863,680	6,407,500	-	1,302,884	6,511,775
18.	98,618	31,264	951,929	183,950	2,451,916	-	-
19.	-	-	-	-	-	-	-
20.	923,921	1,391,958	15,542,014	3,957,313	33,315,800	276,263	-
21.	102,676	154,662	1,726,891	405,641	5,127,594	-	-
22.	4,997,993	4,019,612	25,598,617	12,334,749	92,114,329	6,562,533	14,910,770

Table - I (Cont.)

	Local Investment	Export - Private	Export - Government	Total Output
1.	77,422	1,542,935	35,775	2,569,457
2.	-	5,876,291	84,829	6,726,845
3.	185,250	4,015,000	210,000	5,300,000
4.	1,127,250	3,970,000	7,500	5,165,000
5.	414,300	11,772,818	-	12,815,094
6.	-	15,511,750	605,000	20,545,600
7.	-	3,260,000	3,300	4,393,000
8.	-	1,990,780	135,500	3,305,760
9.	-	2,620,000	250,000	3,811,000
10.	120,810	15,351,650	1,125,050	16,719,000
11.	-	3,005,850	3,160,800	14,832,301
12.	-	18,122,646	1,155,800	65,901,629
13.	-	1,356,356	72,155	4,997,993
14.	-	367,436	328,810	4,019,612
15.	-	12,806,140	369,100	25,598,612
16.	-	3,218,000	282,300	12,334,749
17.	-	2,630,000	2,360,400	92,114,329
18.	-	-	237,400	6,562,533
19.	-	14,910,770	-	14,910,770
20.	-	-	-	122,238,422
21.	-	-	-	14,941,296
22.	4,518,577	122,238,422	10,422,719	459,803,007

It is these sales to persons located outside the economy which denote basic income as described previously. On the other hand, the purchases from industries located outside the economy represents leakages or the parting of the dollar brought into the economy in the form of basic income. Such a table representing inter-industry flow of dollars in St. Cloud area economy in 1967 is shown as Table I.

This table summarizes, in thousands of dollars, all transactions involving sale and purchase of goods and services in the St. Cloud area during the year 1967. The economic activity in the economy is divided into industries, with two additional classifications added, Imports and Non-local Government. Thus making up twenty-one rows indicating the total input (or sales) for each one of the different classifications. There are 22 columns and an additional column for "Total Output".

The two columns in the table listed at the right labeled "Export-Private" and "Export-Government (Federal & State)" represents the value of goods and services sold outside the local economy; i. e. basic income. The two last rows in the lower part of the table titled "Imports" and "Non-Local Government"

represents money leaving the economy to either pay State and Federal government taxes or to import goods and services from persons or businesses located outside the local economy. The remaining large section of the table represents economic activities taking place within the economy between one industry and another.

Since a complete understanding of this table is vital for much of the analysis which follows, considerable attention will be given to examining its details.

Distribution of Industry Input-Output

When Table I is read from left to right, the reader is able to see how each industry distributes its goods and services. The industries listed in the rows (reading left to right) made sales to industries listed in the columns. Since each entry is a sale from the viewpoint of industry listed at the left, it is also a purchase from the viewpoint of the industry listed at the top of the column. Therefore, each column records all the purchases of industry listed at the left. From the accounting point of view, each industry's row shows receipts while each industry's column shows disbursements or expenditures.

TABLE-II

DIRECT PURCHASES PER DOLLAR OF TOTAL ACTIVITY
(INPUT COEFFICIENTS)

