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# Staff Papers Series

Staff Paper P88- 5

March 1988

MINNESOTA ECONOMY TODAY AND HOW IT EVOLVED

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## MINNESOTA ECONOMY TODAY AND HOW IT EVOLVED

### SUMMARY

The Minnesota economy entered the 1980s with a recent history of unprecedented growth in jobs and income. Much of this growth is attributed to the export boom of the 1970s that opened new and expanding markets for Minnesota manufacturing, agriculture-related and services-producing industries.

What goes up, eventually comes down, which is exactly what happened with the export trade boom of the 1970s. Two recessions in the early 1980s, followed by a sharp reduction in export and domestic markets for Minnesota manufacturers, resulted in a corresponding decline in manufacturing industry employment--a decline significantly larger in both the Metropolitan Region and Greater Minnesota than the decline precipitated by the agricultural crisis of the early 1980s.

Minnesota's economic future is directly linked to its export-producing industries. Worldwide economic growth supported the large increases in Minnesota exports of agricultural and manufactured products to the rest of the world. These exports more than doubled in value from 1972 to 1977, exceeding the growth in Gross State Product.

Of particular importance to the Minnesota economy is the shift to services and the prospects for their improved productivity. An above-average sensitivity to the business cycle, however, is likely to dampen productivity increases insofar as a sharp decline in output is not accompanied by an equally sharp drop in employment.

Population growth is a key variable in differentiating the economic prospects facing individual Minnesota regions, with the geography of population growth being characterized by distinct categories of counties--the

persistent gainers, the persistent losers and the turnaround counties. The largest persistent gainers are counties within the daily commuting fields of the metropolitan area centers extending from St. Cloud to Rochester. If recent population trends were to continue with about half the counties gaining population and the rest--all rural--losing population, nearly three-fourths of Minnesota's total population in the year 2000 would reside within a daily commuting distance of the St. Cloud-to-Rochester axis.

Historically, Minnesota has lagged the US in population growth. In 1940, Minnesota's total population was 2.8 million or 2.1 percent of the US total of 132 million. By 1980, while total population increased to 4.1 million in Minnesota, it dropped to 1.8 percent of the US total.

Despite lagging population growth (or, possibly, because of it), the per capita income of Minnesotans increased from 12 percent below the US average in 1940 to two percent above the US average in 1980. In 1984, it reached \$13.5 thousand or nearly four percent above the US average of \$13 thousand.

The increase in per capita income is attributed to two central factors--the shift in basic employment from agriculture to manufacturing and the rapid increase in labor force participation, particularly female, which more than compensated for the lagging population growth. In addition, persons 16 years and older have become an increasingly larger part of the total population, which further increased the employment-population ratio.

Cyclical and structural changes in Minnesota industries are documented on this report--the third in series on education and the economy. This is followed by a review of the role of expanding exports and improved productivity in Minnesota's economic growth. Finally, the effects of changing employment, earnings, exports and productivity are discussed in the context of population and income trends and distributions in Minnesota substate regions.

## MINNESOTA ECONOMY TODAY AND HOW IT EVOLVED

Wilbur Maki

The past 25 years of growth and change in U.S. and world economies has meant tremendous shifts in Minnesota industry employment, the productivity of this employment, and the incomes it generates.

- o Minnesota nonfarm industry nearly doubled in employment in the period from 1959 to 1985 as nonfarm wage and salary jobs increased from 932 thousand to 1.9 million.
- o Nonfarm self-employed also grew from less than 100 thousand to more than 312 thousand.
- o Meanwhile, total farm jobs--full-time and part-time--dropped from more than 200 thousand to less than 135 thousand.

While the Minnesota economy expanded and diversified, it also became increasingly sensitive to the general business cycle. In the last two recessions, Minnesota nonagricultural wage and salary employment dropped 5.6 percent from its fourth quarter, 1979 peak of 1,787.1 thousand to its fourth quarter, 1982 trough of 1,686.4 thousand--as shown in Table 3.1. During the same period, U.S. employment dropped 1.2 percent--from 90.467 million to 88.693 million, or about one-fifth the percentage drop in Minnesota nonagricultural wage and salary employment.

### Industry Employment and Earnings

On an average annual basis, total nonagricultural wage and salary employment increased from 1479.4 thousand in 1975 to 1775.9 thousand in 1979 and 1903.8 thousand in 1987 with projected growth to 2052.3 in 1990. As shown in Figure 3.1, total employment tracked the general business cycle with the Minnesota share of total US employment increasing in the 1975-79 recovery and

Table 3.1

Minnesota nonagricultural wage and salary employment generally tracks the US business cycle with its troughs and peaks occurring within one quarter year or less of the corresponding US troughs and peaks but with varying rates of change. During the 1975-79 recovery period, for example, total employment increased from 1.5 million to 1.8 million--an annual rate of 4.8 percent. This rate was exceeded in the first two years of the recovery from the 1979-82 recessions, but not in subsequent periods.

