



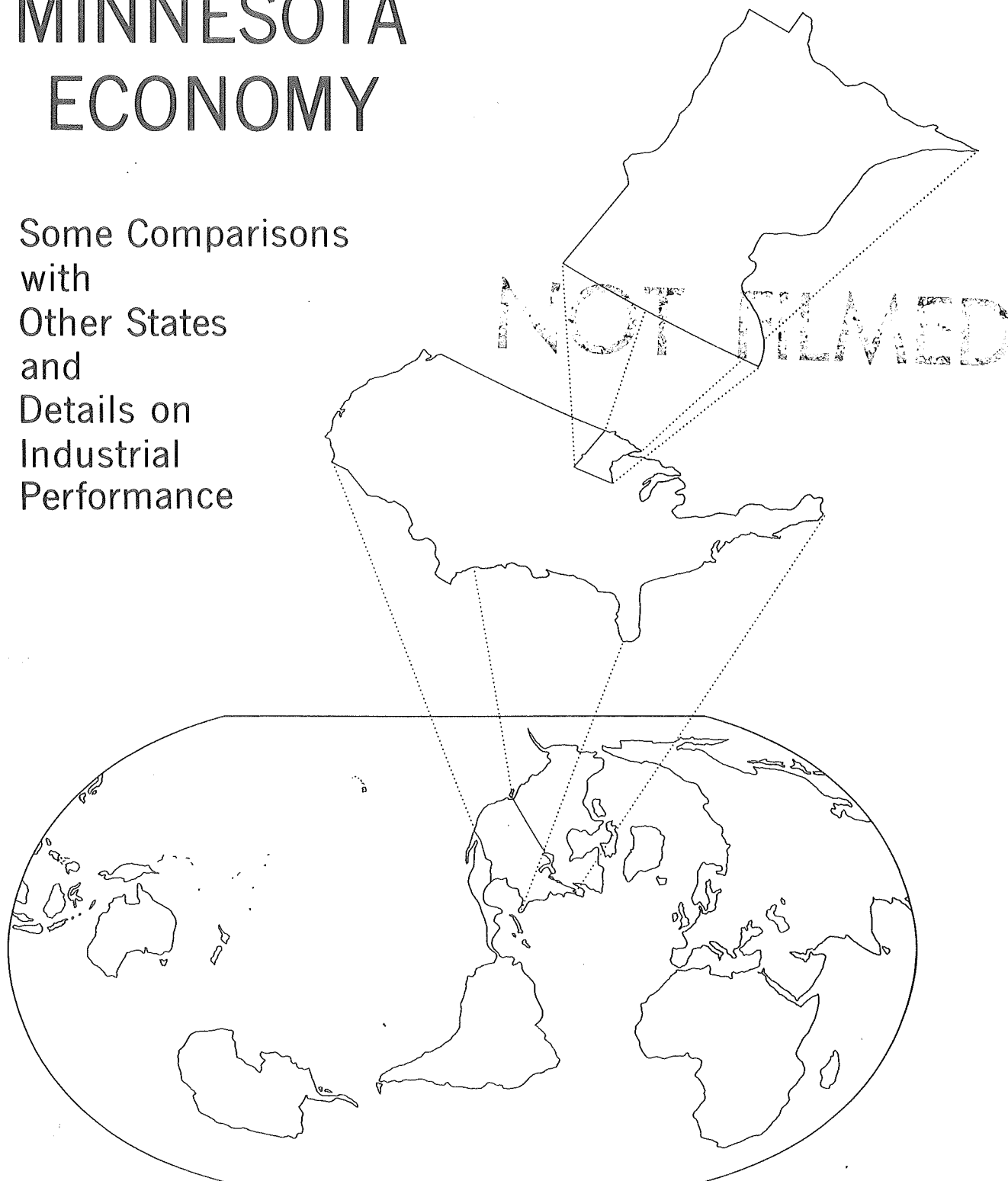
3 0307 00052 5546

820985

1 copy

# THE MINNESOTA ECONOMY

Some Comparisons  
with  
Other States  
and  
Details on  
Industrial  
Performance



HC  
107  
.M6  
A321

port to the people of Minnesota, prepared by staff of the College of Business Administration, the Department of Geography, University of Minnesota – Twin Cities, with financial assistance ided by the Minnesota Business Partnership and the Minnesota AFL-CIO.

September, 1981

*Not updated*

## The Minnesota Economy

Some Comparisons with Other States  
and Details on Industrial Performance

*Monday.  
call  
Margaret Rammer*

John S. Adams - 373-2661  
Bureau of Business Research  
School of Management  
University of Minnesota, Twin Cities

September 1981

The Minnesota Economy: Some Comparisons with Other States  
and Details on Industrial Performance

Executive Summary

This is the second in a series of semi-annual reports on the health and performance of the Minnesota economy. The ongoing series has its origin in a set of questions posed by the Minnesota Business Partnership (MBP), and it is being conducted by staff at the University of Minnesota. The series has three main objectives:

- to provide indicators of Minnesota's economic health;
- to identify components of the state's economy that deserve attention either as opportunities or as problems; and
- to provide a starting point for economic analysis that is acceptable to business, labor, and government.

Financial support for this work has been provided by the MBP, the Minnesota AFL-CIO, and the University of Minnesota. Representatives from the business community, organized labor, state government, and the university have provided advice and comment.

The first report of the series briefly considered Minnesota's recent overall non-agricultural employment picture and then reviewed the performance of those major industries in the state for which appropriate data were available. Minnesota performance figures were held up against those of the nation as a whole and against those of

the Upper Midwest region. This second report is, by comparison, more narrowly focused. Here, attention is first given to further scrutiny of non-agricultural employment and then to detailed looks at just three main industrial sectors: manufacturing, wholesaling, and retail trade. Minnesota figures are compared with those of the other 49 states.

The first observation concerning non-agricultural employment is that this state's has grown faster than that of the nation as a whole in recent years. Between 1977 and 1980 the nation's non-agricultural employment went up 9.1 percent, whereas the state's rose by 11.2 percent. By the calculations herein, it would appear that Minnesota's advantage over the nation as a whole resided primarily in the successes of the state's industries as they competed against their rivals around the country, rather than in the state's specialization in certain industries. This finding applied to the earlier 1972-77 period as well.

Minnesota's performance in manufacturing was generally above average among states. This state ranked 10th among all states and the District of Columbia in terms of growth in real value added between 1972 and 1977. However, Minnesota did less well in terms of 1977 value added per production worker hour and in 1977 value added per employee (the state ranked 18th and 29th respectively, on these measures). In disaggregating Minnesota manufacturing into its individual 2-, 3-, and 4-digit Standard Industrial Classification (SIC) categories, we found that 25 of these industries had increases in real value added of more than 50 percent between 1972 and 1977 and that only 10 industries had declines of that magnitude.

Minnesota ranked 14th among states and the District of Columbia in 1977 wholesale trade volume. This was a reasonable performance, and there would seem to be opportunities for improvement, given the expansion of the market to the south and west of the state. Between 1972 and 1977 Minnesota exceeded the U.S. real growth rate in wholesale trade by 7 percentage points and ranked 16th in percentage growth. However, the state started off the period with a large base figure, and only six states ranked ahead of it in terms of absolute increase in volume. One reason for Minnesota's commendable performance in this sector was its improvement in productivity: during the 1972-77 period only 6 states ranked ahead of Minnesota in terms of percentage change in real sales per wholesale trade establishment, and only 5 ranked ahead of it in terms of percentage change in real sales per employee. If wholesale trade is broken down into its constituent SIC categories, we find that of Minnesota's 78 2-, 3-, and 4-digit wholesale industries, 49 gained, 28 lost, and one stayed the same in real sales during the period 1972-77.

The mid-1970s were generally depressed years for retail trade. Only 26 states, including Minnesota, had increases in real retail sales over the period 1972-77. Under these circumstances, improvements in productivity assumed considerable importance; still, on the measure of real sales per establishment, only Minnesota and 18 other states showed improvement over the period, and there were no improvements in terms of real sales per employee. When the Minnesota retail sector was broken down into SIC categories, we found that between 1972 and 1977 8 retail industries had improvements in real sales of \$25 million or more, which compared to 14 industries that had real losses of \$25 million or more.

The Minnesota Economy: Some Comparisons with Other States  
and Details on Industrial Performance

Table of Contents

Minnesota's Non-Agricultural Employment Performance, 1972-1980 . . . . .	2
Manufacturing . . . . .	7
Change in Real Value Added in Manufacturing, 1972-1977, State by State Comparisons . . . . .	8
Performances of Minnesota's Manufacturing Sectors . . . . .	16
Minnesota's Manufacturing in the Changing World Market. . . . .	29
Wholesale Trade. . . . .	30
Productivity Changes in Minnesota's Whole- saling, 1972-1977 . . . . .	37
Performances of Minnesota's Wholesale Trade Sectors . . . . .	38
Retail Trade . . . . .	44
Minnesota's Retail Trade Performance. . . . .	44
Performances of Minnesota's Retail Trade Sectors . . . . .	51
Retail Trade Changes -- A Mirror of American Societal Changes. . . . .	55
Summary. . . . .	57

THE MINNESOTA ECONOMY: SOME COMPARISONS WITH OTHER STATES  
AND DETAILS ON INDUSTRIAL PERFORMANCE

This report is the second of a series of semi-annual reports that describe the state of the Minnesota economy. The intent of the series is to:

- provide indicators of Minnesota's economic health;
- identify components of the state's economy that deserve attention either as opportunities or as problems; and
- provide a starting point for economic analysis that is acceptable to business, labor, and government.

The first report examined Minnesota's product, employment, and product per employee in the late 1960s and early 1970s by industry, in comparison with U.S. averages and the performances of other states of the Upper Midwest region.\* An advisory committee consisting of representatives from business, organized labor, and state government examined the report and requested (1) analysis of the performance of Minnesota's industries by 3- and 4-digit Standard Industrial Classification (SIC) detail, and (2) additional information about how Minnesota's economy performs compared to the economies of states and regions of the U.S. outside the Upper Midwest. This report responds to these requests. It is organized in five parts:

- an overview of Minnesota's non-agricultural employment performance, 1972-80;
- a survey of Minnesota's manufacturing, with state by state comparisons and detailed industry comparisons, 1972-77;

---

\*John S. Adams, The Minnesota Economy: Where Do Things Stand? What Lies Ahead? Minneapolis: Bureau of Business Research, College of Business Administration, University of Minnesota, December 1980. 69 pp.

- a survey of Minnesota's wholesale trade, with state by state comparisons and detailed sectoral analysis, 1972-77;
- a survey of Minnesota's retailing, with state by state comparisons and detailed sector analysis, 1972-77; and
- summary comments on the analysis of Minnesota's economic performance.

#### Minnesota's Non-Agricultural Employment Performance, 1972-1980

Our previous report noted that between 1977 and March 1980, the non-agricultural sector of the Minnesota economy added a net total of 178,800 jobs, an increase of 11.2 percent. During the same period, national non-agricultural employment expanded at the slower rate of 9.1 percent (Table 1). If Minnesota's non-agricultural employment had expanded during the 1977-80 period at the U.S. rate of 9.1 percent, there would have been a gain of only 145,400 jobs in the state -- or 33,400 fewer jobs than were actually added. In other words, Minnesota's employment growth between 1977 and March 1980 surpassed the national growth rate by 33,400 jobs.

What accounts for these "extra jobs"? Part of the above-average growth came about because Minnesota's base employment in 1977 was relatively concentrated in what turned out to be fast-growth industries (a "mix" effect). The rest of Minnesota's above-average performance came about because firms in the state did better than their counterparts in the same industry across the country (a "local performance" effect).

The mix effect for a Minnesota industry equals the Minnesota base employment in that industry multiplied by the difference between that industry's national employment growth rate and the U.S. overall growth rate of 9.1 percent. For example, Minnesota's mix effect for mining equals:



Table 1. -- U.S. and Minnesota Non-Agricultural Employment, 1972-1980

Industry	(employment in thousands)									
	United States					Minnesota				
					Percent Change					Percent Change
	1972 Avg.	1977 Avg.	1980 March	1972- 1977	1977- 1980	1972 Avg.	1977 Avg.	1980 March	1972- 1977	1977- 1980
Mining	628	813	995	28.8%	22.4%	13.2	12.9	15.6	-2.3%	20.9%
Construction	3,889	3,851	4,303	-1.4	11.7	62.1	68.7	71.8	10.6	4.7
Manufacturing	19,151	19,682	20,711	2.6	5.2	310.8	339.3	383.0	9.2	12.9
Transportation and Utilities	4,541	4,713	5,155	3.4	9.4	86.8	92.4	99.1	6.5	7.3
Wholesale/ Retail Trade	15,949	18,516	20,111	15.9	8.6	332.1	403.5	443.0	21.5	9.8
Finance, Insurance, Real Estate	3,908	4,467	5,072	13.9	13.5	66.7	82.2	94.3	23.7	14.7
Services	12,276	15,303	17,452	24.2	14.0	240.8	312.0	363.3	29.6	16.4
Government	13,334	15,079	16,143	13.1	7.1	246.1	286.3	305.9	16.3	6.8
TOTAL	73,675	82,423	89,942	11.6	9.1	1,358.6	1,597.3	1,776.1	17.6	11.2

Sources: U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings, May 1980, p. 51; U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings, U.S., 1909-78, Bulletin 1312-11, July 1979, and calculations by the author.

Note: Some distortion is introduced by comparing monthly data (March 1980) with annual averages (1972, 1977), but the amount of distortion is probably moderate.

(U.S. mining industry employment growth rate of 22.4%, minus the U.S. employment growth rate of 9.1%) multiplied by (Minnesota's 1977 mining employment of 12,900) = 1,700 jobs.

We can think of the mix effect as having one of two results: either a Minnesota industry's employment is pulled up if that local industry is part of a fast-growth industry nationally, or a Minnesota industry is bogged down when it is part of a slow-growth industry nationally.

The local performance effect for a Minnesota industry compares the Minnesota industry's employment growth rate with the performance of that industry nationally. For example, mining in Minnesota (mainly metal) grew more slowly than mining nationally (mainly coal), so mining's local performance effect was a negative one:

(Minnesota's mining industry employment growth rate of 20.9%,  
minus the U.S. mining industry employment growth rate of 22.4%)  
multiplied by (Minnesota's 1977 mining employment of 12,900)  
= -200 jobs.

As noted earlier, Minnesota added 33,400 jobs over and above what would have been added had state employment increased at the U.S. growth rate of 9.1 percent between 1977 and 1980. During the previous period 1972-77, Minnesota added 81,500 non-agricultural "extra jobs" as employment in the state expanded by 17.6 percent while national employment rose by only 11.6 percent. Between 1972 and 1980, then, Minnesota experienced the addition of 114,900 non-agricultural extra jobs (Table 2). During that same period the state saw its total non-agricultural employment increase by 417,500 jobs, leaving 302,600 that represented the "normal" growth that might have been expected had Minnesota expanded at national rates.

Table 2. -- Minnesota's Extra Jobs, 1972-1980

Industry	Extra (or missing) jobs due to the "mix" effect		Extra (or missing) jobs due to the "local performance" effect		Both effects	
	<u>1972-77</u>	<u>1977-80</u>	<u>1972-77</u>	<u>1977-80</u>	<u>1972-77</u>	<u>1977-80</u>
Mining	2,300	1,700	-4,100	-200	-1,800	1,500
Construction	-8,100	1,800	7,500	-4,800	-600	-3,000
Manufacturing	-28,000	-13,200	20,500	26,100	-7,500	12,900
Transportation and Utilities	-7,100	300	2,700	-1,900	-4,400	-1,600
Wholesale/Retail Trade	14,300	-2,000	18,600	4,800	32,900	2,800
Finance, Insurance, Real Estate	1,500	3,600	6,500	1,000	8,000	4,600
Services	30,300	15,300	13,000	7,500	43,300	22,800
Government	3,700	-5,700	7,900	-900	11,600	-6,600
TOTAL	8,900	1,800	72,600	31,600	81,500	33,400

Sources: U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings, various issues;  
U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings, U.S., 1909-78,  
Bulletin 1312-11, July 1979; and calculations by the author.