ST. CLOUD AREA ECONOMY -- 1967

	Lumber Products	Stone & Rock Products	Metal Fabrication	Tools & Machines	Optics	Food & Kindred Products	Paper Products	Printing & Publishing	Rubber & Plastics	Misc. Manufactures	Contract Construction	Wholesale & Retail	General Services	Medical & Health	Finance, Insurance & Real Estate	Transportation, Communication & Utility	Households	Local Government	St. Cloud State College	Local Investment	Export - Private	Export - Government	Total Output
Lumber Products	.0011	.0002	.0231	----	.0003	.0001	.0009	.0018	----	.0061	.0140	.0023	.0022	.0287	.0004	.0017	.0021	.0068	----	.0171	.0419	.0034	.0056
Stone & Rock Products	.0037	.0133	----	----	----	----	----	----	----	----	.0344	.0002	----	.0016	----	----	.0014	.0021	----	----	.0481	.0081	.0146
Metal Fabrication	----	----	----	----	----	----	----	----	----	----	.0549	----	----	----	----	----	.0007	.0015	----	.0410	.0328	.0201	.0115
Tools & Machines	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	.0092	----	.2495	.0325	.0007	.0112
Optics	----	.0030	----	.0045	.0003	----	----	.0020	----	.0012	----	.0027	.0021	.0167	----	----	.0032	----	----	.0917	.0963	----	.0279
Food & Kindred Products	.0009	.0002	.0002	.0004	----	.0030	.0005	.0003	----	.0003	.0003	.0357	.0300	.0061	----	.0002	.0141	.0280	.0225	----	.1269	.0580	.0447
Paper Products	.0005	.0002	.0001	----	.0047	.0108	----	----	----	.0359	.0068	.0016	.0004	.0015	.0008	----	.0001	.0005	----	----	.0267	.0003	.0096
Printing & Publishing	.0033	.0025	.0004	.0004	.0098	.0002	.0015	.0053	.0003	.0038	.0004	.0059	.0102	.0077	.0021	.0026	.0019	.0263	.0014	----	.0163	.0130	.0072
Rubber & Plastics	.0006	.0001	.0002	.0002	----	.0001	.0252	.0008	.0005	.0001	.0035	.0085	.0026	----	----	.0007	.0020	----	----	----	.0214	.0240	.0083
Misc. Manufacture	----	----	.0012	.0002	.0001	----	----	.0001	.0001	.0007	----	.0003	.0021	----	----	----	.0003	.0063	----	.0267	.1256	.1079	.0364
Contract Construction	.0045	.0051	.0009	.0011	.0083	.0010	.0009	.0032	.0006	.0009	.0452	.0093	.0282	.0057	.0537	.0054	.0281	.1928	.1278	----	.0246	.3033	.0323
Wholesale & Retail	.0344	.0067	.0076	.0041	.0010	.0061	.0009	.0167	.0066	.0036	.0668	.0308	.0926	.1298	.0106	.0278	.3531	.3540	.2739	.5740	.0483	.1109	.1433
General Services	.0039	.0014	.0002	.0011	.0007	.0007	----	.0034	----	.0048	.0079	.0053	.0321	.0257	.0059	.0013	.0110	.0069	.0989	----	.0111	.0069	.0109
Medical & Health	----	----	----	----	----	----	----	----	----	----	.0002	----	----	.0014	----	----	.0331	.0100	.0130	----	.0030	.0315	.0087
Finance, Insurance & Real Estate	.0456	.0230	.0069	.0181	.0163	.0130	.0324	.0339	.0128	.0063	.0548	.0223	.1815	.0619	.0208	.0549	.0641	.0826	.0029	----	.1048	.0353	.0557
Transportation, Communication & Utility	.0437	.0303	.0868	.0030	.0095	.0108	.0372	.0140	.0098	.0033	.0504	.0138	.1479	.0421	.0039	.0173	.0408	.0637	.0228	----	.0263	.0271	.0268
Households	.3134	.6039	.5389	.6703	.3498	.1823	.5564	.5412	.6329	.2455	.4189	.4438	.2431	.2786	.1900	.5195	----	.1985	.4367	----	.0215	.2265	.2003
Local Government	.0018	.0028	.0021	.0021	.0644	.0120	.0073	.0035	.0050	.0369	.0056	.0110	.0197	.0078	.0372	.0149	.0266	----	----	----	----	.0228	.0143
St. Cloud State College	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	.1220	----	.0324
Imports	.4615	.2767	.2983	.2655	.4813	.6839	.3031	.3365	.2984	.5854	.2123	.3657	.1849	.3463	.6071	.3208	.3617	.0407	----	----	----	----	.2658
Non-Local Government	.0513	.0307	.0331	.0287	.0535	.0760	.0337	.0374	.0332	.0650	.0236	.0406	.0205	.0385	.0675	.0329	.0557	----	----	----	----	----	.0325
Total Inputs	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Source: Survey by author, 1968.

Columns are totaled at the bottom indicating total input of the industries and rows are totaled at the far right indicating total output of the industries, and since no industry's output is greater than its inputs, the total of all inputs are equal to the total of all outputs.

If the figures in each column are divided by the total of the column, the result represents purchases by a decimal equivalent (percentage) technically, called an input coefficient. These decimal amounts would then show the distribution of a particular industry's purchases from all other industries as a fractional amount of total purchases. The total of each column is then 1.000. This division process is used to produce Table II, titled "Direct Purchases per Dollar of Total Activity".

Using the Table II, it may be seen that for each dollar of output by a firm in Lumber Products industry for example, less than one cent of one dollar is used to purchase other products locally from other firms in Lumber Products industry, about three cents worth is purchased from Wholesale & Retail industry, four cents are paid to Transportation, Communications, & Utility, industry; thirty-four cents are paid out in terms of payroll or goes as profits, and forty-six cents are paid out for imports.

Considering the column titled, St. Cloud State College, about two cents worth of purchases on every dollar of college expenditures, are made from food and Kindred Products industry. About thirteen cents are paid out for Contract Construction; twenty-seven cents are paid out to Wholesale and Retail industry, nine cents to General Services industry; forty-four cents are paid out in terms of payroll to college-employed personnel. Since there is no direct payment by the college to the local government, the column is left blank. However, later an indirect flow of revenue to the local government from the college operation shall be considered.

Using Tables I and II, some observations of interest regarding various industries follow:

Manufacturing: Manufacturing in St. Cloud is rather diversified and therefore it has been delineated into ten separate industries. In 1967, there were 133 different firms involved in manufacturing activities. Manufacturing firms produced total output of \$81,350,756, which accounted for 18 per cent of the total output of the area economy. Total income accruing to the households in the area amounted to \$30,240,166.

Of the total output 23 per cent was sold locally, and 77 per cent was sold outside the area.

Each industry classified as manufacturing is made up of several firms. Next it will be the task to look at each of the several industries.