Industry	Total Wage and Salary Employment										Annual Change			
	Otr. II		Otr. IV		Otr. IV		Otr. IV		Otr. II		Otr. IV		Otr. IV	
	1975	1979	1982	1984	1986	1987	1990	1975-79	1979-82	1982-84	1984-86	1986-87	1986-87	1986-90
	(thou.)	(thou.)	(thou.)	(thou.)	(thou.)	(thou.)	(thou.)	(pct.)	(pct.)	(pct.)	(pct.)	(pct.)	(pct.)	(pct.)
Mining	14.2	18.0	7.2	8.9	5.9	5.4	5.2	5.4	-26.2	11.0	-8.9	-2.7	-3.1	
Construction	59.7	83.7	58.1	69.6	75.9	81.8	80.0	7.8	-11.4	9.4	4.4	16.0	1.3	
Manufacturing, total	311.8	386.2	338.0	380.6	370.0	370.5	389.5	4.9	-4.3	6.1	-1.4	.3	1.3	
Manufacturing, nondurable	131.5	148.2	138.3	149.0	150.5	153.0	159.3	2.7	-2.3	3.8	.5	3.2	1.4	
Food products	47.8	49.1	46.1	45.3	45.1	45.8	46.4	.6	-2.1	.8	-3	3.2	.7	
Textiles & apparel	9.9	8.7	4.8	4.7	4.8	4.9	5.0	-2.7	-18.3	.4	.9	2.1	.7	
Paper and allied prod	30.4	33.7	31.8	33.5	32.8	33.2	33.6	2.3	-1.9	2.5	.9	2.3	.6	
Printing and publish	26.0	33.6	35.2	41.9	43.1	43.9	47.1	5.8	1.6	9.1	1.4	3.9	2.3	
Chemicals & petroleum	7.8	8.9	9.2	9.9	10.5	10.8	11.7	3.1	1.0	4.1	2.6	7.0	2.8	
Rubber & leather prod	9.7	14.2	11.2	13.7	14.2	14.3	15.5	8.9	-7.6	10.5	1.7	2.6	2.4	
Manufacturing, durables	180.3	237.9	199.7	231.5	219.5	217.5	230.2	6.4	-5.7	7.7	-2.6	-1.8	1.2	
Wood prod & furniture	12.1	16.4	12.9	17.1	19.4	20.3	21.3	7.0	-7.7	15.0	6.6	9.8	2.3	
Stone, clay & glass	8.5	9.9	8.3	8.4	7.9	8.1	8.3	3.3	-5.6	.8	-3.1	5.1	1.1	
Primary metal produc	5.4	7.5	5.2	6.4	6.3	6.3	6.8	7.3	-11.1	10.3	.7	.6	2.0	
Fabricated metal pro	31.6	39.6	32.6	34.8	33.7	33.6	34.2	5.2	-6.3	3.3	-1.6	.4	.4	
Nonelectrical machin	65.3	90.3	79.1	93.9	79.8	76.8	83.3	7.4	-4.3	9.0	-7.8	7.0	1.1	
Electrical machinery	21.8	28.4	24.6	28.8	26.2	27.1	29.1	6.0	-4.7	8.3	-4.6	7.0	2.7	
Transportation equip	10.3	10.4	5.1	7.4	8.8	8.9	9.2	.3	-21.4	20.8	9.4	1.8	1.0	
Instruments & miscel	25.7	35.5	31.9	34.8	37.4	36.3	38.0	7.4	-3.5	4.4	3.7	-5.7	.4	
Total commodity produci	385.7	487.8	403.3	459.1	451.8	457.7	474.7	5.4	-6.1	6.7	.8	2.6	1.2	
Trans., comm. & utilitie	88.9	100.9	92.4	97.4	97.2	97.7	102.0	2.8	-2.9	2.7	.1	1.2	1.2	
Trade, total	367.0	448.7	423.3	463.8	473.3	479.5	510.2	4.6	-1.9	4.7	1.0	2.6	1.9	
Wholesale trade	104.1	118.9	109.2	116.7	117.7	118.2	.0	3.0	-2.8	3.4	.4	1.0		
Retail, total	262.9	329.8	314.0	347.1	355.7	361.3	.0	5.2	-1.6	5.1	1.2	3.2		
Eating & drinking	75.6	105.8	104.5	118.3	119.7	120.6	.0	7.7	.4	6.4	.6	1.5		
Other retail trad	187.2	224.0	209.5	228.8	236.0	240.7	.0	4.1	-2.2	4.5	1.5	4.1		
Fin., ins., and real es	75.1	93.2	98.2	107.4	118.8	120.2	132.6	4.9	1.8	4.6	5.2	2.4	2.8	
Private services, total	275.0	360.0	382.1	425.1	453.0	464.9	519.1	6.2	2.0	5.5	3.2	5.3	3.5	
Business services	31.6	54.1	56.7	76.2	82.9	85.7	.0	12.6	1.6	16.0	4.3	6.8		
Health services	95.2	119.9	132.2	138.8	143.8	146.6	.0	5.3	3.3	2.5	1.8	3.9		
Other services	148.1	186.0	193.2	210.1	226.3	232.7	.0	5.2	1.3	4.3	3.8	5.7		
Government, total	268.7	296.5	287.1	297.3	312.6	314.2	330.0	2.2	-1.1	1.8	2.6	1.0	1.4	
Federal	31.5	31.3	30.7	31.2	32.9	32.8	34.2	-.2	-.6	.8	2.8	-1.0	1.0	
State & local, total	237.6	265.2	256.4	266.1	279.7	281.3	295.8	2.5	-1.1	1.9	2.5	1.2	1.4	
State	61.0	70.0	70.9	73.1	76.4	76.8	.0	3.1	.4	1.5	2.2	1.2		
Local	176.6	195.3	185.5	193.0	203.4	204.5	.0	2.3	-1.7	2.0	2.7	1.2		
Total noncomm. producin	1074.8	1299.2	1283.1	1390.9	1455.0	1476.6	1594.0	4.3	-.4	4.1	2.3	3.0	2.3	
Total industry employee	1460.5	1787.1	1686.4	1850.0	1906.8	1934.3	2074.9	4.6	-1.9	4.7	1.5	2.9	2.1	

decreasing in the 1979-82 recession and increasing for the 1982-85 position of the 1982-87 and projected 1987-90 recovery. However, the period since 1986 is characterized by a "flat" employment share of about 1.9 percent, as shown below:

<u>Year</u>	<u>Total Employment</u> (thousand)	<u>Increase from 1975</u> (thousand)	<u>Employment Share</u> (percent)
1975 (trough)	1479.4	0	1.93
1979 (peak)	1775.9	296.5	1.97
1982 (trough)	1734.2	254.8	1.93
1984 (recovery)	1837.2	357.8	1.94
1986 (recovery)	1903.8	424.4	1.90
1990 (recovery)	2052.3	572.9	1.90

Thus, the average employment increase per week ranged from 1425 in the 1975-79 period to 991 in the 1982-84 period, 634 in the 1984-86 period, and a projected 714 in the 1986-90 period.

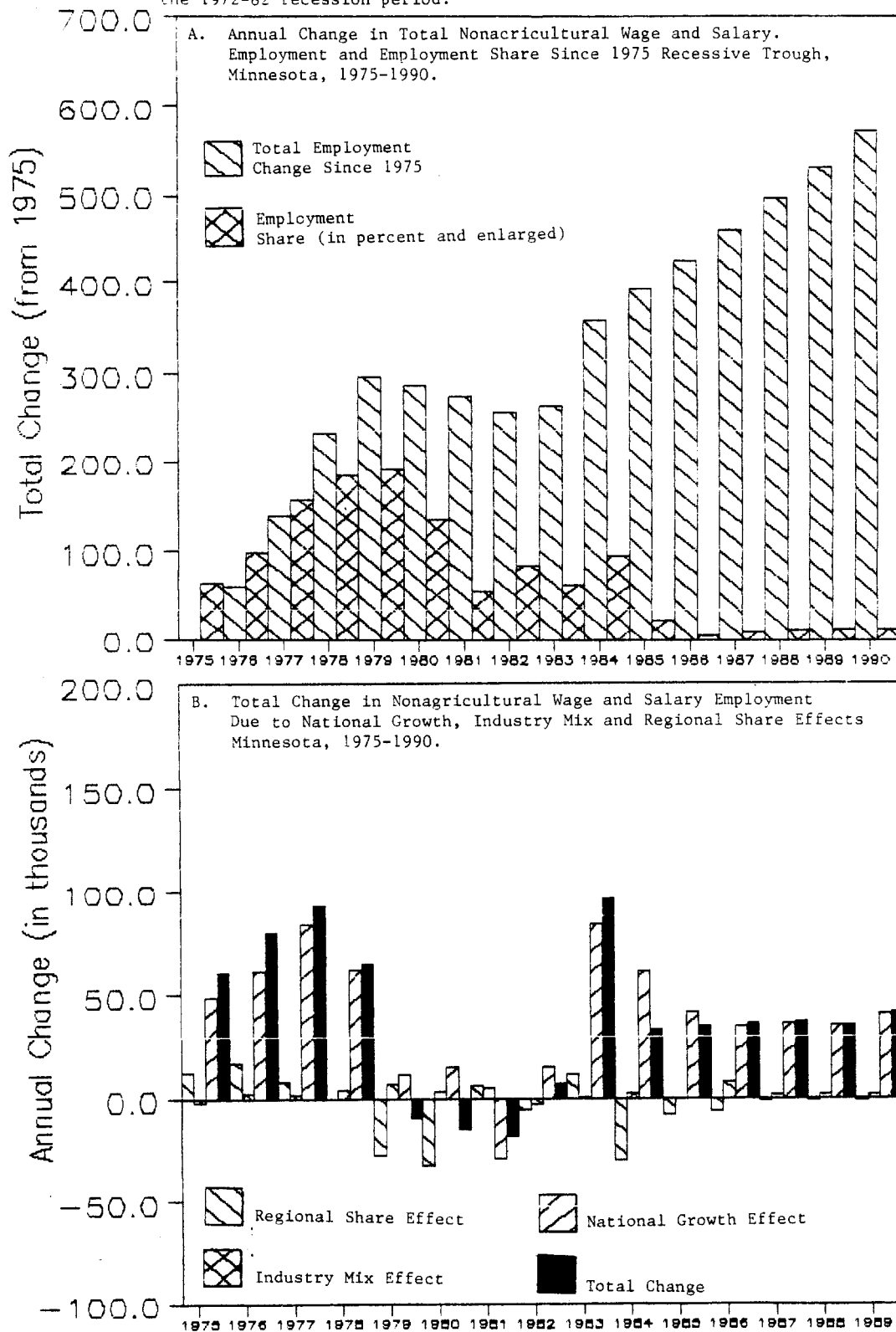
Using the shift-share method for determining sources of employment change, a breakdown for each of five periods is calculated as follows:

<u>Change Source</u>	<u>1975-79</u>	<u>1979-82</u>	<u>1982-84</u>	<u>1984-86</u>	<u>1986-90</u>
Regional share	37.4	-53.4	6.2	-37.2	-8.6
Industry mix	5.2	14.0	-2.0	2.1	12.1
Relative change	42.6	-39.4	4.2	-35.1	3.5
National growth	253.9	-2.4	98.9	101.7	145.0
Total change	296.5	-41.8	103.1	66.6	148.5