During the 1972-77 period the main sources of the extra jobs were services (43,300), trade (32,900), and government (11,600). All three of these sectors were growing much faster nationally than was total U.S. employment, so they provided positive mix effects in Minnesota. In addition, these industries in Minnesota added employment even faster than their national counterparts (i.e., Minnesota service employment grew faster than U.S. service employment, and so forth), so positive local performance effects were added to the positive mix effects to boost substantially the number of extra jobs.

By the 1977-80 period, the profile of extra jobs had changed shape. Growth in government employment had dropped back sharply as it went from a fast growth sector nationally and locally to a slower growth sector. Extra jobs in trade fell sharply to 2,800 for the period. Meanwhile, manufacturing joined services as a leading source of extra jobs over and above average U.S. growth rates.

Overall, in the period 1972-80 about 91 percent of Minnesota's extra jobs (i.e., 104,200 of 114,900) originated in local performance effects as leading sectors outdistanced the expansion rates of their national counterparts (Table 2). Moreover, the proportion of extra jobs traceable to local performance rose from 89 percent in 1972-77 (i.e., 72,600 of 81,500 extra jobs) to 95 percent in 1977-80 (i.e., 31,600 of 33,400 extra jobs).

What this suggests is that the recent growth of the Minnesota economy has not been due mainly to the state's specialization in the fast growth industries of the 1970s. Rather, the extra jobs have come about because of a series of local success stories in which Minnesota firms and organizations outperformed their national rivals. This record is especially notable in manufacturing (1972-77, 1977-80), wholesale and retail trade (1972-77), and

services (1972-77, 1977-80). In the following sections we will examine manufacturing and trade in detail. Services are not completely covered by the economic censuses of 1972 and 1977, and the nature of their coverage changed between the two censuses; for these reasons this important sector will not be examined here.

### Manufacturing

Manufacturing is a major source of national and regional product, consistently providing about 25 percent of the Gross National Product (GNP). Manufacturing is especially important to a regional economy because manufactured items can be exported more easily than most services and raw materials, and the earnings that return to the region can be recycled to support other intermediate goods manufacturers and local service industries, including government.

In 1977 there were 331,700 persons employed in Minnesota's manufacturing establishments, an increase of 10 percent over the 1972 total of 302,200. The value added by manufacturing in the state was \$9.6 billion in 1977, up 74 percent from \$5.5 billion in 1972. Value added equals the value of shipments minus the cost of materials, supplies, containers, fuels, and purchased electrical energy. It is considered the most useful measure of the volume of output from the manufacturing sector.

A substantial part of the 74 percent increase in Minnesota's manufacturing value added between 1972 and 1977 was attributable to price increases. The 1977 Producers Price Index (PPI) for all commodities was 194.2; in 1972 it was 119.1. That is, the PPI rose 63.1 percent in five years. The ratio of the two indices ( $119.1/194.2 = .6133$ ) can be used to deflate 1977 value added

figures to express them approximately in 1972 dollars. Note, however, that if a manufacturer's required inputs rose in price faster than the PPI, then using .6133 to deflate 1977 figures will effectively overstate the deflated estimate of value added insofar as the procedure ignores the increase in funds necessary for continued purchase of the inputs. Such is the case, for example, for industries that purchase large quantities of grain or oil as raw material inputs. The reverse is also true. If an industry's input prices rose more slowly than the PPI, using .6133 to deflate 1977 figures to 1972 price levels will effectively understate the deflated estimate of 1977 value added. But on the average, using the PPI to deflate 1977 value added to 1972 dollars permits a useful comparison between 1972 and 1977 value added for each manufacturing industry in Minnesota, and for Minnesota with respect to the other states.

#### Change in Real Value Added in Manufacturing, 1972-1977, State by State Comparisons

Value added by manufacturing rose in every state between 1972 and 1977, but much of the apparent gain was simply an inflationary increase (Table 3). When the 1977 state totals are converted to 1972 prices using the PPI, Minnesota emerges with an estimated rise in real value added of \$367 million between 1972 and 1977 (Figure 1). Nationwide, sixteen states had declines in real value added in manufacturing during that period; 34 states and the District of Columbia had increases. Nine states had increases in estimated real value added that were larger than Minnesota's: Texas, Louisiana, Mississippi, Oklahoma, Wisconsin, Iowa, Washington, California, and Virginia. Rapid price increases for oil and for grain during the 1972-77 period had the effect of boosting the levels of value added in states that emphasized manufacturing based on these materials.

Table 3. -- Changes in Real Value Added by Manufacturing, 1972-1977,  
and Population Change, 1970-1979, Minnesota and Other States

State	Value Added (millions)			Real Change 1972-1977	Population Change 1970-79 (thousands)
	1972	1977	1977 (in 1972 dollars)*		
ME	\$1,376	\$2,343	\$1,437	\$61	103
NH	1,279	2,175	1,334	55	149
VT	576	1,050	644	68	49
MA	10,678	16,349	10,027	-651	80
RI	1,764	2,737	1,679	-85	-20
CT	6,828	10,934	6,706	-122	83
NY	30,402	44,290	27,163	-3,239	-593
NJ	16,409	22,853	14,016	-2,393	161
PA	23,519	36,017	22,089	-1,430	-70
OH	27,171	43,055	26,406	-765	73
IN	14,112	22,718	13,933	-179	205
IL	25,847	40,279	24,703	-1,144	119
MI	23,376	37,566	23,039	-337	325
WI	9,443	16,606	10,184	741	302
MN	5,524	9,605	5,891	367	254
IA	4,758	8,684	5,326	568	77
MO	8,169	13,042	7,999	-170	190
ND	201	473	290	89	39
SD	285	612	375	90	23
NB	1,733	2,867	1,758	25	89
KS	2,915	5,338	3,274	359	120
DE	1,292	1,596	979	-313	34
MD	4,707	7,116	4,364	-343	225
DC	389	610	374	-15	-101
VA	6,178	10,882	6,674	496	545

Table 3. -- (continued)

State	Value Added (millions)			Real Change 1972-1977	Population Change 1970-79 (thousands)
	1972	1977	1977 (in 1972 dollars)*		
WV	\$2,647	\$3,880	\$2,380	\$-267	133
NC	11,015	18,231	11,181	166	522
SC	4,966	8,186	5,020	54	341
GA	7,370	12,549	7,696	326	529
FL	5,787	9,255	5,676	-111	2,068
KY	5,682	9,546	5,855	173	306
TN	7,662	12,663	7,766	104	454
AL	5,065	8,406	5,155	90	325
MS	2,825	5,619	3,446	621	212
AR	2,800	4,882	2,994	114	257
LA	4,273	9,418	5,776	1,503	373
OK	2,270	4,662	2,859	589	332
TX	15,253	33,150	20,330	5,078	2,182
MT	463	847	519	56	92
ID	821	1,430	877	56	192
WY	144	381	234	90	117
CO	2,504	4,472	2,743	239	563
NM	358	734	450	92	224
AZ	1,880	3,333	2,044	164	675
UT	1,069	1,974	1,211	142	308
NV	208	495	304	96	213
WA	4,721	8,955	5,492	771	513
OR	3,490	6,138	3,764	274	436
CA	31,175	54,862	33,647	2,472	2,723
AK	171	504	309	138	104
HI	410	786	482	72	145

Source: U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1980, pp. 13, 810-11.

\*1977 dollars converted to (estimated) 1972 dollars using factor of .6133, the ratio of 1972 and 1977 PPI's. See text.



## Change in Real Value Added in Manufacturing, by State, 1972-1977

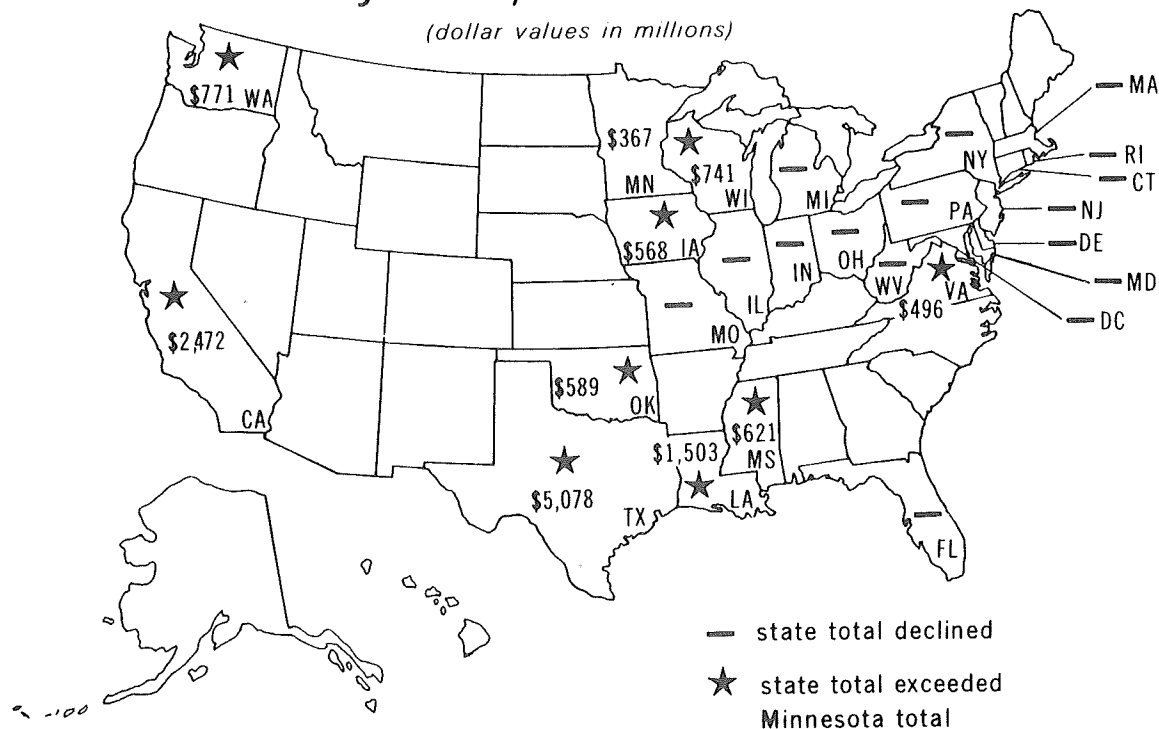


Figure 1

Minnesota's strong performance in manufacturing in the 1970s no doubt has several sources. Some of the popular explanations that have been suggested over the years include the following:

- Minnesota business is innovative. It has been argued that the state's resident business leadership is especially receptive to innovation -- that is, the creation of valuable new work that can be done in Minnesota and done well.
- Minnesota business is efficient. According to this argument, the state's business leadership is constantly seeking to do old, traditional work in new and more efficient ways. In trying to keep its productivity high, Minnesota business uses its employees and production workers more effectively than other states.
- Minnesota is bountiful. It has a population of average size for a state, but it is an areally large and diverse state, with a wide range of valuable natural resources and amenities -- water, sunshine, fertile soil, lakes and forests, and known and undeveloped mineral wealth as well as suspected mineral deposits in unexplored regions.

- Minnesota has a diversified economy. The state has a diversified economy that partially insulates it from the disruptive effects of the extreme peaks and troughs of the national business cycle.

However, Minnesota's value added in manufacturing has not been equally impressive on all measures. In 1977, real value added per employee in the state's manufacturing sector was \$17,760 (in 1972 dollars), down slightly from the 1972 level of \$18,279 (Table 4). We find that in 1977 twenty-eight states exceeded Minnesota in real value added per employee. On the other hand, only 17 states exceeded Minnesota in real value added per production worker hour. In value added per employee, Minnesota did better than most states in New England and the Middle Atlantic, the South and border states, and some Rocky Mountain states (Figure 2). In value added per production worker hour,

### Real Value Added per Employee in Manufacturing, by State, 1977

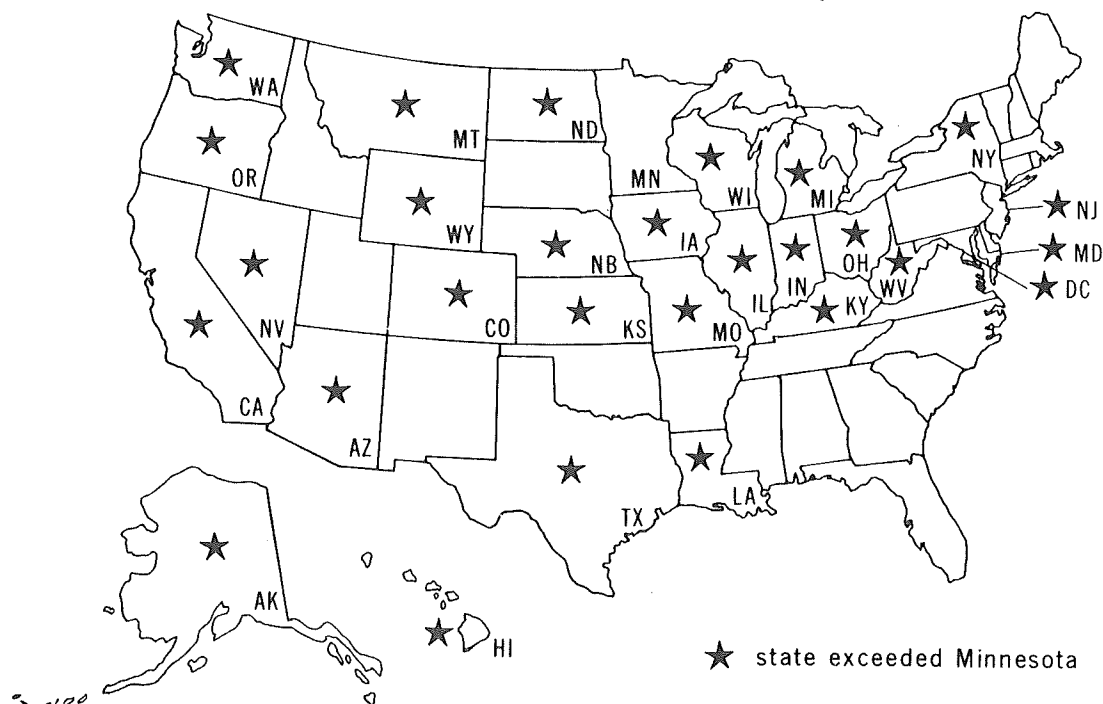


Figure 2

Table 4. -- Manufacturing Value Added per Employee  
and per Production Worker Hour, 1972 and 1977,  
Minnesota and Other States