1. Lumber Products:

The total output of the industry was \$2,569,457. This is 3 per cent of the total manufacturing output, but less than one per cent of the total output of the area economy. Of the total output of this industry, 56.5 per cent was exported, 3 per cent was sold for investment purposes to local businesses and over one per cent went to state and Federal governments. The rest was sold to other industries within the manufacturing sector. A greater proportion of the outside market for this industry is located in the adjoining area of St. Cloud.

Gone are the days when lumbering in St. Cloud was prevalent, now the firms are engaged in producing lumber products.

2. Stone and Rock Products:

St. Cloud is known for its granite and so the city is referred to as the granite city. Stone industry in this area

is quite old and established. All the stone is quarried around this area, processed in the city, and shipped out of the St. Cloud area.

In 1967, firms in this industry produced \$6,726,845 total output. This is 8 per cent of the total manufacturing output and a little over one per cent of the total output of the area economy. Of the total output, \$5,876,291 was exported. Sixty per cent of its disbursements went to the Households in the area.

3. Metal Fabrication

Total output of the industry was \$5,300,000, which is 6.5 per cent of total manufacturing. The industry contributed about one per cent to the total output of the area economy. The industry exported 75.7 per cent of its total output, however, sold only 19.1 per cent to the local sector. About fifty-four per cent of its total disbursements were made to the Households.

4. Tools and Machines:

Even though the industry is not highly developed, it produced \$5,165,000 worth of total output, which is 6.4 per cent of total manufacturing output. This is comparable to the output

of metal fabricating industry. A large proportion of the output, 76.8 per cent, was exported. Twenty-two per cent of its output was sold to local sector, mostly in the form of business investment. The industry contributed a little over one per cent to the total output. Sixty-seven per cent of its total disbursements accrued to the Households.

5. Optics:

Optics is the second largest manufacturing industry in the St. Cloud area, when output and sales of this industry are compared with the output and sales of other industries. Even though this industry is a relatively new comer to the area, it is quite well established.

Total output of the industry amounted to \$12,815,094, which is 15.8 per cent of the total output of the manufacturing industries. Almost all of the industry output, 91.8 per cent, was exported.

And only 8.2 per cent was sold in the local market. The optics industry contributed \$4,482,192 to the income of the Households, and about 3 per cent was contributed to the total output of the economy.

6. Food and Kindred Products:

This is the largest industry in St. Cloud area, with a total output of \$20,545,600, which is 25.3 per cent of the total manufacturing output, and about 5 per cent of the total output of the area economy. The industry includes the processing of meat products, bottling of soft drinks, bakeries, and dairies. Industry sells in local, regional, and national markets. Greater proportion of the produce, 75.4 per cent, was exported, largely in the regional market, and 24.6 per cent was sold in the local market. Even though it is the largest industry in manufacturing, it contributed only \$3,744,952 to the Household income, which is 4.2 per cent of the total household income.

\$2,349,503 worth of output was sold locally to retailers and wholesalers and \$1,300,775 was sold directly to the households.

7. Paper Products:

The industry's total output amounted to \$4,393,000, which is one per cent of the total output of the economy. It contributed \$2,444,400 to the total household income. 74.2 per cent

of its total output was exported and 25.8 per cent was sold in the local markets. The biggest buyers locally from paper products industry were Contract Construction, Wholesale and Retail, Food and Kindred Products, and Optics industries.

8. Printing and Publishing:

This industry did a gross business of \$3,305,760, which was 4 per cent of the total manufacturing output. The industry includes not only the contract printers but the outdoor advertising firms. The industry did 64.3 per cent of its total business outside the area, and 35.7 per cent locally. It contributed \$1,788,978 to the total income of the households.

9. Rubber and Plastics:

Included in this industry are firms recapping tires and firms making plastic products. Even though this is a relatively small industry, it did a gross business of \$3,811,000. This output is 4.9 per cent of the total manufacturing output and less than one per cent of the total output of the economy. \$2,620,000 worth of output was exported and only \$941,000 worth

of output was sold in the local markets. Locally, the largest buyer of the industry's output were the wholesale and retail stores. The industry contributed \$2,411,920 to the total household income.

10. Miscellaneous Manufacturing:

This is the catch-all category for manufacturing sector. All those firms which could not be properly classified according to the Standard Industrial Classification Code into the above mentioned groups of industries or those firms which were too small or did a small gross business were included in this category. However, when the sales of these firms were lumped together they presented a sizable amount compared to other manufacturing industries. The firms in this category did a \$16,719,000 gross business, which is 20.6 per cent of the total manufacturing. However, almost all of it was exported. Exports of this category amounted to \$15,351,650. Despite a large output of this industry, only \$4,104,760 were contributed to the total household income of the area.

11. Contract Construction:

Although contract construction is usually included in the

manufacturing sector, here it is treated as a separate industry because of its size and importance in the area economy. All firms in the area which are engaged in contract work are included. Building construction firms, electric, plumbing, carpentry, painting, roofing firms are properly classified under this heading.

Total services sold by this industry amounted to \$14, 832, 301, which is over three per cent of the total output of the area economy. It exported \$3, 005, 850 and locally sold \$8, 665, 651 worth of its services. The largest buyers locally were the Households, Local Government, the College and the Finance, Communication, and Real Estate sectors. In recent years, the industry has been booming because of the expansion of the College, construction of new homes and apartment houses.