The largest source of change in Minnesota wage and salary employment in recovery has been the national-growth effect. Relative change was negative for both the 1979-82 recession and the 1984-86 recovery periods because of negative regional-share effects during the two periods. The competitive position of Minnesota industries declined relative to the corresponding US industries by 53.4 thousand in the 1979-82 period and 37.2 thousand jobs in the 1984-86 period. The overall regional-share effect remains negative for the projected 1986-90 period. The projected job increase exceeds the national

Figure 3.1

Total nonagricultural wage and salary employment grew by 460.3 thousand during the 1975-1987 period when the Minnesota employment share increased from 1.93 percent of US employment in 1975 to 1.98 percent in 1979 and then dropped to an even 1.9 percent by 1986. During the recovery period the national growth effect was the largest source of increases while the industry-mix effect accounted for much of the employment reductions in the 1972-82 recession period.



growth effect despite the negative regional-share effect because of an above-average industry-mix effect. The Minnesota economy is again characterized by an above-average concentration of the above-average growth industries and not because of the overall superior competitive position of Minnesota nonagricultural industries. Only in the 1978-79 period, when Minnesota manufacturing expanded sharply in the wake of a trade boom, was the regional-share effect in excess of 10 percent of the total employment change. As the US goes in aggregate industry growth, so goes Minnesota--for the most part.

Minnesota's durable goods manufacturing is no exception to the general rule of tracking closely US industry growth and decline, but with greater year-to-year fluctuations. Durable goods manufacturing has gradually increased in importance among Minnesota's basic, export-producing industries, both prior to the 1975 recession trough and after.

#### Cyclically-sensitive industry

Above-average growth in Minnesota's durable goods manufacturing industries is attributed to their unique competitive position in both domestic and world markets. The role of any industry in economic growth and change is affected by its export market orientation as well as its sensitivity to the general business cycle.

Export-producing industries--primarily manufacturing businesses, but including also, farming, mining, and services--are readily identified by the out-of-state destination of their product: They bring in the first dollar that circulates and re-circulates from one business to another before leaving the state.

To visualize and appreciate how Minnesota industries are affected by the

business cycle, we focus on four durable goods manufacturing industries--fabricated metals, computing and office equipment, other nonelectrical machinery, and scientific and controlling instruments (also, including miscellaneous manufacturing). Each of four industries has demonstrated above-average growth in the 1970s and the 1980s. Their strong competitive position in exports markets is illustrated by a generally positive regional-share effect, as shown in Figure 3.2 and Figure 3.3. Because of above-average sensitivity to the general business cycle and the foreign trade cycle, they also have experienced generally negative industry-mix effects. Among individual industry changes the regional-share and industry-mix effects account for a larger portion of total change in any one year than the national-growth effect. The year-to-year fluctuations in the industry-mix effect, particularly, accounts for most of the volatility of total employment change in durable goods manufacturing.

Total employment change attributed to each change source for the computing and other office equipment and other nonelectrical machinery industries are summarized as follows:

Change Source	1972- 75	1975- 79	1979- 82 (thousands)	1982- 84	1984- 86	1975- 87
Computing & Office Equip:						
Regional share	-0.7	-1.9	-0.8	2.6	-1.8	-3.8
Industrial mix	-1.6	5.6	6.8	2.5	-7.6	5.0
Relative change	0.9	3.7	-6.0	-0.1	-9.4	1.2
National Growth	1.0	4.5	-0.2	2.3	2.6	10.1
Total change	1.9	8.3	5.8	7.4	-6.7	11.3
Other Nonelectrical:						
Regional share	0.0	7.0	-3.0	3.9	-1.6	6.3
Industry mix	1.5	0.6	-7.4	-4.4	-4.5	-17.0
Relative change	1.5	7.6	-10.4	-0.5	-6.1	-10.7
National growth	1.4	6.6	-0.1	2.2	2.4	11.8
Total change	2.9	14.1	-10.4	1.8	-3.8	1.1

Contrasting patterns of employment change are apparent for these two durable goods industries. Most of recent growth of the computing and office equipment

Figure 3.2

Computing and office machinery manufacturing tracks the general business cycle with its negative industry-mix effect in recession troughs and generally positive regional-share effect (Part A). Other nonelectrical machinery manufacturing has experienced a negative industry-mix effect during much of the post-1975 recession trough (Part B). The regional-share effect, which depicts the competitive position of an industry in Minnesota, has been more negative than positive for computing and office machinery manufacturing and more positive than negative for other non-electrical machinery, thus indicating difficulties in maintaining competitive positions in the US economy for the first of the two industries.