State	Value Added per:					
	Employee 1972	Employee 1977	Employee 1977 (in 1972 dollars)*	Production Worker Hour		
				1972	1977	1977 (in 1972 dollars)*
ME	\$13,834	\$22,801	\$13,980	\$8.53	\$14.32	\$8.78
NH	14,254	22,815	13,990	9.73	15.76	9.67
VT	15,610	25,277	15,500	11.03	18.79	11.52
MA	17,252	26,654	16,350	13.15	20.65	12.66
RI	14,940	21,885	13,420	10.13	15.42	9.46
CT	17,101	26,531	16,270	13.11	21.48	13.17
NY	18,105	29,334	17,990	14.70	24.24	14.87
NJ	19,626	29,364	18,010	15.32	23.91	14.66
PA	16,592	27,097	16,620	12.04	20.22	12.40
OH	20,182	32,344	19,840	14.39	23.42	14.36
IN	20,048	32,183	19,740	13.55	22.17	13.60
IL	19,791	31,316	19,210	14.52	24.02	14.73
MI	21,721	33,665	20,650	14.77	23.10	14.17
WI	18,868	31,042	19,038	13.11	22.28	13.66
MN	18,279	28,956	17,760	14.43	23.79	14.59
IA	22,077	36,139	22,160	15.29	26.18	16.06
MO	18,210	30,206	18,530	13.99	22.86	14.02
ND	19,676	34,201	20,980	13.94	26.70	16.38
SD	16,351	27,216	16,690	11.33	19.09	11.71
NB	20,417	32,704	20,060	13.58	23.12	14.18
KS	21,280	31,757	19,480	14.40	22.10	13.55
DE	18,696	24,010	14,730	17.48	25.35	15.55
MD	18,415	29,263	17,950	13.62	22.84	14.01
DC	19,655	32,845	20,140	23.11	46.04	28.24
VA	16,456	27,536	16,890	10.60	18.70	11.47

Table 4. -- (continued)

State	Value Added per:					
	Employee 1972	Employee 1977	Employee 1977 (in 1972 dollars)*	Production Worker Hour		
				1972	1977	1977 (in 1972 dollars)*
WV	\$21,910	\$33,171	\$20,340	\$14.56	\$22.71	\$13.93
NC	14,810	23,821	14,610	9.10	15.36	9.42
SC	14,389	21,878	13,420	8.54	13.78	8.45
GA	15,799	25,890	15,880	10.01	16.94	10.39
FL	16,876	25,850	15,850	12.02	19.07	11.70
KY	21,964	34,404	21,100	14.46	23.89	14.65
TN	16,393	25,852	15,860	10.56	17.58	10.78
AL	15,700	24,654	15,120	9.75	16.01	9.82
MS	14,095	25,614	15,710	8.51	16.14	9.90
AR	15,477	24,768	15,190	9.38	15.73	9.65
LA	23,821	48,349	29,650	15.56	32.26	19.79
OK	15,908	28,367	17,400	12.20	21.75	13.34
TX	20,687	37,322	22,890	14.78	27.80	17.05
MT	21,612	35,530	21,790	13.76	23.21	14.23
ID	19,088	27,437	16,830	12.44	18.57	11.39
WY	20,557	44,929	27,554	14.25	31.56	19.36
CO	18,886	29,325	17,990	14.17	23.53	14.43
NM	15,169	25,282	15,510	10.88	18.58	11.40
AZ	20,017	30,062	18,440	15.52	24.68	15.14
UT	18,882	28,108	17,240	14.50	21.39	13.12
NV	20,770	32,920	20,190	15.39	25.68	15.75
WA	20,891	33,787	20,720	15.57	26.48	16.24
OR	19,540	30,323	18,600	12.86	21.05	12.91
CA	20,179	31,323	19,210	15.80	24.67	15.13
AK	22,720	44,134	27,070	14.69	29.91	18.34
HI	16,532	31,377	19,240	12.39	25.06	15.37

Source: U.S. Department of Commerce, Bureau of the Census, 1977 Census of Manufactures, Geographic Area Series, Table 2b.

\*1977 dollars converted to (estimated) 1972 dollars using factor of .6133, the ratio of 1972 and 1977 PPI's. See text.

Minnesota's principal competition comes from established and highly capitalized industrial states (New York, New Jersey, Illinois), states with heavy emphasis on oil and chemicals (Alaska, Delaware, New Jersey, Louisiana, Texas), states with extremely small manufacturing bases (North Dakota, Wyoming, Nevada, Hawaii, Alaska), plus states with recent sizable increments in population and strong involvement in high technology industry (Washington, Texas, California) (Figure 3).

Minnesota's above-average performance in real value added per production worker hour, compared to other states, can be traced to one or more of three causes:

### Real Value Added per Production Worker Hour in Manufacturing, by State, 1977

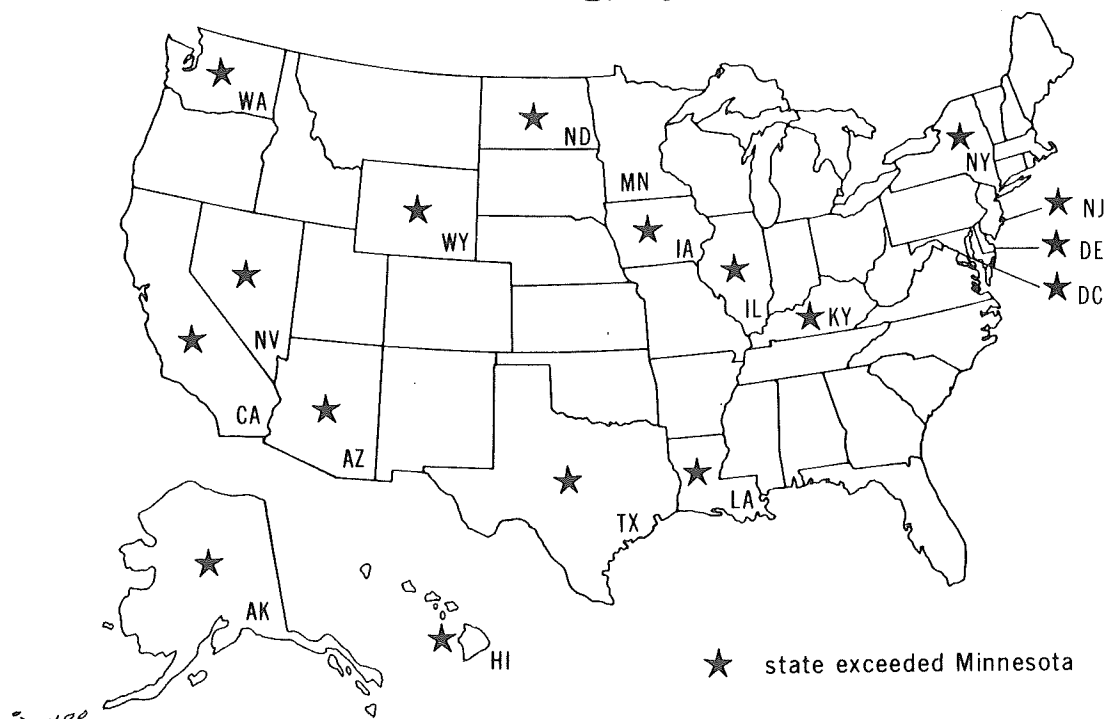


Figure 3

- The state's manufacturers tend to specialize in lines of production that characteristically have high value added per worker.
- Minnesota manufacturing workers are exceptionally productive.
- The deflation factor is too large for Minnesota and overstates the estimates of real 1977 value added. To the extent that Minnesota manufacturers used a disproportionate amount of raw materials in 1977 that had risen in price faster than the PPI (like grain and oil), the deflation factor of  $(119.1/194.2 = .6133)$  is too big and estimates of real 1977 value added are too high.

#### Performances of Minnesota's Manufacturing Sectors

A large majority of SIC 2-, 3-, and 4-digit manufacturing industries in Minnesota had gains or declines in real value added per year between 1972 and 1977 of less than \$10 million (in 1972 dollars) (Table 5, Figure 4). However, there were 16 industries in which estimated 1977 real value added exceeded the 1972 total by more than \$30 million (as extracted from Table 5):

SIC 36	Electric and electronic equipment	\$178.5 million
32	Stone, clay and glass products	164.0
329	Miscellaneous non-metallic mineral products, including abrasives	154.2
35	Machinery, except electrical	122.3
29	Petroleum and coal products	86.0
357	Office and computing machines	85.1
24	Lumber and wood products	61.0
366	Communication equipment	58.9
27	Printing and publishing	58.8
363	Household appliances	51.5
Other 28	Including plastic materials, synthetics, resins, drugs, plastics	47.8
2022	Cheese	43.1
2752	Commercial printing, lithography	42.7
275	Commercial printing	
2038	Frozen (dairy) specialties	34.6
Other 36	Including other 364: electric lighting and wiring equipment; 365: radio and TV receiving equipment; 369: storage batteries, x-ray, electromedical, and electrotherapeutic apparatus, engine electrical equipment, electrical equipment not elsewhere classified	30.8

The gains in real value added per year provided by Minnesota's expanding industries were offset in part by major declines in other industries.

Table 5. -- Value Added by Manufacturing in Minnesota, 1972 and 1977

Industry	Value added by Manufacturing			Real Change 1972-1977	
	(dollars in millions)	1972	1977	1977 (in 1972 dollars)*	Dollars      Percent Change
<u>SIC 20. Food and kindred products</u>		\$923.3	\$1,465.8	\$899.0	\$-24.3      -3%
201. Meat products		247.1	333.3	204.4	-42.7      -17
2011. Meat packing plants		186.1	227.3	139.4	-46.7      -25
2013. Sausage and prepared meats		8.8	28.5	17.5	8.7      99
Other 201, incl. poultry, eggs		52.2	77.5	47.5	-4.7      -9
202. Dairy products		150.5	264.9	162.5	12.0      8
2021. Creamery butter		24.0	18.2	11.2	-12.8      -53
2022. Cheese		34.1	125.8	77.2	43.1      126
2023. Condensed, evaporated milk		16.3	38.2	23.4	7.1      44
2024. Ice cream; frozen desserts		12.4	22.5	13.8	1.4      11
2026. Fluid milk		63.7	60.2	36.9	-26.8      -42
203. Preserved fruits and vegetables		135.5	242.7	148.8	13.3      10
2033. Canned fruits, vegetables		63.0	129.0	79.1	16.1      26
2037. Frozen fruits, vegetables		23.5	8.5	5.2	-18.3      -78
2038. Frozen specialties		27.5	101.3	62.1	34.6      126
Other 203, incl. pickles, sauces		21.5	3.9	2.4	-19.1      -88
204. Grain mill products		98.4	157.8	96.8	-1.6      -2
2041. Flour, other grain mill products		34.6	61.1	37.5	2.9      8
2048. Prepared foods, n.e.c.		38.2	42.5	26.1	-12.1      -32
Other 204, incl. cereal, breakfast food, pet food		25.6	54.2	33.2	7.6      30
205. Bakery products		51.2	72.4	44.4	-6.8      -13
206. Sugar and confectionary products		38.0	72.1	44.2	6.2      16
207. Fats and oils		37.6	103.0	63.2	25.6      68
208. Beverages		127.9	163.2	100.1	-27.8      -22
209. Miscellaneous food and kindred products		36.9	56.5	34.7	-2.2      -6

Table 5. -- (continued)

Industry	(dollars in millions)	Value added by Manufacturing			Real Change 1972-1977	
		1972	1977	1977 (in 1972 dollars)*	Dollars	Percent Change
<u>SIC 22. Textile mill products</u>		\$30.9	\$33.3	\$20.4	\$-10.5	-34%
225. Knitting mills		10.8	14.1	8.6	-2.2	-20
Other 22, incl. weaving, finishing mills; non-woven fabrics		20.1	19.2	11.8	-8.3	-41
<u>SIC 23. Apparel, other textile products</u>		65.6	98.8	60.6	-5.0	-8
232. Men and boy's furnishings		28.5	33.9	20.8	-7.7	-27
2329. Men, boys furnishings n.e.c.		12.6	13.4	8.2	-4.4	-35
Other 232. Shirts, nightwear		15.9	20.5	12.6	-3.3	-21
233. Women's and misses outerwear		8.8	25.4	15.6	6.8	77
2337. Suits and coats		6.2	21.5	13.2	7.0	113
Other 233.		2.6	3.9	2.4	-.2	-8
239. Misc. fabricated textile products		9.0	20.4	12.5	3.5	39
2391. Curtains, draperies		2.4	5.8	3.6	1.2	50
2392. House furnishings, n.e.c.		3.6	7.4	4.5	.9	25
2394. Canvas, related products		1.4	2.8	1.7	.3	21
Other 239.		1.6	4.4	2.7	1.1	69
Other 23. Women's and children's under- garments; hats, caps		19.3	19.1	11.7	-7.6	-39
<u>SIC 24. Lumber and wood products</u>		143.5	333.4	204.5	61.0	43
241. Logging camps, contractors		9.0	23.4	14.4	5.4	60
242. Sawmills, planing mills		12.3	21.1	12.9	0.6	5
2421. Sawmills, planing mills, general		10.7	17.8	10.9	0.2	2
Other 242, incl. hardwood flooring		1.6	3.3	2.0	0.4	25
243. Millwork, plywood, structural members		74.5	168.1	103.1	28.6	38
2431. Millwork		57.1	132.4	81.2	24.1	42
Other 243, incl. kitchen cabinets, structural wood		17.4	35.7	21.9	4.5	26
244. Wood containers, pallets, skids		3.0	5.2	3.2	0.2	7



Table 5. -- (continued)

Industry	(dollars in millions)	Value added by Manufacturing			Real Change 1972-1977	
		1972	1977	1977 (in 1972 dollars)*	Dollars	Percent Change
245. Wood buildings, mobile homes		\$24.7	\$47.4	\$29.1	\$4.4	18%
2451. Mobile homes		16.5	16.0	9.8	-6.7	-41
2452. Prefabricated wood buildings		8.2	31.4	19.3	11.1	135
249. Misc. wood products, and wood preserving		19.9	68.1	41.8	21.9	110
<u>SIC 25. Furniture and fixtures</u>		57.3	90.8	55.7	-1.6	-3
251. Household furniture		19.8	26.0	15.9	-3.9	-20
2511. Wood household furniture		3.2	5.9	3.6	0.4	13
2515. Mattresses, bedsprings		6.2	12.0	7.4	1.2	19
Other 251, incl. metal furniture; radio, T.V. cabinets		10.4	8.1	5.0	-5.4	-52
254. Partitions and fixtures		24.7	35.9	22.0	-2.7	-11
2541. Wood partitions, fixtures		8.0	15.2	9.3	1.3	16
2542. Metal partitions, fixtures		16.7	20.6	12.6	-4.1	-25
Other 25, incl. public building and related furniture; miscellaneous		12.8	28.9	17.7	4.9	38
<u>SIC 26. Paper and allied products</u>		511.1	570.1	349.6	-161.5	-32
265. Paperboard containers and boxes		68.4	103.6	63.5	-4.9	-7
2651. Folding paperboard boxes		19.2	28.9	17.7	-1.5	-8
2653. Corrugated and solid fiber boxes		44.3	64.6	39.6	-4.7	-11
Other 265, incl. setup paperboard boxes		4.9	10.1	6.2	1.3	27
Other 26, incl. paper mills; paperboard mills; converted paper products		442.7	466.5	286.1	-156.6	-35
<u>SIC 27. Printing and publishing</u>		402.2	751.6	461.0	58.8	15
2721. Periodicals		25.6	39.8	24.4	-1.2	-5
273. Books, publishing, printing		53.0	114.8	70.4	17.4	33
275. Commercial printing		155.8	323.3	198.3	42.5	27
2751. Commercial, letterpress		33.6	59.5	36.5	2.9	9
2752. Commercial, lithographic		117.0	260.4	159.7	42.7	36
279. Printing trade services		16.6	32.8	20.1	3.5	21

Table 5. -- (continued)