12. Wholesale and Retail:

This is one of the largest sectors in area economy, as can be expected. Retailers had been classified into eight major groups according to the Standard Industrial Classification Code. In this sector are included all wholesale and retail

businesses such as department stores, clothing stores, liquor, eating and drinking, recreational businesses, general merchandise stores, drug stores, hardware and paint, automotive, and others. It must be kept in mind that quite a few stores which sell their products also provide services. In these cases it was found extremely difficult to separate the physical retailing activity from provision of services by the store. Therefore the service sector on this account may be underestimated.

This industry category did a gross business of \$65,901,629; which is fourteen per cent of the total output of the area economy. The largest proportion of its sales—\$32,525,080—went to the Household sector. College purchased \$4,083,459 worth of merchandise, and local government was next with purchases amounting to \$2,323,319. Wholesale and Retail activity contributed \$29,250,000 to the total income of the households.

Some seasonality can be expected in retail business, because during summer months sales are usually higher. Since

St. Cloud is located at the crossroads of major highways traversing East, West, South, and North, quite a bit of travellers pass through St. Cloud. The sales to transients are of course included in Export-Private sector.

Just as retailers compete in other lines of business besides strictly retailing, other firms sell some commodities at retail even though their major activity lies elsewhere. Major lines of businesses taking part in this activity were the manufacturing firms and building contractors.

13. General Services:

General services have been classified into several major groups according to the Standard Industrial Classification Code; such as Auto Repairs, Barbers and Beauticians, Bowling Alleys, Certified Public Accountants, Hotels and Motels, Laundry, Lawyers, and Motion Pictures. It should be recognized as mentioned before that some service activity is performed by firms other than those classified as general service firms. Retailers, of course, were the major group partaking in these service activities. Likewise, it must be noted that firms classified as being in the general service category made some

commodity sales.

Total sales of general services industry were \$4,997,993 which is a little over one per cent of the total output of the economy. This figure is understated, because some retail firms are engaged in service activities and figures for this portion of the services were not readily available or could not be separated from their sale of merchandise. The industry exported \$367,436 worth of services which is 7.4 per cent of its total sales. The largest sectors purchasing these services were the Household and the College. Industry contributed \$1,215,060 to the total household income.

14. Medical and Health:

In this sector were included the physicians, dentists, and hospital. This sector sold \$4,019,612 worth of its services which is less than one per cent of the total output of the economy. This sector exported \$328,810 worth of services to non-local government agencies and \$194,064 worth of services to local government agencies.

15. Finance, Insurance and Real Estate:

Three separate activities were lumped into this category,

including banks and other credit agencies, insurance firms or offices of insurance companies with home offices elsewhere, and real estate agencies. Individual agents selling insurance or real estate as well as insurance adjustment offices were included in this tabulation.

This sector did a gross business of \$25,598,537, which is about 6 per cent of total output of the economy. Insurance and real estate are the strongest of the three activities. The sector exported \$12,806,140 worth of its services and contributed \$4,863,680 to the household income of the area.

16. Transportation, Communication and Utility:

Three major types of commercial transportation facilities exist in this area: two railroads, a bus line, and trucking firms, and a local bus company. Great Northern maintains extensive freight yards and operates a Railroad Maintenance shop. Greyhound Bus provides services to all points in the U.S. and Canada.

There were about 28 firms involved in trucking business of one kind or another. These firms were engaged in business

of moving, storage, heavy hauling, and motor freight. Some firms served only local markets but a large portion of these firms were engaged in state and nation-wide business - at times their operations extended into international markets.

St. Cloud area is served by Northwestern Bell Telephone Co. with easy access to any point in the U.S. or the world. The office located in St. Cloud covers a rather extensive territory, including St. Cloud, Waite Park, Sartell, Cold Spring, Foley, Holdingsford, Avon, and many other exchanges. The office handles in excess of 27,000 accounts. However, for the metropolitan area of St. Cloud under consideration, there were over about 17,800 telephones listed.

Electricity and Natural gas in the area are supplied by Northern States Power Company. Number of area residences use oil or LP gas for heating purposes even though the natural gas is available. Water and refuse collection were handled by respective local units of the respective local governments.

The sector sold \$12,334,749 worth of services. It is about 3 per cent of total output of the area economy. \$3,218,000 worth of services were exported. The "Households"

was the largest sector to purchase these services—\$3,758,674 worth of services, which is 44.1 per cent of the total services sold locally.

17. Households:

For the analysis of community economic system, the households are regarded as an industry and is required to handle all receipts by residents of the community. The residents are thought of as selling their labor skills, managerial skills and other services for wages, salaries, profits, royalties, etc. The residents sell their services to other sectors in the economy. Compensations in turn, received are the incomes accruing to the household.

Total income accruing to the households in the area economy was \$92,114,329. The population of the area was approximately 54,500, and the number of households, 12,111. The average income accruing to the households then, in 1967, was \$7,399. Households is the largest industry in the economy, selling its services to all sectors. The total output of the households were over 20 per cent of the total output of the area economy. The wholesale and the retail sector received the

largest proportion of the household services, next were the College sector, Transport, Communication, and Utility, and Contract Construction, in that order.

18. Local Government:

This is a separate industry in just about every analysis, owing to its peculiar purchasing pattern, which emphasizes money movement to the "Households" sector and other sectors. Basic assumption is that the local government provides a dollar's worth of services for a dollar tax revenue. "Sales" by local government consist of all revenue, regardless of source, that is taxes, fees, licenses, fines, interest and transfer payments from non-local government.