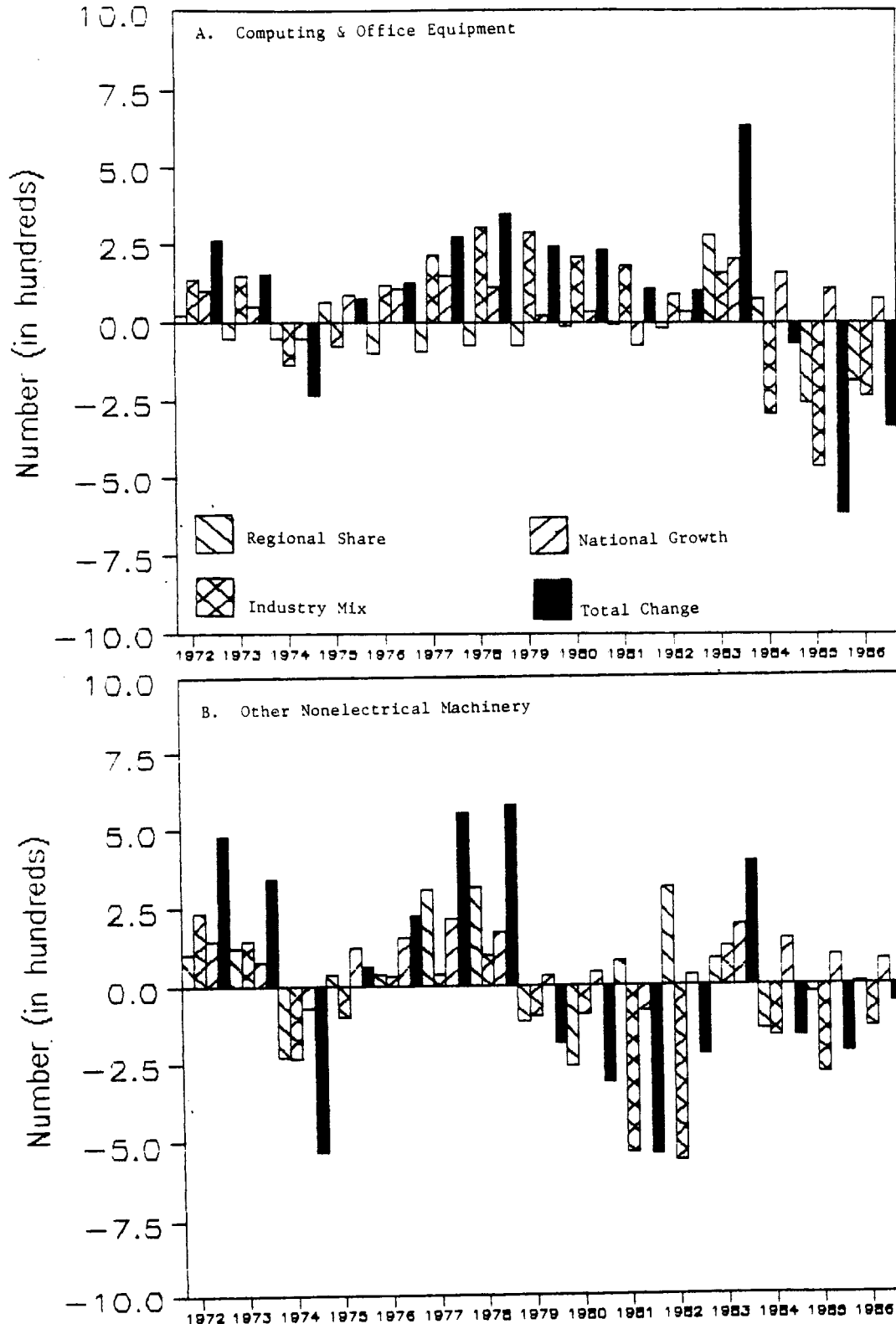
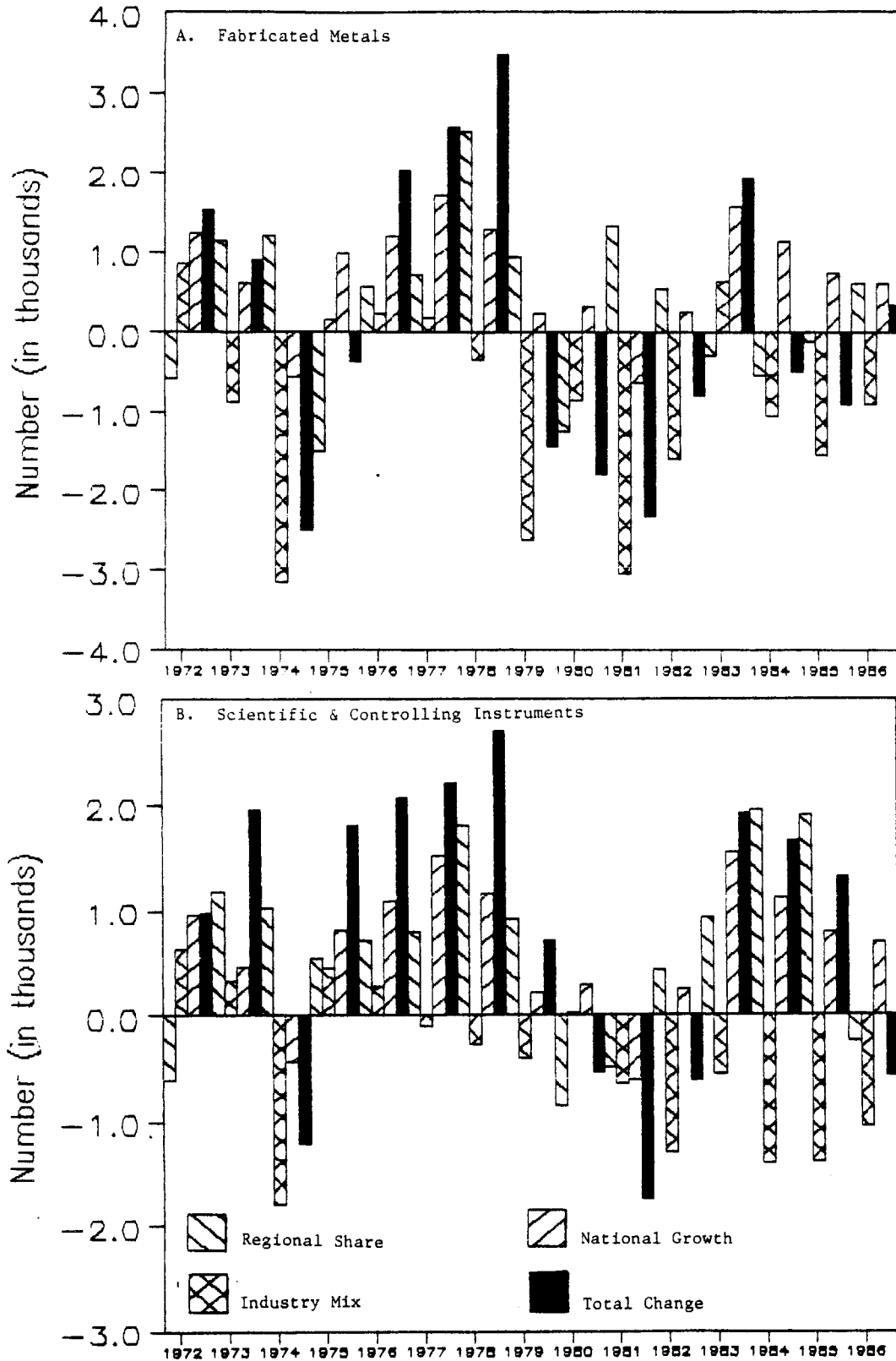