Industry	(dollars in millions)	Value added by Manufacturing			Real Change 1972-1977	
		<u>1972</u>	<u>1977</u>	<u>1977 (in 1972 dollars)*</u>	<u>Dollars</u>	<u>Percent Change</u>
Other 27, incl. newspapers, miscellaneous publishing, business forms, blank books, bookbinding		\$151.2	\$240.9	\$147.7	\$-3.5	-2%
<u>SIC 28. Chemicals and allied products</u>		267.0	384.5	235.8	-31.2	-12
2841. Soaps, other detergents		6.1	11.5	7.1	1.0	16
2851. Paints, allied products		20.9	17.1	10.5	-10.4	-50
287. Agricultural chemicals		9.7	22.8	14.0	4.3	44
289. Misc. chemical products		89.9	26.2	16.1	-73.8	-82
2893. Printers ink		3.7	11.5	7.1	3.4	92
Other 28, incl. plastic materials, synthetics, resins, drugs, polishes		140.4	306.9	188.2	47.8	34
<u>SIC 29. Petroleum and coal products</u>		74.0	260.9	160.0	86.0	116
<u>SIC 30. Rubber and miscellaneous plastics products</u>		128.2	244.0	149.6	21.4	17
3079. Misc. plastics products		106.5	210.7	129.2	22.7	21
Other 30, incl. rubber and plastic hose and belting; fabricated rubber products n.e.c.		21.7	33.3	20.4	-1.3	-6
<u>SIC 31. Leather and leather products</u>		D	54.6	33.5	NA	NA
<u>SIC 32. Stone, clay and glass products</u>		131.6	482.0	295.6	164.0	125
327. Concrete, gypsum, and plaster products		75.1	132.4	81.2	6.1	8
3271. Concrete block, bricks		11.6	21.3	13.1	1.5	13
3272. Concrete products, n.e.c.		37.2	62.8	38.5	1.3	3
3273. Ready-mixed concrete		26.3	48.3	29.6	3.3	13
3281. Cutstone, stone products		21.5	21.5	13.2	-8.3	-39
329. Misc. non-metallic mineral products, incl. abrasives; gaskets, packing, and sealing devices; mineral wool		10.8	269.1	165.0	154.2	1428
Other 32, incl. glass, glassware; glass products		24.2	59.0	36.2	12.0	50

Table 5. -- (continued)

Industry	(dollars in millions)	Value added by Manufacturing			Real Change 1972-1977	
		1972	1977	1977 (in 1972 dollars)*	Dollars	Percent Change
<u>SIC 33. Primary metal industries</u>		\$129.4	\$199.0	\$122.0	\$-7.4	-6%
331. Blast furnace, basic steel products		52.4	63.8	39.1	-13.3	-25
332. Iron and steel foundries		33.0	59.0	36.2	3.2	10
336. Non-ferrous foundries		32.2	48.1	29.5	-2.7	-8
3361. Aluminum foundries		28.5	42.1	25.8	-2.7	-9
339. Miscellaneous primary metal products		7.2	14.2	8.7	1.5	21
Other 33, incl. non-ferrous rolling and drawing		11.8	13.9	8.5	-3.3	-28
<u>SIC 34. Fabricated metal products</u>		578.5	842.8	516.9	-61.6	-11
341. Metal cans, shipping containers		60.7	126.3	77.5	16.8	28
342. Cutlery, hand tools, hardware		40.9	81.2	49.8	8.9	22
3423. Hand, edge tools, n.e.c.		26.1	49.2	30.2	4.1	16
Other 342. Hardware, n.e.c.		14.8	32.0	19.6	4.8	32
343. Plumbing, heating, exc. electric		12.8	8.8	5.4	-7.4	-58
344. Fabricated structural metal products		111.7	216.6	132.8	21.1	19
3441. Fabricated structural metal		33.7	54.1	33.2	-.5	-1
3442. Metal doors, parts, trim		12.5	17.5	10.7	-1.8	-14
3443. Fabricated plate (boiler shops)		21.1	67.7	41.5	20.4	97
3444. Sheet metal work		23.0	52.6	32.3	9.3	40
3449. Miscellaneous metal work		12.5	13.0	8.0	-4.5	-36
Other 344, incl. architectural metal		8.9	11.7	7.2	-1.7	-19
345. Screw machine products, bolts, etc.		21.7	39.3	24.1	2.4	11
346. Metal forgings and stampings		52.2	85.3	52.3	.1	0
347. Metal services: plating, polishing, coating, n.e.c.		19.8	38.6	23.7	3.9	20
348. Ordnance and accessories, n.e.c.		211.8	162.5	99.7	-112.1	-53
349. Miscellaneous fabricated metal products		47.1	84.4	51.8	4.7	10
3496. Miscellaneous fabricated wire products		8.4	4.0	2.5	-5.9	-70

Table 5. -- (continued)

Industry	(dollars in millions)	Value added by Manufacturing			Real Change 1972-1977	
		1972	1977	1977 (in 1972 dollars)*	Dollars	Percent Change
3499. Fabricated metal products, n.e.c.		\$12.2	\$32.5	\$20.0	\$7.2	64%
Other 349. Valves, pipefittings; metal foil and leaf		26.5	47.9	29.4	2.9	11
<u>SIC 35. Machinery, except electrical</u>		1,140.4	2,058.9	1,262.7	122.3	11
352. Farm, garden machinery		80.7	162.4	99.6	18.9	23
353. Construction, related machinery		117.0	221.0	135.5	18.5	16
3531. Construction machinery		88.0	165.9	101.7	13.7	16
3535. Conveyors, conveying equipment		12.9	23.4	14.4	1.5	12
3537. Industrial trucks, tractors		10.6	14.2	8.7	-1.9	-18
Other 353, incl. mining machinery, hoists, cranes, monorails		5.5	17.5	10.7	5.2	95
354. Metalworking machinery		61.2	114.8	70.4	9.2	15
3541. Machine tools, metal cutting types		9.3	40.1	24.6	15.3	165
3544. Special dies, tools, jigs, fixtures		24.2	29.4	18.0	-6.2	-26
3549. Metalworking machinery, n.e.c.		14.6	25.0	15.3	0.7	5
Other 354, incl. machine tools, metal forming types, and machine tool accessories		13.1	20.3	12.4	-0.7	-5
355. Special industry machinery		D	66.3	40.7	NA	NA
3551. Food products machinery		9.4	23.2	14.2	4.8	51
Other 355, incl. woodworking machinery		D	43.1	26.4	NA	NA
356. General industrial machinery		123.1	206.6	126.7	3.6	3
3561. Pumps, pumping equipment		60.2	101.3	62.1	1.9	3
3564. Blowers and fans		15.4	32.9	20.2	4.9	31
3566. Special changers, drives, gears		10.7	10.0	6.1	-4.9	-43
3568. Power transmission equipment		5.5	15.0	9.2	3.7	67
3569. General industrial machinery, n.e.c.		22.2	31.6	19.4	-2.8	-13
Other 356, incl. industrial patterns; furnaces and ovens		9.1	15.8	9.7	0.6	7
357. Office and computing machines		433.6	845.7	518.7	85.1	20

Table 5. -- (continued)

Industry	(dollars in millions)	Value added by Manufacturing			Real Change 1972-1977	
		1972	1977	1977 (in 1972 dollars)*	Dollars	Percent Change
358. Refrigeration and service machinery		\$178.9	\$266.2	\$163.3	\$-15.6	-9%
3585. Refrigeration and heating equipment		102.6	160.4	98.4	-4.2	-4
3589. Service industry machinery, n.e.c.		48.5	86.3	52.9	4.4	9
Other 358, incl. automatic merchandising machines; measuring and dispensing pumps; 359, miscellaneous machinery except electrical; carburetors, pistons, rings and valves		27.8	119.5	12.0	-15.8	-57
<u>SIC 36. Electric and electronic equipment</u>		354.9	869.8	533.4	178.5	50
361. Electrical distributing equipment		9.5	19.7	12.1	2.6	27
362. Electrical industrial apparatus		83.3	163.0	100.0	16.7	20
3621. Motors and generators		58.8	124.1	76.1	17.3	29
Other 362, incl. industrial controls, welding apparatus, electrical		24.5	38.9	23.9	-.6	-2
363. Household appliances		72.8	202.7	124.3	51.5	71
3643. Current carrying wire devices		3.4	6.0	3.7	0.3	9
366. Communication equipment		36.4	155.4	95.3	58.9	162
367. Electronic components, accessories		62.1	130.3	79.9	17.8	29
Other 36, incl. other 364: electric lighting and writing equipment; 365: radio and T.V. receiving equipment; 369: storage batteries, x-ray, electromedical, and electrotherapeutic apparatus, engine electrical equipment; electrical equipment n.e.c.		87.4	192.7	118.2	30.8	35
<u>SIC 37. Transportation equipment</u>		221.7	278.2	170.6	-51.1	-23
371. Motor vehicles and equipment		148.7	174.8	107.2	-41.5	-28
379. Miscellaneous transportation equipment		43.7	52.4	32.1	-11.6	-27
Other 37, incl. 372: aircraft and parts; 373: ship and boat building and repair		29.3	51.0	31.3	2.0	7

Table 5. -- (continued)

Industry	(dollars in millions)	Value added by Manufacturing			Real Change 1972-1977	
		<u>1972</u>	<u>1977</u>	<u>1977 (in 1972 dollars)*</u>	<u>Dollars</u>	<u>Percent Change</u>
<u>SIC 38. Instruments and related products</u>		\$225.9	\$415.7	\$254.9	\$29.0	13%
3811. Engineering and scientific instruments		12.9	29.5	18.1	5.2	40
3842. Surgical appliances and supplies		15.5	33.0	20.2	4.7	30
3851. Ophthalmic goods		8.7	22.5	13.8	5.1	59
Other 38, incl. 382: measuring and controlling devices; 383: optical instruments and lenses; other 384: medical instruments and supplies; and 386: photo equipment, supplies		188.8	330.7	202.8	14.0	7
<u>SIC 39. Miscellaneous manufacturing</u>		D	170.9	104.8	NA	NA
391. Jewelry, silverware, plated ware		8.4	10.1	6.2	-2.2	-26
394. Toys, sporting goods		55.6	109.0	66.8	11.2	20
3949. Sporting, athletic goods		29.0	28.1	17.2	-11.8	-41
3999. Manufacturing n.e.c.		12.0	12.6	7.7	-4.3	-36
Other 39. Miscellaneous.		D	11.1	6.8	NA	NA

D: Not published to avoid disclosing information on individual firms.

NA: Not available.

Source: U.S. Department of Commerce, Bureau of the Census, 1977 Census of Manufactures, Geographic Area Series (Minnesota), Table 5.

\*1977 dollars converted to (estimated) 1972 dollars using factor of .6133, the ratio of 1972 and 1977 PPI's. See text.

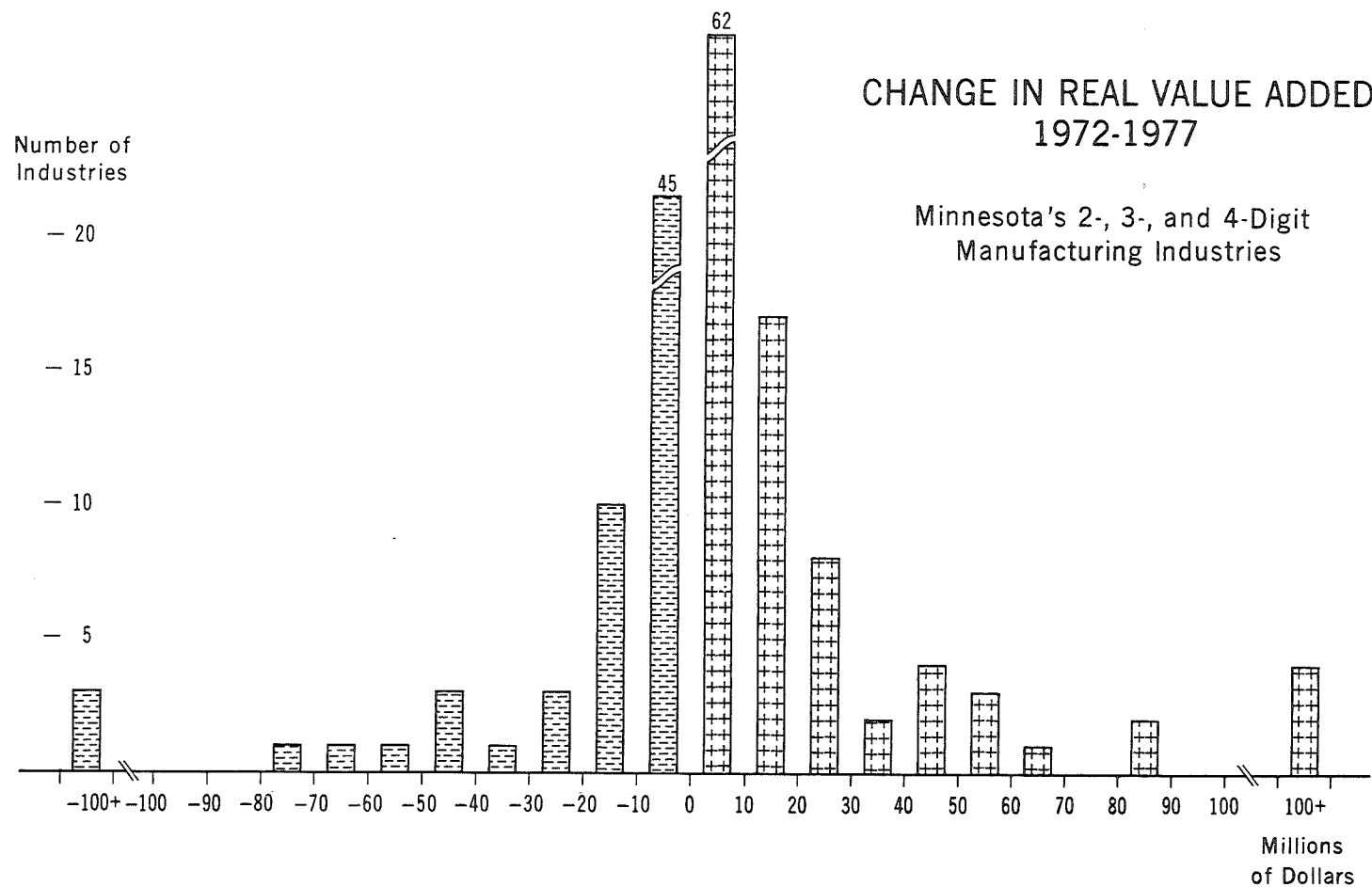


Figure 4. Changes in real value added by Minnesota's SIC 2-, 3, and 4-digit manufacturing industries, 1972-1977.