Total receipts of local governments approximated \$6,562,533 including receipts from State and Federal governments; in other words, the local governments sold an equal amount of services to all sectors of the economy. Services provided by local government amounted to a little over one per cent of the total output of the economy. Of course, the "Households" sector purchased the largest block of these services, as can be expected.

Likewise, the State and Federal governments received

\$14,941,296 in revenue and we can safely assume that the economy in turn received an equivalent amount of services. The largest share of total revenue, more than one-half of this, came from income and profits taxes. Of course most of this came directly from the "Households" sector of the economy.

19. St. Cloud State College:

St. Cloud State College, in just about every phase of economic activity, is treated as a separate industry. This industry is rather unique in that it makes negligible sales of its services directly to St. Cloud area economic sectors, but all services it produces are exported. St. Cloud State College performs and exports a vital service to the State of Minnesota and the nation, namely the education. However, the College as a sector of the area economy purchased over \$14,910,770 worth of goods and services from local industries.

The College is a permanent unit of the area economy and thus it acts and behaves like any other economic unit, at the same time being an educational institution it enjoys all the amenities of other social and religious institutions. The College can be regarded as a community within a larger community. Some

of its members are permanent members of the larger community by virtue of their permanent sojourn and some of its members are temporary members because of their temporary sojourn in the larger community.

Specifically, the large proportion of faculty members and the staff and a small per cent of the student body are residents or have taken up residence in St. Cloud area. However, a bulk of student body are temporary residents for anywhere from seven or eight hours every day to four years. Commuting students spend maybe six to eight hours every day on the campus. Students living in dormitories or in off-campus housing spend anywhere from two to four academic years on the St. Cloud State College campus.

All the students, faculty, and staff members making up the college community give expression through their aggregate economic behavior to the college as one of the sectors of the area economy.

As mentioned before, the college makes negligible sales of its services to the sectors of the area economy, however, it presents itself as a sector (or market) to other industries in

the area economy in which to make their sales. The following table shows the college expenditures made in the economy in 1967

ST. CLOUD STATE COLLEGE EXPENDITURES
for Calendar Year 1967

College: Salaries (Faculty, Staff)	\$6,511,775
Purchases (misc. supplies, equipment, local service and Utilities)	618,452
Construction	1,906,301
Students: Expenditures	5,220,742
ARA Slater Services	653,500
	<u>\$14,910,770</u>

Quite reliable figures for the college were available through the College Accounting Office. Figures for the students' expenditures are based on the survey among the students. Students were classified into seven categories as follows:

- a. Married and commuting
- b. Married and residing in St. Cloud (Temporary)
- c. Married and residing in St. Cloud (Permanent)
- d. Single student living on campus
- e. Single students living off campus in St. Cloud
- f. Single students and commuting
- g. Single students and residing in St. Cloud.

Allowing for a bias toward underestimation, the figures can be regarded as trustworthy.

The college can also be looked at as a sector to which other industries make sales. The following table shows the

purchases of the college from other industries in the economy.

ST. CLOUD STATE COLLEGE PURCHASES
for Calendar Year 1967

<u>Industry</u>	<u>Amount</u>
Food and Kindred Products	\$ 335,600
Printing and Publishing	20,760
Contract Construction	1,906,301
Wholesale and Retail	4,083,459
General Services	1,474,590
Medical and Health	194,064
Finance, Insurance and Real Estate	43,617
Transportation, Communication and Utility	340,604
Households	<u>6,511,775</u>
	<u>\$14,910,770</u>

CHAPTER-IV MEASURING THE ECONOMIC IMPACT

The input-output technique of analysis requires further refinement and application of transactions table and input coefficient table. While the data in these tables are of considerable value, a greater understanding of the actual dollar movements within the economy can be had, by making certain assumptions and extending the analysis further.

While several assumptions are necessary to extend the analysis, the major assumption is that the purchases by an industry are directly related to total output of that industry. This means that the input coefficients would hold true regardless of the output of an industry, in other words the inputs of an industry are assumed to be constant.

One may argue that the purchasing pattern of an industry does not change as the output of that industry changes, is never completely true in the real situation. However, the past experience has shown that the purchasing pattern does remain fairly constant and the aggregate purchases are to a large extent related to the total output of the industry.