Figure 3.3

The fabricated metal products manufacturing industry in Minnesota experienced sharp fluctuations in its employment over the business cycle, with generally declining employment since 1979 (Part A). Scientific and controlling instruments (and miscellaneous) manufacturing in Minnesota also experienced above-average employment volatility (as represented simultaneously by a negative regional-share effect and a negative industry-mix), but with generally rising employment since 1979 (Part B).



industry has occurred since 1975 while other nonelectrical machinery grew more in the 1972-75 period than the 1975-87 period. A major portion of nonelectrical machinery manufacturing lagged its counterpart industries in the rest of nation.

Smaller year-to-year changes in total employment have occurred in the two other important export-producing industries of Minnesota--fabricated metals and scientific and controlling instruments--than in either of the two parts of the nonelectrical machinery manufacturing. Total employment change attributed to the three change sources (with relative change being the sum of regional share and industry mix) in the remaining two important export-producing industries is summarized as follows:

<u>Change Source</u>	<u>1972-75</u>	<u>1975-79</u>	<u>1979-82</u>	<u>1982-84</u>	<u>1984-86</u>	<u>1975-87</u>
Fabricated Metals:						
Regional share	1.8	2.3	1.0	0.3	-0.7	3.6
Industry mix	-3.2	0.2	-6.5	-0.9	-2.6	-10.7
Relative change	-1.4	2.5	-5.5	-0.6	-3.3	-7.1
National growth	1.3	5.2	-0.1	1.8	1.9	9.5
Total change	-0.1	7.7	-5.6	1.2	-1.4	2.4
Scientific & control instr. & misc.:						
Regional share	1.6	3.8	-0.4	1.4	3.9	8.4
Industry mix	-0.8	0.4	-1.0	-1.8	-2.8	-6.4
Relative change	0.8	3.4	-1.4	-0.4	1.1	2.6
National growth	1.0	4.6	-0.1	1.8	1.9	8.8
Total change	1.7	8.8	-1.6	1.3	3.0	10.9

Total employment growth in fabricated metals lagged national growth in the 1975-87 period while it led national growth in scientific and controlling instruments.

In total, the durable goods manufacturing industries lagged national growth as shown by the relative change effect of -14.6 thousand jobs. These four industries, which accounted for 160.4 thousand total wage and salary employment at the peak of the 1975-79 recovery, have lost employment share

since 1979. Each of the four industries experienced lagging growth at the US level, too, as a result of the collapse of US foreign markets and foreign penetration of domestic markets during much of the 1980s.

Total employment change in the 1972-87 period for the entire group of four durable goods manufacturing industries as shown in Part A, Figure 3.4 is summarized as follows:

<u>Change Source</u>	<u>1972-75</u>	<u>1975-79</u>	<u>1979-82</u>	<u>1982-84</u>	<u>1984-86</u>	<u>1975-86</u>
		(thousand)				
Regional change	2.6	11.2	-3.2	8.1	-0.2	14.6
Industry mix	-0.9	6.8	-8.1	-4.7	-17.5	-29.6
Relative change	1.7	17.0	-11.3	3.4	-17.7	-14.5
National growth	4.8	20.8	-0.5	8.2	8.8	40.1
Total change	6.4	38.9	-11.8	11.6	-8.5	25.6