Thirteen industries had estimated declines exceeding \$20 million between 1972 and 1977 (also from Table 5):

SIC 26	Paper and allied products	-\$161.5 million
Other 26	Paper mills, paperboard, mills; converted paper products	- 156.6
348	Ordnance and accessories not elsewhere classified	- 112.1
289	Miscellaneous chemical products	- 73.8
34	Fabricated metal products	- 61.6
37	Transport equipment	- 51.1
2011	Meat packing plants	- 46.7
201	Meat products	- 42.7
371	Motor vehicles and equipment	- 41.5
28	Chemicals and allied products	- 31.2
208	Beverages	- 27.8
2026	Fluid milk	- 26.8
20	Food and kindred products	- 24.3

Minnesota industries also can be compared in terms of their percentage gains or declines in real value added (Figure 5). The percentage change in real value added per year in the fastest growing Minnesota manufacturing industries, 1972 to 1977 (and real value added in 1977, in millions), were (as extracted from Table 5):

Sectors with increases in real value added, 1972-1977, of 50 to 59%

SIC 2391	Curtains, draperies	(\$3.6)
Other 32	Including glass, glassware; glass glass products	(\$36.2)
3551	Food products machinery	(\$14.2)
36	Electric and electronic equipment	(\$533.4)
3851	Ophthalmic goods	(\$13.8)

Increases of 60 to 69%

SIC 207	Fats and oils	(\$63.2)
Other 239	Miscellaneous fabricated textile products	(\$2.7)
2411	Logging camps, contractors	(\$14.4)
3568	Power transmission equipment	(\$9.2)

Increases of 70 to 89%

SIC 233	Women's and misses' outerwear	(\$15.6)
363	Household appliances	(\$124.3)



Increases of 90 to 109%

SIC 2013	Sausages	(\$17.5)
2893	Printer's ink	(\$7.1)
3443	Fabricated plates (boiler shops)	(\$41.5)
Other 353	Including mining machinery, hoists, cranes, monorails	(\$10.7)

Increases of 110 to 119%

SIC 249	Miscellaneous wood and wood preserving	(\$41.8)
29	Petroleum and coal products	(\$160.0)
2337	Suits and coats	(\$13.2)

Increases of 120 to 129%

SIC 2022	Cheese	(\$77.2)
2038	Frozen specialties	(\$62.1)
32	Stone, clay, glass products	(\$295.6)

Increases of over 130%

SIC 2452	Prefabricated wood buildings	(\$19.3)
366	Communications equipment	(\$95.3)
3541	Machine tools, metal cutting type	(\$24.6)
329	Miscellaneous non-metallic mineral products, including abrasives; gaskets, packing and scaling devices; mineral wool	(\$165.0)

There were ten Minnesota manufacturing industries in which the measures of real value added in 1977 represented declines of over 50 percent from 1972 levels. These declining industries (and their estimated real value added in 1977, in millions) were (as extracted from Table 5):

SIC Other 203	Including pickles, sauces	(\$2.4)
289	Miscellaneous chemical products	(\$16.1)
2037	Frozen fruits, vegetables	(\$5.2)
3496	Miscellaneous fabricated wire products	(\$2.5)
2021	Creamery butter	(\$11.2)
Other 251	Metal furniture; radio, TV cabinets	(\$5.0)
2851	Paints, allied products	(\$10.5)
343	Plumbing, heating, except electrical	(\$5.4)
348	Ordinance and accessories, not elsewhere classified	(\$99.7)
Other 358	Including automatic merchandising machines; measuring and dispensing pumps; SIC 359: miscellaneous machinery except electrical; carburetors, pistons, rings, and valves	(\$12.0)

Number of  
Industries

— 25

— 20

— 15

— 10

— 5

# PERCENT CHANGE IN REAL VALUE ADDED 1972-1977

Minnesota's 2-, 3-, and 4-Digit  
Manufacturing Industries

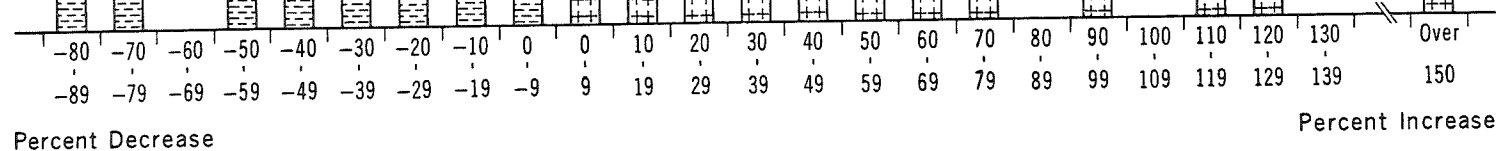


Figure 5. Percent change in real value added,  
Minnesota's SIC 2-, 3-, and 4-digit manufac-  
turing industries, 1972-1977.

Minnesota's Manufacturing in the Changing World Market

The value of goods and services is established most effectively in the market place. Goods and services are worth basically what willing buyers and willing sellers agree on, and when products move in international markets -- agriculture, forestry, fishing, mining, occasionally construction, and manufacturing markets -- prices are established internationally. Variations in world prices result from such factors as geographical accessibility, cartels and oligopolistic pricing, and trade restrictions. Production areas that are geographically distant from areas of consumption are usually penalized by a reduction in profits that results from the higher transportation costs that must be paid. Sometimes prices are artificially high because a small number of suppliers can collaborate to regulate most of the supply and administer a world price, as OPEC does with oil. And, frequently the countries of the world will restrict imports through taxes or quotas in order to keep domestic prices higher than world market prices, thereby providing a benefit to domestic producers in exchange for higher prices to consumers.

Each Minnesota manufacturer faces a unique set of local, national, and international market relationships. It is hard to generalize about them, except to say that in the past two decades, rapid economic development around the world -- especially in the booming market (i.e., not centrally planned) economies of East Asia, Southeast Asia, and Latin America -- has radically redefined the markets for Minnesota manufacturers. Formidable competitors have developed with astonishing speed and skill in these countries, yet at the same time these countries' rapidly growing levels of personal income have created large new sources of demand and prospective markets for Minnesota producers.

Some details on developments in the Pacific Basin will clarify the present challenge and the opportunities for Minnesota's manufacturers (Tables 6 and 7). There are 32 countries bordering on the Pacific Basin, with a combined population of 2.2 billion people. Some of the most populous countries are among those with the highest GNP growth rates (Table 6). Also noteworthy are the annual dollar increments to the GNPs of these countries (Table 7). Some of the increments are very large and, as already noted, indicate impressive potential markets for the state's manufacturers.

### Wholesale Trade

The greater Twin Cities region is the largest wholesale trade center between Wisconsin and the West Coast; and Minnesota wholesalers serve a market area that covers all or parts of over a dozen states. In wholesale trade volume, Minnesota ranked 14th among the 50 states and the District of Columbia in 1977, with \$29.1 billion in sales (Table 8, Figure 6).

### Wholesale Trade Volume, by State, 1977

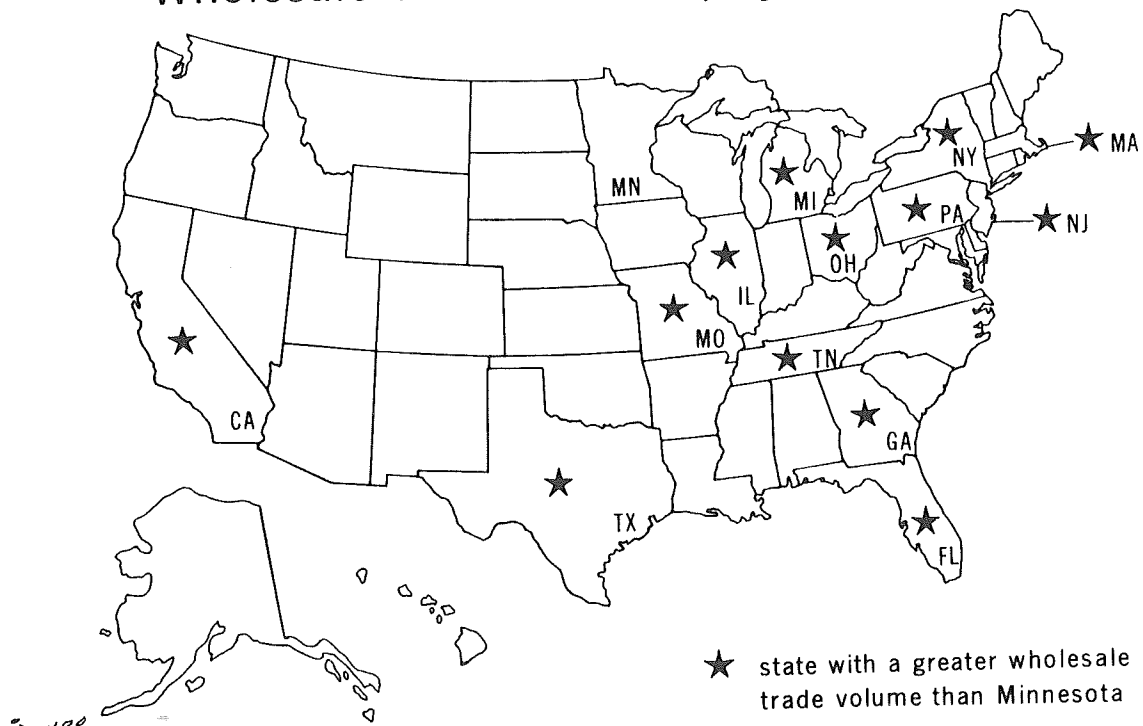


Figure 6

Table 6. -- Real GNP Growth Rates by Population Size Class, in the Pacific Basin

Population Size Class	Average Annual Real GNP Growth Rates, 1970-1976/77				Percentage of Pacific Basin Population
	Moderate (Less than 5%)	Fast (5-7%)	Very Fast (Over 7%)	No Report	
Largest: over 200 million	USSR USA	PRC			63%
Large: 100-200 million		Japan	Indonesia Brazil*		17
Medium: 20-100 million	Canada	Mexico Philippines Colombia	Thailand Rep. of Korea	Viet Nam	13
Small: under 20 million	Honduras Panama Peru Chile Australia New Zealand	Guatemala El Salvador Nicaragua Costa Rica Bolivia	N. Korea Taiwan Hong Kong Malaysia Singapore Ecuador	Laos Cambodia	7
					100%

Source: World Development Report, 1979. New York: Oxford University Press, for the World Bank, 1979.

\*Brazil, though not on the Pacific Ocean, has been included here because of its increasingly important trade relationships with the Pacific Basin community.

Table 7. -- Leading Pacific Basin Growth Areas in the 1970s

<u>Country</u>	<u>Average GNP Growth Per Year, 1970s (millions)</u>
Japan	\$49,422
US	44,986
USSR	28,929
People's Rep. of China	17,615
Brazil*	7,737
Canada	7,096
Rep. of Korea	2,184
Mexico	1,985
Indonesia	1,322
(Other 23)**	(under 1,000 each)

Source: World Development Report, 1979. New York: Oxford University Press for the World Bank, 1979.  
Calculations by the author.

\*Brazil is included here because of its increasingly important trade relationships with the Pacific Basin community.

\*\*See Table 6 for a complete listing of the "Other 23."

Table 8. -- Changes in Wholesale Trade,  
1972-1977, Minnesota and Other States

State	(dollars in billions)			Change in Real Sales	
	Sales				
	1972	1977	1977 (in 1972 dollars)*	Dollars	Percent Change
ME	\$1.9	\$2.8	\$1.7	\$-.2	-10%
NH	1.1	2.0	1.2	.1	12
VT	.7	1.0	.6	-.1	-12
MA	19.3	30.2	18.5	-.8	-4
RI	3.1	3.1	1.9	-1.2	-39
CT	8.8	19.2	11.8	3.0	34
NY	100.4	165.4	101.4	1.0	1
NJ	31.8	55.3	33.9	2.1	7
PA	32.4	53.7	32.9	.5	2
OH	33.7	61.7	37.8	4.1	12
IN	13.4	25.4	15.6	2.2	16
IL	52.8	97.1	59.6	6.8	13
MI	26.5	45.2	27.7	1.2	5
WI	10.8	19.6	12.0	1.2	11
MN	15.1	29.1	17.8	2.7	18
IA	10.0	20.1	12.3	2.3	23
MO	20.7	35.1	21.5	.8	4
ND	2.2	3.9	2.4	.2	9
SD	2.0	3.4	2.1	.1	4
NB	6.4	10.6	6.5	.1	2
KS	8.2	17.5	10.7	2.5	30
DE	2.5	5.2	3.2	.7	28
MD	10.2	16.9	10.4	.2	2
DC	1.7	2.2	1.3	-.4	-21
VA	10.3	19.1	11.7	1.4	14

Table 8. -- (continued)  
(dollars in billions)

State	Sales			Change in Real Sales	
	1972	1977	1977 (in 1972 dollars)*	Dollars	Percent Change
WV	\$2.4	\$4.5	\$2.8	\$.4	15%
NC	15.9	27.5	16.9	1.0	6
SC	4.7	8.3	5.1	.4	8
GA	19.8	35.2	21.6	1.8	9
FL	20.0	34.4	21.1	1.1	5
KY	7.0	13.5	8.3	1.3	18
TN	14.8	29.3	18.0	3.2	21
AL	7.5	14.2	8.7	1.2	16
MS	3.9	7.0	4.3	.4	10
AR	3.4	6.8	4.2	.7	23
LA	9.8	19.6	12.0	2.2	23
OK	6.8	13.4	8.2	1.4	21
TX	42.2	87.7	53.8	11.6	27
MT	1.6	3.0	1.8	.2	15
ID	1.3	3.2	2.0	.7	51
WY	.7	1.9	1.2	.5	66
CO	8.0	15.6	9.6	1.6	20
NM	1.5	2.7	1.7	.2	10
AZ	4.4	8.1	5.0	.6	13
UT	2.9	5.4	3.3	.4	14
NV	.9	1.7	1.0	.1	16
WA	10.0	19.9	12.2	2.2	22
OR	9.3	18.1	11.1	1.8	19
CA	68.6	128.6	78.9	10.3	15
AK	.6	1.6	1.0	.4	64
HI	1.6	2.6	1.6	.0	0
US	695.2	1,258.4	771.8	76.6	11

Source: U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1980, p. 849.

\*1977 dollars converted to (estimated) 1972 dollars using factor of .6133, the ratio of 1972 and 1977 PPI's. See text.



Five major considerations in the location of wholesale trade operations are:

- communications costs,
- the costs of holding inventories,
- transportation costs,
- the costs of handling and dispatching goods from wholesale inventories to retail distributors, and
- the changing geographic distribution of population, or final markets.

The improvements in communications systems and computerization of inventory control has promoted fewer but larger, more efficient wholesale units. At the same time, the recent rapid rise in fuel costs has raised the cost of air and truck transportation faster than the cost of rail transport, so wholesale centers that can serve as break-in-bulk distribution centers may once again have advantages over alternative wholesale centers near the import or manufacturing centers or near the final retail markets.

The possibly enhanced importance of break-in-bulk distribution centers may well be working to the advantage of Twin Cities wholesalers. Another factor possibly working to the advantage of Twin Cities wholesalers is that certain areas around the periphery of the Upper Midwest have been experiencing net immigration during the 1970s after suffering net losses of population through the migration mechanism for several decades. These areas include western and southwestern Montana, western and southwestern Wyoming, much of Idaho, and northwestern Colorado. Although these areas are at the margins of the Twin Cities' tributary wholesale market region, the apparent reputation for efficiency and reliability of Twin Cities workers and businesses may have enabled them to pick up some of the increased trade.

Nationally, wholesale sales rose 11 percent in real terms between 1972 and 1977. Minnesota stayed ahead of the national average by advancing 18 percent. Fifteen states grew at a faster percentage rate than Minnesota, while, at the bottom end of the spectrum, six states declined in real terms. When the same story is presented in terms of absolute changes, we find that Minnesota's wholesale trade volume rose \$2.7 billion in real terms, and that only six states had larger real rises in wholesale sales: Connecticut (\$3.0 billion), Ohio (\$4.1 billion), Illinois (\$6.8 billion), Tennessee (\$3.2 billion), Texas (\$11.6 billion), and California (\$10.3 billion) (Figure 7). The locations of these states that grew faster than Minnesota in real terms suggest that the large and occasionally fast-growing regions to the west, southwest, and south of Minnesota present the state's wholesalers with an opportunity for expansion.