Referring to Table-II, the above assumption would imply

TABLE-III

DIRECT AND INDIRECT ACTIVITY PER DOLLAR OF EXPORTS

ST. CLOUD AREA ECONOMY -- 1967

	Lumber Products	Stone & Rock Products	Metal Fabrication	Tools and Machines	Optics	Food & Kindred Products	Paper Products	Printing & Publishing	Rubber & Plastics	Misc. Manufactures	Contract Construction	Wholesale & Retail	General Services	Medical & Health	Finance, Insurance & Real Estate	Transportation, Communication & Utility	Households	Local Government	St. Cloud State College
Lumber Products	1.0044	.0051	.0277	.0050	.0042	.0018	.0055	.0062	.0047	.0088	.0208	.0064	.0074	.0327	.0037	.0063	.0071	.0153	.0089
Stone & Rock Products	.0059	1.0167	.0029	.0032	.0028	.0011	.0029	.0029	.0030	.0018	.0396	.0030	.0040	.0043	.0036	.0031	.0045	.0113	.0084
Metal Fabrication	.0024	.0034	1.0029	.0033	.0032	.0012	.0030	.0030	.0031	.0019	.0606	.0031	.0050	.0029	.0048	.0033	.0045	.0142	.0112
Tools & machines	.0002	.0003	.0003	1.0004	.0008	.0002	.0004	.0003	.0004	.0005	.0004	.0004	.0005	.0003	.0005	.0004	.0005	.0096	.0004
Optics	.0029	.0075	.0041	.0091	1.0032	.0015	.0041	.0060	.0044	.0033	.0044	.0063	.0058	.0201	.0091	.0040	.0068	.0053	.0062
Food & Kindred Products	.0196	.0276	.0260	.0291	.0200	1.0126	.0263	.0253	.0274	.0148	.0287	.0589	.0566	.0306	.0133	.0359	.0415	.0668	.0673
Paper Products	.0016	.0017	.0015	.0016	.0059	.0114	1.0014	.0014	.0015	.0367	.0087	.0033	.0027	.0031	.0019	.0015	.0022	.0045	.0036
Printing & Publishing	.0074	.0084	.0061	.0064	.0154	.0025	.0071	1.0107	.0060	.0077	.0068	.0110	.0172	.0135	.0058	.0084	.0084	.0348	.0111
Rubber & Plastics	.0042	.0053	.0051	.0056	.0037	.0021	.0301	.0055	1.0057	.0036	.0093	.0129	.0078	.0049	.0029	.0056	.0078	.0087	.0092
Misc. Manufactures	.0004	.0007	.0018	.0009	.0009	.0003	.0006	.0007	.0008	1.0013	.0008	.0009	.0029	.0006	.0005	.0007	.0010	.0071	.0011
Contract Construction	.0353	.0492	.0417	.0463	.0480	.0178	.0436	.0435	.0438	.0280	1.0929	.0467	.0810	.0433	.0819	.0491	.0634	.2206	.1905
Wholesale & Retail	.2622	.3616	.3418	.3764	.2508	.1260	.3365	.3340	.3612	.1835	.4058	1.3146	.3837	.3812	.1731	.3482	.5417	.7020	.7031
General Services	.0137	.0160	.0139	.0163	.0108	.0056	.0137	.0166	.0144	.0122	.0229	.0173	1.0466	.0378	.0130	.0147	.0218	.0248	.1217
Medical & Health	.0191	.0302	.0283	.0319	.0198	.0099	.0285	.0269	.0303	.0145	.0282	.0238	.0228	1.0217	.0126	.0269	.0466	.0370	.0469
Finance, Insurance & Real Estate	.1031	.1077	.0895	.1045	.0772	.0424	.1127	.1097	.0952	.0515	.1440	.0919	.2709	.1331	1.0638	.1322	.1241	.1866	.1335
Transportation, Communication & Utility	.0796	.0840	.1383	.0581	.0491	.0296	.0877	.0621	.0622	.0333	.1125	.0584	.2027	.0876	.0329	1.0662	.0793	.1318	.1113
Households	.5681	.8995	.8422	.9494	.5711	.2920	.8459	.8019	.9013	.4199	1.8308	.7046	.6701	.5999	.3629	.7958	1.3889	.7997	.6700
Local Government	.0260	.0378	.0352	.0381	.0872	.0238	.0406	.0351	.0389	.0538	.0415	.0396	.0577	.0372	.0528	.0473	.0509	1.0416	.0464
St. Cloud State College	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	1.0000

Source: Survey by author, 1968.

that the local sector (first nineteen columns) as a unit has a definite relationship to the export sector as a unit, and to the total output column as a unit. Since this table shows definable relationships between these three units, it is possible to manipulate them through the use of matrix algebra. In other words, it is possible to determine the effect of a change in exports (basic income) upon the total output and upon the local sector unit. By handling all units instead of individual entries for a particular industry it is possible to determine the overall effects after the dollar has had a chance to work its way through the economy.

The results of the algebraic manipulation are included in Table-III. It shows both the direct and indirect economic activity resulting from one dollar in basic income entering the economy. The numerical values in this table can also be looked at as individual industry multipliers.

Each numerical value in the Table-III indicates the amount of business which will be generated in the industry noted at the row heading on the left, for each dollar's worth of export made by the industry noted at the top of the column.

For example, if one dollar's worth of export is made by

the Food and Kindred Products industry, then the total output or business generated in this industry is this original one dollar plus approximately an additional \$.0126 (total \$1.0126). Likewise moving down the column for Food & Kindred Products industry, this one dollar's worth of export produces about \$.0178 of additional business for the "contract Construction" category and \$.1260 worth of business for Wholesale & Retail category. If the data given in this column, excluding Households, Local Government and St. Cloud State College, is summed, the total amount of business produced from one dollar's worth of exports can be obtained. The original dollar would be included in the aggregate estimate. Now it may be seen that for each dollars worth of export by Food & Kindred Product industry (or basic income finding its way to this industry) approximately \$1.2660 worth of total business is created. New business amounts to \$.2660, while one dollar represents the original basic income. In addition about \$.02 worth of taxes result for the Local Government and about \$.29 worth of income is derived for the Households sector.

When a dollar's worth of basic income enters the economy, the effect of this dollar is felt by many different industries.