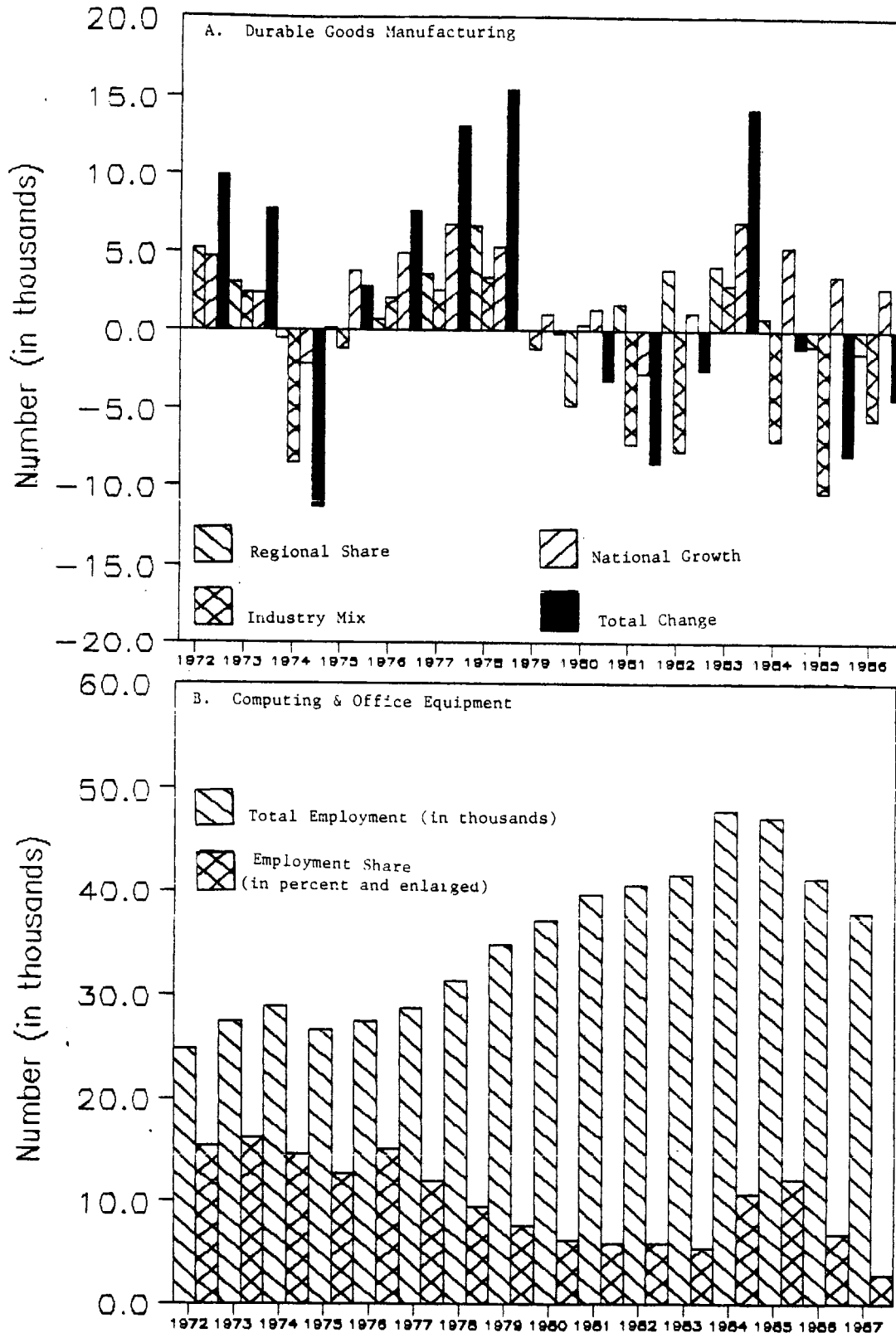
For this group of industries, total employment has declined since the 1975-79 recovery, with the largest decline occurring during the 1979-82 recession and again in the 1984-86 period when recovery from the recession was eroded because of the loss of foreign and domestic markets.

The job-reducing consequences of negative industry-mix and regional-share effects are represented by an erosion of increases in Minnesota industry employment and employment share. The computing and office equipment is represented as one of the fast-growing industries that now showed growing difficulties in maintaining share (Part B, Figure 3.41). It led Minnesota's manufacturing industry growth in the 1960s. The business services industry now leads Minnesota's growth in large services industry sector, while health care services led it in the 1970's. Each industry has played a special role in the growth and development of the Minnesota economy and each industry is, in varying degree, cyclically sensitive.

Computing and other office equipment industry grew rapidly in its early years in Minnesota. By 1972 it accounted for nearly 10 percent of the U.S. computer and office equipment industry employment share, but it declined in

Figure 3.4

Total employment change in the four durable goods manufacturing industries--computing and office equipment, nonelectrical machinery, fabricated metals, and scientific and controlling instruments (and miscellaneous) was positive in the 1972-79 period and negative in the 1979-87 period largely as a result of large negative industry-mix effects that were accentuated by smaller, but significant, negative regional-share effects (Part A). During this period the computing and office equipment manufacturing which is representative of the growth industries in durable goods manufacturing, increased in total employment in most years, but declined in market share (Part B).



market share in the remainder of the decade. This industry changed course intermittently in the 1980's. Despite the job-reducing impacts of the 1980 and 1981-82 recessions on durable goods manufacturing, the computing and other office equipment manufacturing in Minnesota industry actually increased in wage and salary employment from 38 thousand in late 1979 to 42 thousand in early 1982 and only then dropped to 40 thousand before increasing sharply to its 1984 peak of 50 thousand jobs.