### Change in Wholesale Trade Volume, by State, 1972-1977

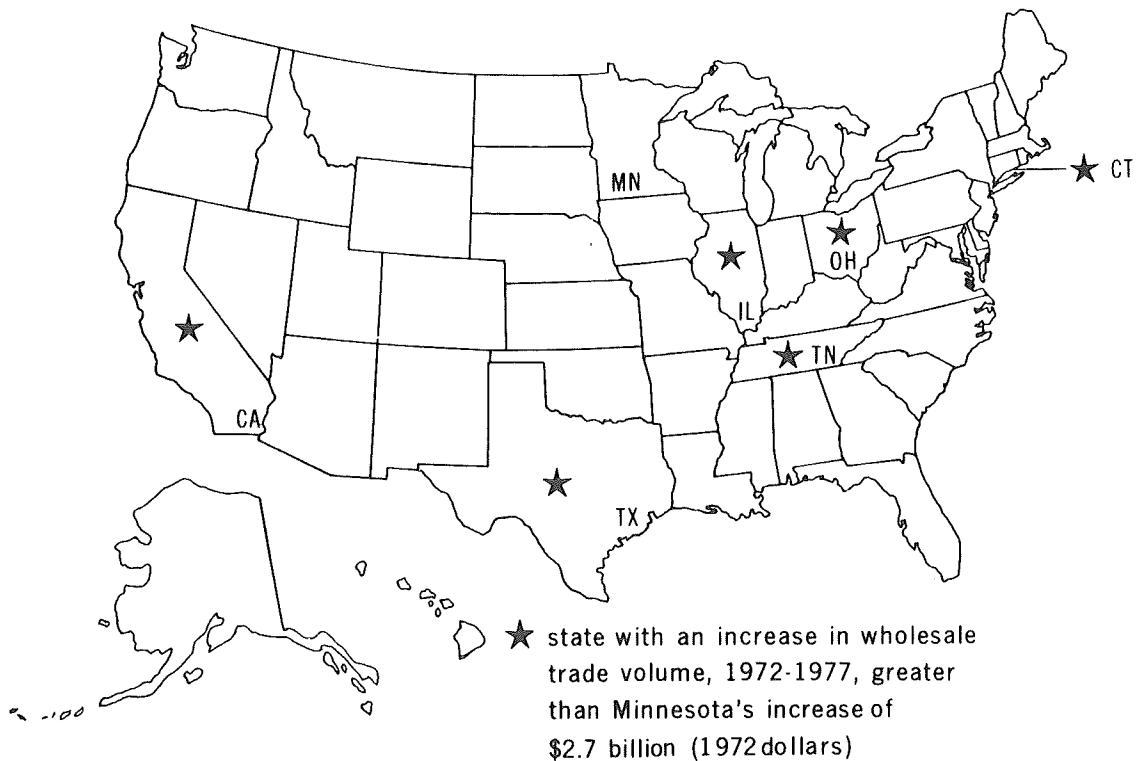


Figure 7

The major competitors within the region would be or are Wyoming and Colorado, in terms of percentage rates of growth, 1972-77, and Iowa and Illinois, in terms of dollar volume increase in real wholesale sales (Figure 8).

Productivity Changes in Minnesota's Wholesaling, 1972-1977

The change in real sales per wholesale trade establishment between 1972 and 1977 is one measure of performance that may help to assess productivity changes. Real sales per establishment rose 20 percent in Minnesota between 1972 and 1977. Only six states rose faster on this basis: Connecticut, 26 percent (no doubt absorbing some of New York's losses); Iowa, 33 percent (boosted by grain and farm equipment sales in the wake of sharply higher

## REAL CHANGE IN WHOLESALE TRADE 1972-1977

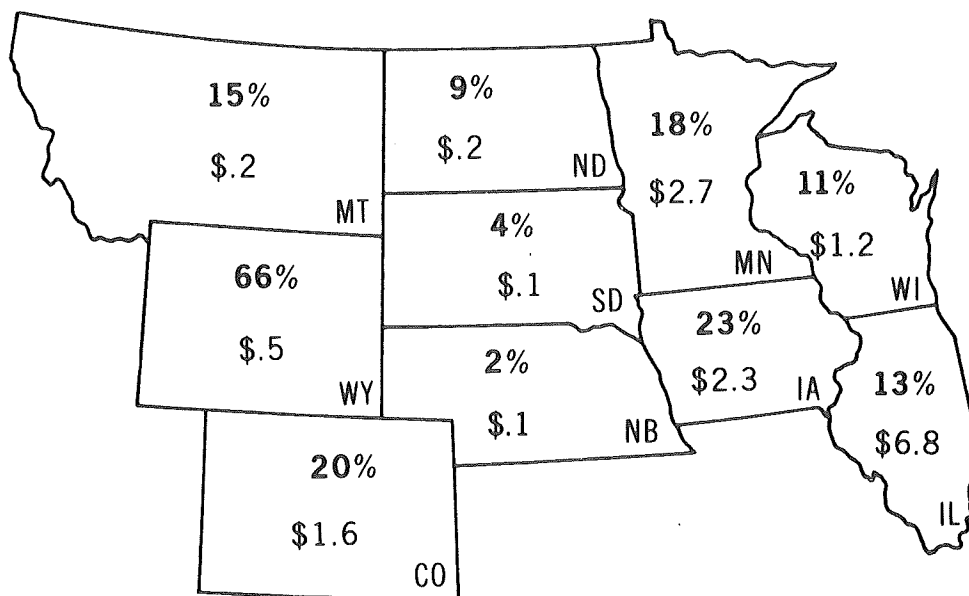


Figure 8. The regional competitors for Minnesota wholesalers: percentage growth in real wholesale sales and real growth in sales volume in billions of dollars, 1972-1977.

grain prices); Kansas, 29 percent (also affected by the fortunes of grain producers and the businesses that sell to them); Delaware, 21 percent (boosted by exceptional price increases for petroleum); Wyoming, 51 percent (as mining expanded on a small base); and Alaska, 24 percent (Table 9). To the extent that the wholesalers in these states specialize in commodities whose prices rose faster than the PPI between 1972 and 1977 (e.g., grain, imported oil, coal), the estimated increase in real sales per establishment is inflated due to disproportionate price increases rather than to any basic improvement in productivity.

The same caveat applies to state-by-state changes in real sales per employee. Between 1972 and 1977, real sales per employee in Minnesota rose by \$13,900. Only seven states saw greater increases (Connecticut, New York, Indiana, Iowa, Kansas, Delaware, and Wyoming), and only five states exceeded Minnesota's 8 percent growth rate (Connecticut, Indiana, Iowa, Delaware, and Wyoming).

#### Performance of Minnesota's Wholesale Trade Sectors

There were seventy-eight 2-, 3-, and 4-digit (SIC) wholesale trade sectors reported for Minnesota in the economic censuses of 1972 and 1977 (Table 10). The 1977 sales were adjusted to 1972 dollars to permit comparisons in real terms between 1972 and 1977. Seventeen Minnesota sectors each gained over \$100 million in annual real sales during the period (as extracted from Table 10):

SIC 51	Non-durable goods	\$1,648 million
508	Machinery, equipment, supplies	1,041
5153	Grain	1,018
515	Farm product raw materials	842
508	Commercial machines, equipment	410
519	Miscellaneous	363
5083	Farm, garden machinery, equipment	331

Table 9. -- Sales per Establishment and Sales per Employee,  
Wholesale Trade, 1972-1977, Minnesota and Other States  
(dollars in thousands)

State	Sales per Establishment					Sales per Employee				
	1972	1977	1977 (in 1972 dollars)*	Real \$	Change %	1972	1977	1977 (in 1972 dollars)*	Real \$	Change %
ME	\$1,161	\$1,792	\$1,099	\$-62	-5%	\$114	\$169	\$104	\$-10	-9%
NH	1,048	1,655	1,015	-33	-3	113	167	102	-11	-9
VT	938	1,389	852	-86	-9	107	147	90	-17	-16
MA	2,092	3,320	2,036	-56	-3	167	267	164	-3	-2
RI	1,401	2,078	1,274	-127	-9	130	183	112	-18	-14
CT	1,988	4,098	2,513	525	26	165	325	199	34	21
NY	2,511	4,335	2,659	148	6	229	403	247	18	8
NJ	2,709	4,257	2,611	-98	-4	195	304	186	-9	-4
PA	1,826	3,063	1,879	53	3	157	254	156	-1	-1
OH	2,014	3,707	2,274	260	13	173	291	178	5	3
IN	1,507	2,866	1,758	251	17	145	261	160	15	10
IL	2,457	4,571	2,803	346	14	203	346	212	9	5
MI	2,070	3,591	2,202	132	6	194	319	196	2	1
WI	1,316	2,495	1,530	214	16	143	227	139	-4	-3
MN	1,727	3,373	2,069	342	20	175	308	189	14	8
IA	1,215	2,626	1,611	396	33	162	293	180	18	11
MO	2,043	3,506	2,150	107	5	188	303	186	-2	-1
ND	933	1,830	1,122	189	20	153	229	140	-13	-8
SD	938	1,793	1,100	162	17	148	220	135	-13	-9
NB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KS	1,546	3,264	2,002	456	29	184	324	199	15	8
DE	3,387	6,696	4,107	720	21	222	414	254	32	14
MD	2,152	3,367	2,065	-87	-4	162	252	155	-7	-5
DC	2,337	3,628	2,225	-112	-5	131	198	121	-10	-7
VA	1,779	3,052	1,872	93	5	144	241	148	4	3
WV	1,065	1,894	1,162	97	9	103	177	109	6	5
NC	1,789	2,875	1,763	-261	-1	160	255	156	-4	-2
SC	1,208	2,010	1,233	25	2	125	197	121	-4	-3
GA	2,112	3,492	2,142	30	1	184	298	183	-1	-1
FL	1,486	2,231	1,368	-118	-8	137	216	132	-5	-3

Table 9. -- (continued)

(dollars in thousands)

State	Sales per Establishment					Sales per Employee				
	1972	1977	1977 (in 1972 dollars)*	Real \$	Change %	1972	1977	1977 (in 1972 dollars)*	Real \$	Change %
KY	\$1,491	\$2,627	\$1,611	\$120	8%	\$147	\$240	\$147	\$0	0%
TN	2,119	3,953	2,424	305	14	181	317	194	13	7
AL	1,387	2,483	1,523	136	10	135	223	137	2	1
MS	1,131	1,943	1,192	61	5	124	193	118	-6	-5
AR	960	1,847	1,133	173	18	116	199	122	6	5
LA	1,528	2,878	1,765	237	16	143	241	148	5	3
OK	1,308	2,445	1,500	192	15	152	251	154	2	1
TX	1,734	3,325	2,039	305	18	162	283	174	12	7
MT	876	1,636	1,003	127	15	125	209	128	3	3
ID	897	1,568	962	65	7	103	157	96	-7	-6
WY	894	2,207	1,354	460	51	155	316	194	39	25
CO	1,689	2,862	1,755	66	4	162	257	158	-4	-3
NM	857	1,378	845	-12	-1	112	157	96	-16	-14
AZ	1,417	2,256	1,384	-33	-2	138	207	127	-11	-8
UT	1,402	2,330	1,429	27	-2	138	202	124	-14	-10
NV	1,124	1,757	1,078	-46	-4	127	184	113	-14	-11
WA	1,532	2,800	1,717	185	12	153	259	159	6	4
OR	2,023	3,688	2,262	239	12	192	333	204	12	6
CA	2,114	3,504	2,149	35	2	176	287	176	0	0
AK	1,194	2,408	1,477	283	24	173	251	154	-19	-11
HI	1,168	1,639	1,005	-163	-14	106	175	107	1	1

NA: Not available.

Source: U.S. Department of Commerce, Bureau of the Census, 1977 Census of Wholesale Trade, Geographic Area Series, Table 3.

\*1977 dollars converted to (estimated) 1972 dollars using factor of .6133, the ratio of 1972 and 1977 PPI's. See text.

Table 10. -- Wholesale Trade in Minnesota, 1972 and 1977

Industry (dollars in millions)	Sales			Real Change	
	1972	1977	1977 (in 1972 dollars)*	Dollars	Percent Change
<u>SIC 50. Durable goods</u>	\$7,220	\$13,631	\$8,360	\$1,140	16%
501. Motor vehicles, parts, supplies	1,915	3,240	1,987	72	4
5012. Autos, other motor vehicles	1,324	2,363	1,449	125	9
5013. Auto parts, supplies	422	725	445	23	5
5014. Tires, tubes	152	169	104	-48	-32
502. Furniture, home furnishings	256	453	278	22	9
5021. Furniture	73	152	93	20	28
5023. Home furnishings	183	301	184	2	1
503. Lumber, other construction materials	606	1,183	726	120	20
5031. Lumber, plywood, millwork	333	656	402	69	21
5039. Construction materials n.e.c.	272	527	323	51	19
504. Sporting, recreational, photographic, hobby goods, toys, supplies	238	380	233	-5	-2
5041. Sporting, recreational goods, supplies	161	316	194	33	20
5042. Toy, hobby goods, supplies	22	34	21	-1	-5
5043. Photo equipment, supplies	54	30	18	-36	-66
505. Metals and minerals, except petroleum	628	979	600	-28	-4
5051. Metals service centers	597	887	544	-53	-9
5052. Coal, other minerals, ores	32	92	56	24	76
506. Electrical goods	1,008	1,432	878	-130	-13
5063. Electrical apparatus, equipment	601	735	451	-150	-25
5064. Electrical appliances, television and radio sets	238	281	172	-66	-28
5065. Electronic parts, equipment	169	416	255	86	51
507. Hardware, plumbing and heating, equipment and supplies	414	602	369	-45	-11
5072. Hardware	189	181	111	-78	-41
5074. Plumbing and heating equipment, supplies (hydronics)	155	273	167	12	8
5075. Warm air heating, air conditioning equipment, supplies	53	86	53	0	0
5078. Refrigeration equipment, supplies	18	61	37	19	108

Table 10. -- (continued)

Industry	(dollars in millions)	Sales			Real Change	
		1972	1977	1977 (in 1972 dollars)*	Dollars	Percent Change
508. Machinery, equipment, supplies		\$1,951	\$4,879	\$2,992	\$1,041	53%
5081. Commercial machines, equipment		181	964	591	410	227
5082. Construction, mining machinery, equipment		145	342	210	65	45
5083. Farm, garden machinery, equipment		745	1,755	1,076	331	44
5084. Industrial machinery, equipment		254	566	347	93	37
5085. Industrial supplies		330	775	475	145	44
5086. Professional equipment, supplies		150	272	167	17	11
5087. Service establishment equipment, supplies		90	82	50	-40	-44
5088. Transport equipment, supplies, except motor vehicles		55	123	75	20	37
509. Miscellaneous durable goods		204	484	297	93	46
5093. Scrap, waste materials		77	140	86	9	12
5094. Jewelry, watches, diamonds, other precious stones		24	52	32	8	33
5099. Durable goods, n.e.c.		103	293	180	77	74
<u>SIC 51. Non-durable goods</u>		7,834	15,461	9,482	1,648	21
511. Paper, paper products		331	465	285	-46	-14
5111. Printing, writing paper		100	210	129	29	29
5112. Stationery supplies		113	94	58	-55	-49
5113. Industrial, personal service paper		119	162	99	-20	-17
512. Drugs, drug proprietaries, druggist sundries		196	271	166	-30	-15
513. Apparel, piece goods, notions		182	270	166	-16	-9
5133. Piece goods (woven fabrics)		41	38	23	-18	-43
5134. Notions, other dry goods		22	18	11	-11	-50
5136. Mens, boys clothing, furnishings		50	71	44	-6	-13
5137. Women's, children's, infants' clothing, accessories		60	121	74	14	24
5139. Footwear		9	22	13	4	50



Table 10. -- (continued)

Industry (dollars in millions)	Sales			Real Change	
	1972	1977	1977 (in 1972 dollars)*	Dollars	Percent Change
514. Groceries, related products	\$2,247	\$4,194	\$2,572	\$325	14%
5141. Groceries, general line	324	911	559	235	72
5142. Frozen foods	253	314	193	-60	-24
5143. Dairy products	250	461	283	33	13
5144. Poultry, poultry products	69	125	77	8	11
5145. Confectionery	69	133	82	13	18
5146. Fish, seafood	14	33	20	6	45
5147. Meat, meat products	318	492	302	-16	-5
5148. Fresh fruits, vegetables	113	241	148	35	31
5149. Groceries, related products n.e.c.	837	1,483	910	73	9
515. Farm product raw materials	2,374	5,243	3,216	842	35
5152. Cotton	-	-	-	-	-
5153. Grain	1,519	4,137	2,537	1,018	67
5154. Livestock	801	1,047	642	-159	-20
5159. Farm product raw materials n.e.c.	53	58	36	-17	-33
516. Chemicals, allied products	245	570	350	105	43
517. Petroleum, petroleum products	714	1,517	930	216	30
5171. Petroleum bulk stations, terminals	450	1,201	737	287	64
5172. Petroleum, petroleum products, except bulk stations and terminals	265	316	194	-71	-27
518. Beer, wines, distilled alcoholic beverages	361	409	251	-110	-31
5181. Beer, ale	103	191	117	14	14
5182. Wines, distilled alcoholic beverages	258	219	134	-124	-48
519. Miscellaneous non-durable goods	1,184	2,522	1,547	363	31
5191. Farm supplies	632	1,327	814	182	29
5194. Tobacco, tobacco products	161	157	96	-65	-40
5198. Paints, varnishes, supplies	37	80	49	12	33
5199. Non-durable goods, n.e.c.	353	959	588	235	67
All wholesale trade in Minnesota	15,054	29,092	17,842	2,738	19

Source: U.S. Department of Commerce, Bureau of the Census, 1977 Census of Wholesale Trade, Geographic Area Series (Minnesota), Table 2.