Table-III has quantified this effect after the original basic income has moved throughout all the inter-related industries of the economy and finally has leaked out to sources outside the economy. In other words it shows both the direct and indirect effects on each industry after the original basic income has had a chance to work its way throughout the entire economy.

In this manner the impact of the exports of any industry on the area economy can be measured and ascertained.

Impact of St. Cloud State College

One can project the above example forward to the situation of multi-dollar exports by any industry.

St. Cloud State College exported \$14,910,770 worth of services in 1967. After proper multiplication is made, estimated business activity produced in the economy can be determined. The business thus produced represents the ultimate effect of this basic income (College exports of services) on the economy after this new money has worked its way into and through all the segments of the economy. As a result of the college export of services, total of \$21,388,000 worth of business was produced in the economy. Of this total \$14,910,770 represented the

original amount of basic income which flowed into the economy. Therefore an additional business of \$6,477,230 was produced in the economy.

In addition, approximately \$9,990,215 accrued to the household income and indirectly \$691,859 worth of taxes resulted for the local government.

Table-IV shows the amount of business produced for respective industries in the economy, as a result of the operation of St. Cloud State College. From the table it can be ascertained that St. Cloud State College is a major source of income for the St. Cloud area economy.

TABLE - IV

IMPACT OF ST. CLOUD STATE COLLEGE
ON THE ST. CLOUD AREA ECONOMY

<u>Industries</u>	<u>Industry Multipliers</u>	<u>Value of Business produced</u>
Lumber Products	.0089	\$ 132,706
Stone & Rock Products	.0084	125,250
Metal Fabrication	.0112	167,001
Tools & Machines	.0004	5,964
Optics	.0062	92,447
Food & Kindred Products	.0673	1,003,495
Paper Products	.0063	53,679
Printing & Publishing	.0111	165,510
Rubber & Plastics	.0092	137,179
Misc. Manufactures	.0011	16,402
Contract Construction	.1905	2,840,502
Wholesale & Retail	.7031	10,483,672
General Services	.1217	1,814,641
Medical & Health	.0469	699,315
Finance, Insurance & Real Estate	.1335	1,990,588
Transportation, Com- munication & Utility	.1113	<u>1,659,569</u>
Total		\$21,388,000
Households	.6700	\$ 9,990,215
Local Government	.0464	691,859

Total Output Multipliers:

If one wishes to know the total effect on the St. Cloud area economy of a change in final demand for products of a sector, it is only necessary to sum the interdependency coefficients in the column under consideration. In Table V these final demand "multipliers", with their rank, have been developed for the 19 industries in the local sector of the input-output model.

For example, with the Optics industry products one dollar change in final demand (increase or decrease) causes a total change in production in St. Cloud area of \$1.51. This \$1.51 is the "multiplier" for the Optics sector—every one dollar change in final demand for the products of this sector will have a multiplying effect of \$1.51 on the St. Cloud area economy when all direct and indirect relationships are considered.

Those sectors with large multipliers are closely tied to the domestic St. Cloud area economy inputs. A change in final demand for products of these sectors has sizable effects on other sectors. Very small multiplier value (those close to one) indicate a sector has little dependence on St. Cloud area

industry for productive inputs. These multipliers make it possible to estimate the total production effect in the entire St. Cloud area economy of a final demand change in one sector.

The table also indicates the relative importance of industries by ranking the multipliers for the area economy in terms of their impact on the total economic activity. The multipliers are ranked from highest to lowest.

TABLE - V

OUTPUT MULTIPLIER EFFECTS OF A ONE DOLLAR CHANGE
IN FINAL DEMAND FOR PRODUCTS OF
ST. CLOUD AREA INDUSTRIES

<u>Sector</u>	<u>Multiplier</u>	<u>Rank</u>
Lumber Products	1.5620	12
Stone & Rock Products	1.7254	5
Metal Fabrication	1.7319	4
Tools & Machines	1.6981	7
Optics	1.5158	13
Food & Kindred Products	1.2660	16
Paper Products	1.7041	6
Printing & Publishing	1.6548	11
Rubber & Plastics	1.6641	9
Misc. Manufactures	1.4031	15
Contract Construction	1.9860	2
Wholesale & Retail	1.6589	10
General Services	2.1176	1
Medical & Health	1.8177	3
Finance, Insurance & Real Estate	1.4235	14
Transportation, Com- munication & Utility	1.6966	8

Further Application:

An economic base study can be useful in forecasting.

However, it should be noted that this is one possible use of economic base study, and that forecasts can be made without an economic base study.

One of the hazards of forecasting is that the economic activity is continuously changing. A rate of growth factor is automatically included in forecasting; and this is often missing.

Among the many causes of economic change within a local economy, three are rather important. These are (1) changes in production, (2) changes in expenditures and purchasing patterns, and, (3) changes in prices or price relationships. These causes largely affect the local economy because local economy is so intimately related to the outside regional or national economy.

Earlier in the discussion it was noted that every local economy undertakes certain activities which bring "new" money into the economy. These activities were termed "basic" activities and provide the "lifeblood" of the economy. It is these basic

activities which generate the local business activities. It is through these basic activities that the causes of change have their effect.

The emphasis therefore in forecasting is on the exports of the economy. Communities which have been unable to expand their export markets have not grown. Instead of attempting to forecast the over-all activity, it is only necessary to forecast the magnitude and price changes in the basic activity-exports. Over-all activity can then be determined from forecasted basic activity.

Now there should be some method and information available for making the extension from the changes in basic activity to the total activity. Much of the foregoing discussion, of course, dwelt upon the relationships involved here.

In this case the input-output technique is especially useful, because it provides a method for examining and applying the relationships of basic to over-all activity. One problem arises in that this technique assumes that interrelationships between industries-input coefficients do not change. However, it was mentioned above that changes in expenditure

patterns is one major cause of change in total activity.

Such a problem can be overcome in actual application. Moreover, the structure of a local economy does not change quite so drastically over three to five year periods that there would be a considerable change in input-coefficients. Essentially all that is needed in using input-output model for forecasting is to create a new "export" column pertaining to the year for which a forecast is being made. Matrix multiplication then can provide new estimates of the total economic activity.

If one could forecast for example, the total expenditures of St. Cloud State College for 1973, one could easily ascertain the impact St. Cloud State College would have on the economy for that year. Assuming the input-coefficients are constant and multiplying the projected expenditure of the college by each value in the column titled St. Cloud State College, and summing the results would give the total impact of St. Cloud State College on the St. Cloud economy.

One could also apply the same procedure for any industry in the economy to ascertain the impact of that industry on the area economy.

CHAPTER V - SUMMARY

The study has tried to analyze the structure of the St. Cloud area economy, and found it to be quite a mixture of commercial and manufacturing activities. A cursory view of the economy may give an untrained eye the impression that St. Cloud area economy is a service or commercial economy. On the contrary, the area economy has quite a strong manufacturing sector, which, barring any unforeseen calamity, gives an indication that it will continue to survive and expand.

The boundaries of the area are arbitrarily determined, however, it was necessary to confine the area for proper analysis.

The method and technique used is the interindustry analysis, better known as input-output analysis. This is a research approach leading to quantitative estimates of interrelationships in the total economy. It builds a framework for measuring the impact of private and public spending decisions.

Input-output analysis is based on a system of double entry transactions which shows purchases from and sales to each of the other sectors of the economy, during a given period. All transactions involving sale of goods and services within the area

economy are arranged in a square table indicating simultaneously the sales and purchases of each industry. After this transaction table is constructed, coefficients are derived by using simple mathematical transformations. The final product is a model which combines theoretical economics with mathematical and statistical techniques. It gives quantitative insights into operation of the economy and the multiplicative effects of any one industry upon any other can be analyzed. By taking advantage of relatively stable interrelationship between industries, input-output analysis makes it possible to estimate the impact of a change in output or expenditures of any industry of the economy on all other sectors.

A final product of the analysis is a table indicating interdependency coefficients. These coefficients indicate all the direct and indirect relationships between the industries of the economy.

The interdependency coefficients for the St. Cloud area economy are given in Table III. These coefficients are used in ascertaining the impact of St. Cloud State College on the area economy. For that matter, the impact of any industry on the

economy can be estimated through the use of this table, as long as the exports of that industry are known.

However, the value of the exports by a certain industry does not by itself determine the magnitude of economic activity resulting from that export. It is the manner in which this new money moves through the economy that is the major determinant.

For example, if receipts from the exports of a product immediately leave the economy in the form of taxes paid to the state and federal governments and in terms of paying for expenditures and investment made by home office of the industry which is located outside the local economy, very little additional business is actually produced. This is what happens, and we can safely assume, in case of Food and Kindred Products industry, where local purchases and payroll are small compared to the high value of the product produced.

And if the new dollars entering the economy are immediately spent for commodities which must be shipped in from the outside, some additional business is of course produced, but the new dollars rapidly leak from the economy to pay for commodities being shipped, as would be true in case of Wholesale and

Retail industry.

If the new basic money is distributed in the economy for payrolls and service activities, a much greater amount of additional business is created per dollar of new money brought in as would be true in case of several manufacturing industries and the St. Cloud State College.

The college is a unique economic unit of the area economy. While other industries of the economy may curtail their activities during a downswing of the business cycle, and thus set the multiplier force in reverse, the college cannot so readily curtail its operations.

The college will continue to operate and will continue to bring new money into the area economy. The college is a continuous source of income for the people of St. Cloud area and this source of income is rather sizable.

Even though the multiplier for college sector ranks among the lowest of the sector multipliers, its multiplier for the household sector ranks among the highest. This is so because the smaller relative value of the college multiplier indicates that this sector does not depend upon the St. Cloud area industry

for its productive inputs as much as the other sectors.

St. Cloud State College is a part of the St. Cloud area economy and does not exist apart from it. It makes its contribution to the area economy within a fairly well defined structure. When the St. Cloud State College grows, the area economy must grow. When the area economy will grow, the St. Cloud State College will have made its contribution to this growth. The College, along with other industries, will be the cause of it and not the result.

NOTES

1. The "Community Income Stream" includes the sources of income the movements of income, the levels of income, and the employment associated with this income.
2. This example is based upon an analogous example presented by Prof. Charles Tiebout in his The Community Economic Base Study, pp. 27-28
3. Bureau of the Budget, Standard Industrial Classification Manual (Washington, D. C. : U. S. Government Printing Office, 1957)

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