\*1977 dollars converted to (estimated) 1972 dollars using factor of .6133, the ratio of 1972 and 1977 PPI's. See text.

5083	Groceries, related products	\$325 million
5171	Petroleum bulk stations, terminals	287
5199	Nondurable goods, not elsewhere classified	235
5141	Groceries, general line	235
517	Petroleum, petroleum products	216
5191	Farm supplies	182
5085	Industrial supplies	145
5012	Autos, other motor vehicles	125
503	Lumber, other construction materials	120
516	Chemicals, allied products	105

At the other end of the ranking there were 12 Minnesota wholesale sectors that had declines in real sales of over \$50 million (also from Table 10):

SIC 5154	Livestock	-159 million
5063	Electrical apparatus, equipment	-150
506	Electrical goods	-130
5182	Wines, distilled alcoholic beverages	-124
518	Beer, wines, distilled alcoholic beverages	-110
5072	Hardware	-78
5172	Petroleum, petroleum products, except bulk stations and terminals	-71
5064	Electrical appliances, television and radio sets	-66
5194	Tobacco, tobacco products	-65
5142	Frozen foods	-61
5112	Stationery supplies	-55
5051	Metals service centers	-53

Gains in real sales more than matched the losses, resulting in a real increase of \$2.8 billion in Minnesota's wholesale trade sales between 1972 and 1977. Of the total of 78 wholesale sectors, 49 gained, 28 lost, and one stayed the same. Durable goods wholesaling rose \$1.1 billion in real terms, an increase of 16 percent. Nondurable goods rose by \$1.6 billion, up 21 percent.

### Retail Trade

#### Minnesota's Retail Trade Performance

In the 1972-77 period, retail sales in the United States dropped 2 percent, or \$11.1 billion in constant (1972) dollars. Twenty-four states and the District of Columbia shared in the decline. Twenty-six states, including Minnesota, had a rise in real sales, led by Texas (\$2.7 billion

rise), California (\$.8 bil.), and Washington (\$.8 bil.). Minnesota's real increase of about 1 percent added \$.1 billion to the 1972 total of \$8.0 billion (Table 11). The states that lost the most in real sales were New York (-\$7.4 bil.), New Jersey (-\$1.8 bil.), Massachusetts (-\$1.8 bil.), Pennsylvania (-\$1.4 bil.), Michigan (-\$.9 bil.), and Ohio (-\$.9 bil.).\* There is a rough correspondence between the direction of change in retail sales and the geographical patterns of population redistribution through net migration in the 1970s (Figure 9). In this broad national picture, Minnesota retailing appears to have done better than the average, rising in real volume while the U.S. total was slipping.

In the face of both a generally depressed economy that featured stagnation of retailers' real sales and upward pressures for improved real profits and wages, efforts were sometimes made to improve productivity, i.e., to raise real sales per establishment and to increase real sales per employee. Despite these efforts, only 19 states had increases in real sales per establishment between 1972 and 1977 (Table 12). Minnesota managed a real increase from \$332,000 to \$335,000, an increase of about 1 percent. The biggest real increases were registered by Alaska, \$59,000 (oil and pipeline boom); Wyoming, \$40,000 (coal); West Virginia, \$20,000 (coal); and North Dakota, \$21,000 (grain price rise). The worse declines occurred in the District of Columbia, -\$115,000 (outmigration of affluent households); New York, -\$55,000 (outmigration); Vermont, -\$50,000; Maryland, -\$59,000; and New Jersey, -\$71,000. In general it appears that old firms are slow to

---

\*The reader will recall when considering these figures as well as those in the following analyses that the PPI, which was used to deflate 1977 sales figures, is an average index for all commodities. It will be too high for some states and too low for others, depending on the extent to which a state's retail trade is specialized in the various lines represented (in different proportions) in the PPI.

Table 11. -- Changes in Retail Trade,  
1972-1977, Minnesota and Other States

(dollars in billions; establishments with payroll)

State	Sales			Change in Real Sales	
	1972	1977	1977 (in 1972 dollars)*	Dollars	Percent Change
ME	\$2.1	\$3.5	\$2.1	\$-.0	-0%
NH	2.0	3.3	2.0	.0	0
VT	1.1	1.6	1.0	-.1	-11
MA	12.8	17.9	11.0	-1.8	-14
RI	1.9	2.7	1.7	-.2	-13
CT	6.9	10.1	6.2	-.7	-10
NY	37.5	49.0	30.1	-7.4	-20
NJ	16.2	23.5	14.4	-1.8	-11
PA	23.4	35.9	22.0	-1.4	-6
OH	22.2	34.7	21.3	-.9	-4
IN	11.1	17.8	10.9	-.2	-2
IL	25.1	38.2	23.4	-1.7	-7
MI	20.0	31.1	19.1	-.9	-5
WI	8.9	14.4	8.8	-.1	-1
MN	8.0	13.2	8.1	.1	1
IA	5.7	9.5	5.8	.1	2
MO	9.9	15.3	9.4	-.5	-5
ND	1.2	2.2	1.3	.1	12
SD	1.3	2.1	1.3	-.0	-1
NB	3.1	5.0	3.1	-.0	-1
KS	4.5	7.4	4.5	.0	1
DE	1.4	2.1	1.3	-.1	-8
MD	9.0	14.1	8.6	-.4	-4
DC	1.8	2.1	1.3	-.5	-28
VA	9.8	16.1	9.9	.1	1

Table 11. -- (continued)  
(dollars in billions; establishments with payroll)

State	Sales			Change in Real Sales	
	1972	1977	1977 (in 1972 dollars)*	Dollars	Percent Change
WV	\$3.2	\$5.5	\$3.4	\$.2	5%
NC	10.1	16.1	9.9	-.2	-2
SC	4.9	7.9	4.8	-.1	-1
GA	10.0	15.3	9.4	-.6	-6
FL	18.9	30.5	18.7	-.2	-1
KY	5.8	10.0	6.1	.3	6
TN	8.1	13.1	8.0	-.1	-1
AL	6.2	10.2	6.2	.1	1
MS	3.7	5.8	3.6	-.1	-4
AR	3.6	6.0	3.7	.1	2
LA	6.8	12.0	7.4	.6	8
OK	5.2	8.8	5.4	.2	4
TX	24.5	44.3	27.2	2.7	11
MT	1.5	2.7	1.7	.2	10
ID	1.6	2.9	1.8	.2	11
WY	.8	1.6	1.0	.2	23
CO	5.7	9.5	5.8	.1	2
NM	2.2	3.9	2.4	.2	9
AZ	4.6	8.0	4.9	.3	7
UT	2.3	4.0	2.5	.2	7
NV	1.6	3.0	1.8	.2	15
WA	7.3	13.2	8.1	.8	11
OR	5.0	9.1	5.6	.6	12
CA	47.5	78.7	48.3	.8	2
AK	.7	1.8	1.1	.4	58
HI	1.8	3.2	2.0	.2	9
US	440.2	699.6	429.1	-11.1	-2

Source: U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1980, p. 844.

Note: Establishments with payroll accounted for well over 90 percent of U.S. total retail sales, with the proportion rising 1972-1977.

\*1977 dollars converted to (estimated) 1972 dollars using factor of .6133, the ratio of 1972 and 1977 PPI's. See text.

Table 12. -- Sales per Establishment and Sales per Employee,  
Retail Trade, 1972-1977, Minnesota and Other States

(dollars in thousands; establishments with payroll)

State	Sales per Establishment					Sales per Employee				
	1972	1977	1977 (in 1972 dollars)*	Real \$	Change %	1972	1977	1977 (in 1972 dollars)*	Real \$	Change %
ME	\$295	\$458	\$281	\$-14	-5%	\$41	\$57	\$35	\$-6	-15%
NH	353	526	323	-30	-9	43	57	35	-8	-19
VT	295	399	245	-50	-17	42	54	33	-9	-21
MA	365	522	320	-45	-12	35	48	29	-6	-16
RI	325	464	285	-40	-12	36	50	31	-5	-15
CT	359	535	328	-31	-9	39	53	33	-6	-17
NY	349	480	294	-55	-16	40	53	33	-7	-19
NJ	405	545	334	-71	-17	41	57	35	-6	-15
PA	349	538	330	-19	-5	38	53	33	-5	-14
OH	366	580	356	-10	-3	38	53	33	-5	-14
IN	360	565	347	-13	-4	38	54	33	-5	-13
IL	406	633	388	-18	-4	39	52	32	-7	-18
MI	407	642	394	-13	-3	43	59	36	-7	-16
WI	296	484	297	1	0	35	48	29	-6	-16
MN	332	546	335	3	1	36	49	30	-6	-16
IA	265	452	277	12	5	36	50	31	-5	-15
MO	325	506	310	-15	-5	38	52	32	-6	-16
ND	248	438	269	21	8	39	51	31	-8	-20
SD	222	387	237	15	7	37	50	31	-6	-17
NB	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
KS	267	450	276	9	3	38	50	31	-7	-19
DE	388	553	339	-49	-13	40	54	33	-7	-17
MD	466	663	407	-59	-13	40	54	33	-7	-17
DC	470	579	355	-115	-24	33	44	27	-6	-18
VA	398	586	359	-39	-10	39	54	33	-6	-15
WV	309	537	329	20	7	42	61	37	-5	-11
NC	317	469	288	-29	-9	41	55	34	-7	-18
SC	307	456	280	-27	-9	42	54	33	-9	-21
GA	334	494	303	-31	-9	41	55	33	-8	-19
FL	371	534	328	-43	-11	40	50	31	-9	-23

Table 12. -- (continued)

(dollars in thousands; establishments with payroll)

State	Sales per Establishment					Sales per Employee				
	1972	1977	1977 (in 1972 dollars)*	Real Change \$	%	1972	1977	1977 (in 1972 dollars)*	Real Change \$	%
KY	\$320	\$494	\$303	\$-17	-5%	\$40	\$56	\$34	\$-6	-14%
TN	328	502	308	-20	-6	41	56	34	-7	-16
AL	299	471	289	-10	-3	42	56	34	-8	-18
MS	259	406	249	-10	-4	43	56	34	-9	-20
AR	265	423	259	-6	-2	43	57	35	-8	-19
LA	326	538	330	4	1	39	55	34	-5	-14
OK	281	463	284	3	1	38	54	33	-5	-13
TX	313	532	326	13	4	38	55	34	-4	-11
MT	253	431	264	11	4	40	55	34	-6	-16
ID	273	472	289	16	6	40	55	34	-6	-16
WY	250	473	290	40	16	39	58	36	-3	-8
CO	359	527	323	-35	-10	39	50	31	-8	-21
NM	296	490	301	5	2	38	52	32	-6	-16
AZ	370	565	347	-23	-6	39	52	32	-7	-18
UT	342	563	345	3	1	37	50	31	-6	-17
NV	394	655	402	8	2	43	62	38	-5	-12
WA	336	571	350	14	4	40	57	35	-5	-13
OR	332	564	346	14	4	40	57	35	-5	-13
CA	386	605	371	-15	-4	41	57	35	-6	-15
AK	392	735	451	59	15	50	68	42	-8	-17
HI	405	611	375	-30	-7	30	45	28	-2	-8
US	348	537	329	-19	-5	39	54	33	-6	-15

NA: Not available.

Source: U.S. Department of Commerce, Bureau of the Census, 1977 Census of Retail Trade, Geographic Area Series, Table 3.

Note: Establishments with payroll accounted for well over 90 percent of U.S. total retail sales, with the proportion rising 1972-1977.

\*1977 dollars converted to (estimated) 1972 dollars using factor of .6133, the ratio of 1972 and 1977 PPI's. See text.

## Change in Retail Trade Volume, by State, 1972-1977

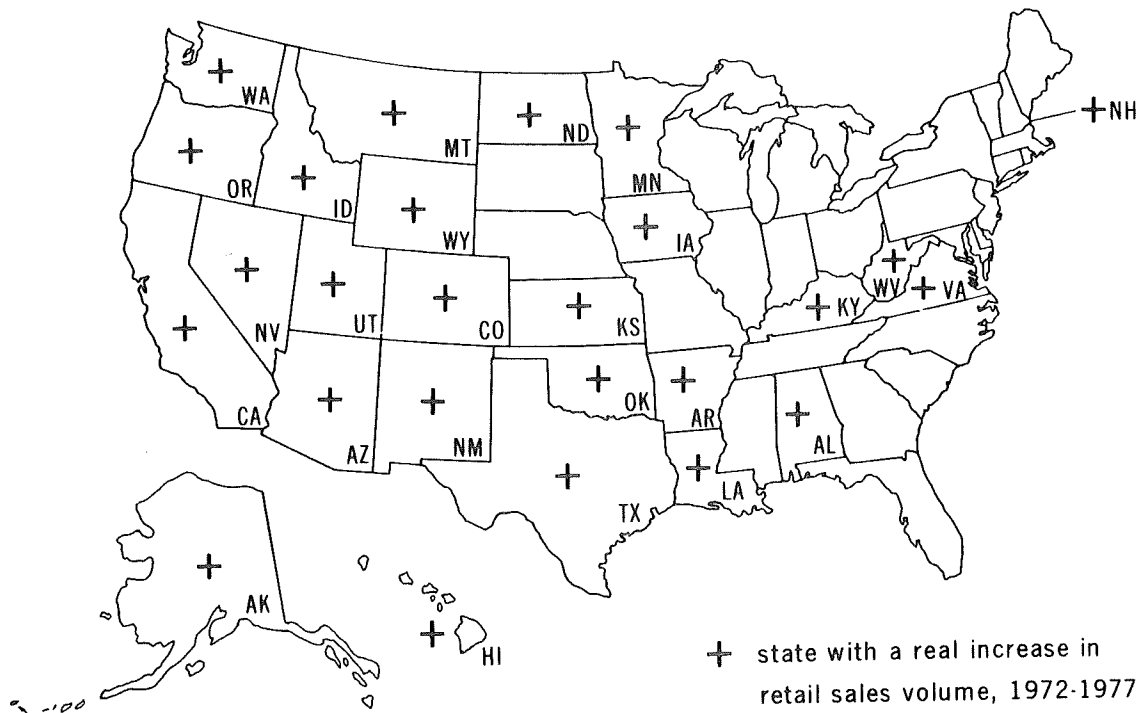


Figure 9

leave a market area when population and purchasing power drop, but new firms enter quickly in rapidly growing, prosperous markets such as Colorado and Florida. In both cases, sales per establishment can drop sharply over a short period.

There is a remarkable uniformity from state to state in the statistics on sales per employee (Table 12). The U.S. average was \$39,000 in 1972 and \$54,000 in 1977. When the 1977 value is deflated to 1972 dollars, it becomes \$33,000, a drop in real terms of \$6,000 or 15 percent. Part of the state-to-state uniformity in these numbers is probably due to the ease with which retailers with payroll are able to adjust their work force and hours worked to market conditions. Establishments, on the other hand, are somewhat harder to get started and even slower to disappear when markets weaken, so sales per establishment show more variability than sales per employee.



### Performances of Minnesota's Retail Trade Sectors

Even though there was considerable uniformity from state to state in real sales per employee, and virtually no real change in retail sales in Minnesota between 1972 and 1977, there were important performance differences within the state across its sixty-five 2-, 3-, and 4-digit (SIC) retail sectors. Twenty-two Minnesota retail sectors had estimated real increases or decreases of at least \$25 million in sales during the period (Table 13). The following sectors (as extracted from Table 13) exhibited the largest increases:

SIC 551	Motor vehicle dealers, new and used cars	\$147 million
55	(except 554) Automotive dealers	146
521	Lumber, other building materials dealers	103
5812	Eating places	94
52	Building materials, hardware, garden supply, mobile home dealers	91
594	Miscellaneous shopping good stores	49
554	Gasoline service stations	30
598	Fuel and ice dealers	29

The major declines in estimated real annual sales occurred in 14 sectors (also from Table 13):

SIC 596	Non-store retailers	\$-125 million
5961	Mail order houses	-108
53	General merchandise group stores	-102
59	(except 591) Miscellaneous retail stores	-86
54	Food stores	-70
58	Eating and drinking places	-63
531	Department stores	-52
592	Liquor stores	-42
5712	Furniture stores	-32
571	Furniture, home furnishing stores	-32
541	Grocery stores	-31
5813	Drinking places	-31
539	Miscellaneous general merchandise	-27
57	Furniture, home furnishings, equipment stores	-25

The performance of these retail sectors are consequences of larger trends and changes in American society. Higher international prices for oil raised sales levels for gas stations and fuel dealers. Smaller households and a

Table 13. -- Retail Trade in Minnesota, 1972 and 1977

Industry (dollars in millions; establishments with payroll)	Sales			Real Change	
	<u>1972</u>	<u>1977</u>	<u>1977 (in 1972 dollars)*</u>	<u>Dollars</u>	<u>Percent Change</u>
<u>SIC 52. Building materials, hardware, garden supply, mobile home dealers</u>	\$584	\$1,100	\$675	\$91	16%
521. Lumber, other building materials dealers	361	757	464	103	29
523. Paint, glass, wallpaper stores	24	37	23	-1	-5
525. Hardware stores	127	203	124	-3	-2
526. Retail nurseries, lawn and garden stores	10	27	17	7	67
527. Mobile home dealers	62	75	46	-16	-26
<u>SIC 53. General merchandise group stores</u>	1,234	1,845	1,132	-102	-8
531. Department stores	992	1,533	940	-52	-5
533. Variety stores	92	113	69	-23	-25
539. Miscellaneous general merchandise	149	199	122	-27	-18
<u>SIC 54. Food stores</u>	1,539	2,396	1,469	-70	-5
541. Grocery stores	1,418	2,261	1,387	-31	-2
542. Meat, fish markets, including freezer provisioners	54	52	32	-22	-41
543. Fruit stores, vegetable markets	6	7	4	-2	-28
544. Candy, nut, confectionery stores	6	7	4	-2	-28
545. Dairy products stores	20	18	11	-9	-44
546. Retail bakeries	29	43	26	-3	-9
549. Miscellaneous food stores	5	9	6	1	10
<u>SIC 55, except 554. Automotive dealers</u>	1,479	2,649	1,625	146	10
551. Motor vehicle dealers, new, used cars	1,243	2,266	1,390	147	12
552. Motor vehicle dealers, used cars only	42	55	34	-8	-20
553. Auto, home supply stores	87	148	91	4	4
555. Boat dealers	44	68	42	-2	-5

Table 13. -- (continued)

Industry (dollars in millions; establishments with payroll)	Sales			Real Change	
	1972	1977	1977 (in 1972 dollars)*	Dollars	Percent Change
556. Recreational, utility trailer dealers	\$26	\$60	\$37	\$11	42%
557. Motorcycle dealers	21	41	25	4	20
559. Automotive dealers n.e.c.	15	10	6	-9	-59
<u>SIC 554. Gasoline service stations</u>	673	1,146	703	30	4
<u>SIC 56. Apparel and accessory stores</u>	361	585	359	-2	-1
561. Men's, boys' clothing, furnishings stores	83	126	77	-6	-7
562. Women's ready-to-wear stores	125	188	115	-10	-8
563, 8. Women's accessory and specialty stores, furriers	10	17	10	0	0
564. Children's, infants' wear	5	8	5	0	0
565. Family clothing stores	83	159	98	15	17
566. Shoe stores	51	78	48	-3	-6
569. Miscellaneous apparel and accessory stores	3	10	6	3	104
<u>SIC 57. Furniture, home furnishings, and equipment stores</u>	360	546	335	-25	-7
571. Furniture, home furnishings stores	219	305	187	-32	-15
5712. Furniture stores	162	212	130	-32	-20
5713. Floor covering stores	44	71	44	0	-1
5714. Drapery, curtains, upholstery stores	6	6	4	-2	-39
5719. Miscellaneous home furnishings stores	7	16	10	3	40
572. Household appliance stores	61	78	48	-13	-22
573. Radio, TV, music stores	80	163	100	20	25
<u>SIC 58. Eating and drinking places</u>	628	1,126	691	63	10
5812. Eating places	478	932	572	94	20
5813. Drinking places (alcoholic beverages)	150	194	119	-31	-21
<u>SIC 59, except 591. Miscellaneous retail stores</u>	950	1,408	864	-86	-9

Table 13. -- (continued)

Industry (dollars in millions; establishments with payroll)	Sales			Real Change	
	1972	1977	1977 (in 1972 dollars)*	Dollars	Percent Change
592. Liquor stores	\$215	\$282	\$173	\$-42	-20%
593. Used merchandise stores	14	25	15	1	10
594. Miscellaneous shopping goods stores	169	356	218	49	29
5941. Sport good stores, bicycle shops	55	110	67	12	23
5942. Book stores	11	32	20	9	78
5943. Stationery stores	7	24	15	8	110
5944. Jewelry stores	35	77	47	12	35
5945. Hobby, toy, game shops	8	15	9	1	15
5946. Camera, photography supply stores	8	16	10	2	23
5947. Gift, novelty, souvenir shops	14	39	24	10	71
5948. Luggage, leather goods stores	4	5	3	-1	-23
5949. Sewing, needlework, piece goods stores	29	37	23	-6	-22
596. Non-store retailers	408	461	283	-125	-31
5961. Mail order houses	315	338	207	-108	-34
5962. Automatic merchandising machine operators	47	71	44	-3	-7
598. Fuel and ice dealers	72	164	101	29	40
5992. Florists	28	39	24	-4	-15
5993. Cigar stores, stands	3	7	4	1	43
All retail trade in Minnesota	8,317	13,567	8,321	4	0

Source: U.S. Department of Commerce, Bureau of the Census, 1977 Census of Retail Trade, Geographic Area Analysis (Minnesota), Table 2.

Note: Establishments with payroll accounted for well over 90 percent of U.S. total retail sales, with the proportion rising 1972-1977.

\*1977 dollars converted to (estimated) 1972 dollars using factor of .6133, the ratio of 1972 and 1977 PPI's. See text.

larger share of women in the labor force contributed to increased sales in eating places and lower sales in food stores. A sharp slowdown in new house construction meant lower sales of furniture and home furnishings but higher sales for lumber and building materials dealers as people modified existing housing rather than moving. Income not spent on extra housing gets diverted in part to extra cars. Patterns of change in retailing mirror a society in constant transition culturally, demographically, and geographically.

#### Retail Trade Changes -- a Mirror of American Societal Changes

An example from the food retailing sector illustrates how societal change can produce severe impacts on a single industry. In the past couple of years some of the nation's biggest supermarket operators have been limping badly. Safeway Stores, the largest grocery chain, had a dollar sales increase of 8 percent in the first nine months of 1980, but its profits were down 28 percent. The Atlantic and Pacific Tea Company languished, even under new ownership: sales in the first three quarters of 1980 fell 4 percent and losses were \$42 million. Winn-Dixie Stores, strong and popular in the South, had a 7 percent decline in profits during the first three quarters of 1980 and surprised everyone in the industry. Sun Belt location, a non-union work force, little debt, and smart management could not rescue the situation for Winn-Dixie. The overall performance of this firm was typical of the industry's doldrums during the first three quarters of 1980:

- Safeway had \$10 billion in sales and profit of \$77 million from its 2,400 stores;
- Kroger had \$7.6 billion in sales and profit of \$77 million from 1,700 stores;
- A & P had \$5 billion in sales and a loss of \$42 million from its 1,500 stores; and

- Winn-Dixie had \$4 billion in sales and profit of \$64 million from 1,200 stores (the only major chain to make more than one cent per dollar of sales).

People are not eating less or paying less for food, but they are buying relatively less from conventional supermarket shelves, more from delicatessens, more in restaurants, and more in food specialty shops. The efficient, high volume, family-oriented suburban-type supermarket is showing the impact of the differences between the consumption patterns of the maturing Baby Boom generation and the patterns of the preceding generations. Shopping as a form of entertainment, self-expression, and personal gratification is replacing, for certain sectors of the population, the more straightforward idea of shopping as buying the week's groceries. Increased interaction with the clerk at the market means welcome personal attention for some customers. These customers feel the product is better because they value the experience of shopping and the sense of individualized selection. There is a cachet of status linked to the personal attention: the transaction costs more, but it is evidently worth significantly more. It provides a kind of indulgence that customers -- especially those living alone or in small households -- apparently feel is worth the extra price and extra time. Moreover, in times of recession, people often show their dislike of the pressure to economize by continuing to spend for certain luxuries. Thus, specialty shops selling top-of-the-line food items do a good business when "food as recreation" substitutes in part for other kinds of recreation.

The structure of the U.S. population, its income, tastes, and geographical distribution are different now from the pattern in the midst of the Baby Boom decades of the 1950s and 1960s. It is reasonable to expect changes in the retail grocery business to accompany these changes in society. This expecta-

tion is appropriate of other retail businesses as well. In fact, we note that the statistics presented throughout this report are only a glimpse of the whole picture and that their proper interpretation requires that a broader range of society's concerns and changes be kept in mind.

### Summary

The 1972-77 period that was the main focus of this report included some bleak years for the U.S. economy. The maladies of the national economy were in turn more or less reflected in each of the 50 states. During this period Minnesota fared as well as, and often better than, most other parts of the country according to the measures reported above. Admittedly, only a few aspects of the Minnesota economy have been probed here, but the aspects that were examined -- i.e., non-agricultural employment, manufacturing, wholesale trade, and retail trade -- are some of the most important ones in that they are basic to the maintenance and future well-being of any sophisticated economy.

We started our analysis with a brief look at change in Minnesota's non-agricultural employment between 1977 and 1980 and found that it expanded at a rate 2.1 percentage points faster than did U.S. non-agricultural employment. A "local performance effect" seemed mainly responsible for Minnesota's superior showing in this regard. That is, Minnesota's advantage over the nation as a whole in expansion of employment resided primarily in the successes of the state's industries as they competed against their rivals around the country, rather than in the state's specialization in certain industries. This finding applied to the earlier 1972-77 period as well.

Minnesota's performance in manufacturing was generally above average among states. This state ranked 10th among all states and the District of Columbia in terms of growth in real value added between 1972 and 1977. However, Minnesota did less well in terms of 1977 value added per production worker hour and in 1977 value added per employee (the state ranked 18th and 29th respectively, on these measures). In disaggregating Minnesota manufacturing into its individual 2-, 3-, and 4-digit SIC categories, we found that 25 of these industries had increases in real value added of more than 50 percent between 1972 and 1977 and that only 10 industries had declines of that magnitude.

Minnesota ranked 14th among states and the District of Columbia in 1977 wholesale trade volume. This was a reasonable performance, and there would seem to be opportunities for improvement, given the expansion of the market to the south and west of the state. Between 1972 and 1977 Minnesota exceeded the U.S. real growth rate in wholesale trade by 7 percentage points and ranked 16th in percentage growth. However, the state started off the period with a large base figure, and only six states ranked ahead of it in terms of absolute increase in volume. One reason for Minnesota's commendable performance in this sector was its improvement in productivity: during the 1972-77 period only 6 states ranked ahead of Minnesota in terms of percentage change in real sales per wholesale trade establishment, and only 5 ranked ahead of it in terms of percentage change in real sales per employee. If wholesale trade is broken down into its constituent SIC categories, we find that of Minnesota's 78 2-, 3-, and 4-digit wholesale industries, 49 gained, 28 lost, and one stayed the same in real sales during the period 1972-77.



The mid-1970s were generally depressed years for retail trade. Only 26 states, including Minnesota, had increases in real retail sales over the period 1972-77. Under these circumstances, improvements in productivity assumed considerable importance; still, on the measure of real sales per establishment, only Minnesota and 18 other states showed improvement over the period, and there were no improvements in terms of real sales per employee. When the Minnesota retail sector was broken down into SIC categories, we found that between 1972 and 1977 8 retail industries had improvements in real sales of \$25 million or more, which compared to 14 industries that had real losses of \$25 million or more.

There is a final caveat to this report. Throughout, we have equated economic well-being with output. This is consistent with the way that economic well-being is usually measured in today's advanced societies. There are, however, alternative ways of measuring economic well-being. For example, one could look at the Minnesota economy in terms of what is owned or controlled, or one could look at what is consumed. Consumption is, after all, the outcome towards which the production effort is geared. Additionally, a focus on production fosters neglect of certain "free economic goods" that do not pass through the market -- clean air, water, sunlight, forests, wildlife, and so forth -- despite their obvious importance to the workings of this society. We wish to point out that the adoption here of the production-oriented approach does not imply a discounting of such concerns or of the alternative approaches.

## Notes

This report was prepared for the Bureau of Business Research, School of Management, University of Minnesota, by John S. Adams, Professor of Geography and Public Affairs, University of Minnesota. Assisting were James D. Fitzsimmons, Julie M. Lange, Trevor J. Barnes, and Barbara J. VanDrasek, all of the Department of Geography, University of Minnesota.

Financial support for this work is provided by the Minnesota Business Partnership, the Minnesota AFL-CIO, and the University of Minnesota. Helpful comment and advice has been provided by many persons in Minnesota business, government, organized labor, and the university. Their interest and assistance are gratefully acknowledged. Errors of fact and interpretation, however, are the responsibility of the author.

The report is part of an ongoing project being carried out under the supervision of an advisory committee. Members of the advisory committee are:

Dale R. Olseth (Chairman), President and Chief Executive Officer, Medtronic, Inc., and Member of the Minnesota Business Partnership;  
Clyde Allen, Commissioner, Minnesota Department of Revenue;  
Wayne Burggraaff, Commissioner, Minnesota Department of Finance;  
David M. Lilly, Dean, School of Management, University of Minnesota;  
David Roe, President, Minnesota AFL-CIO; and  
Harry Sieben, Jr., Speaker, Minnesota House of Representatives.

For further information on this continuing project, contact John A. Cairns, Executive Director, Minnesota Business Partnership (612-370-0840), Edward J. Foster, Associate Dean, School of Management, University of

Minnesota (612-373-3759); or John S. Adams, Professor of Geography and Public Affairs, and Chair, Department of Geography, University of Minnesota (612-373-2661).