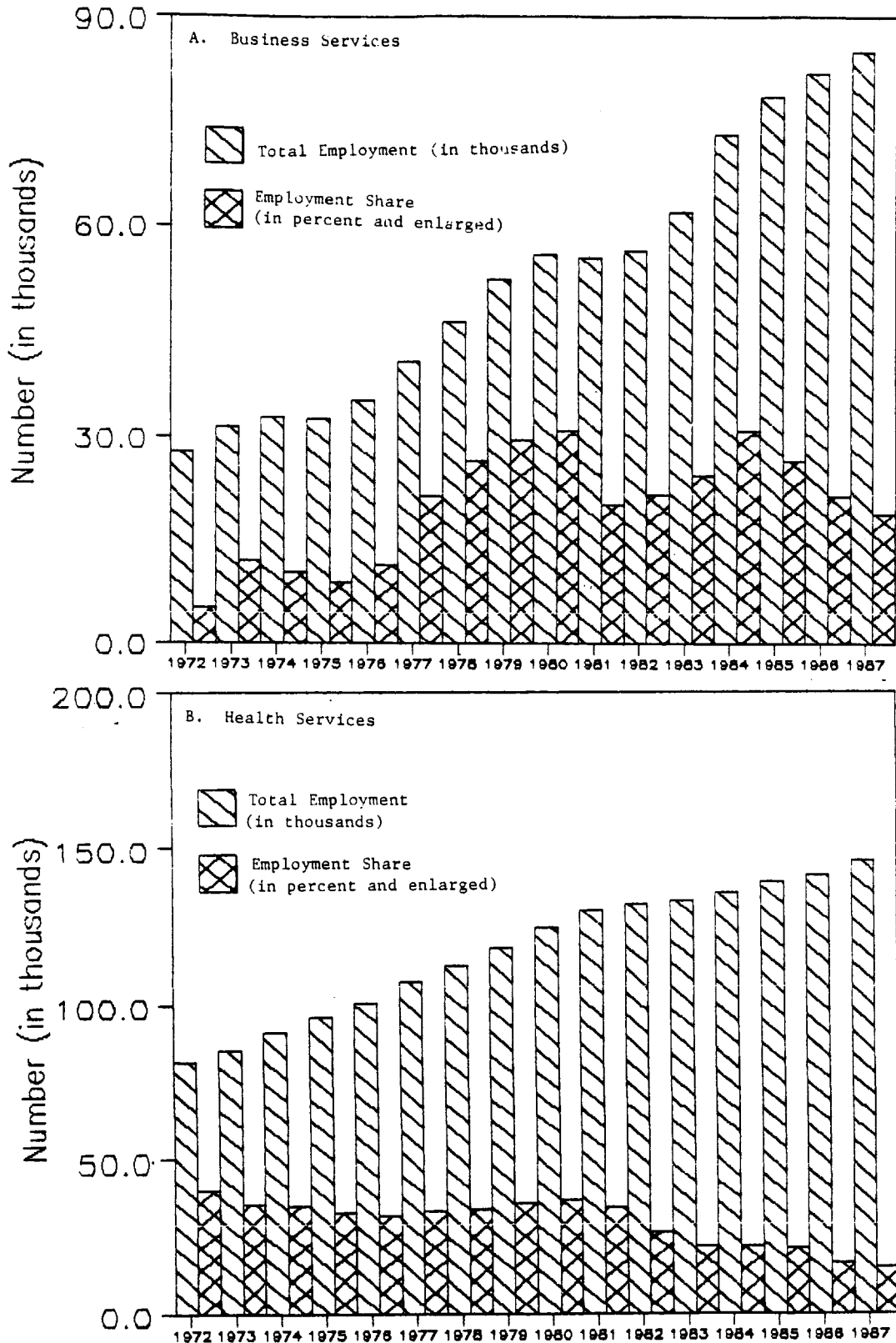
In spite of recession, the Minnesota computing and other office equipment industry was expanding its share of total U.S. employment in this industry from a 15-year low of 8.4 percent in 1982 to 9.5 percent in 1984. It had declined from its historical peak share of 9.7 percent in early 1973 even though it was increasing in total employment. This occurred because of its rapid, above-average growth in the rest of the nation.

The business services industry is another rapidly expanding, and now an increasingly important, export-producing industry. Total wage and salary employment grew from 31 thousand, or 1.6 percent of total U.S. employment in this industry in 1972, to nearly 79 thousand or 1.9 percent of the U.S. employment in late 1984, as shown in Part A, Figure 3.5. This Minnesota growth industry also escaped the 1980-82 recessions with only a slight drop in total employment and U.S. employment share. Business services is a new growth industry that is strongly linked to all of Minnesota's technology-intensive manufacturing.

The health services industry is a third Minnesota growth industry that is also export-producing insofar as it attracts patients, clients, and customers from outside the state. Until recently it was the slowest-growing of the three and like the computing equipment industry, it, also, lost in its share of total U.S. employment. It dropped from 2.4 percent of U.S. employment in mid-1983 to

Figure 3.5

Business services (Part A) and health care services (Part B) experienced rapid growth in total employment throughout the 1970s and 1980s. Employment share, however, generally increased for business service and generally declined for health care services, thus showing the contrasting competitive position of the two service industries in the Minnesota economy and, also, in the case of health care, the employment-reducing effects of industry restructuring following gradual deregulation.



2.2 percent of U. S. employment in mid-1983, as shown in Part B, Figure 3.5.

Total wage and salary employment increased, meanwhile, from 86 thousand to 134 thousand.

Employment growth in the health services industry now lags its earlier growth rates because of industry de-regulation and cost-reducing pressures asserted by both private and public employers. Large reductions in hospital employment since 1981 account for much of the recent quarterly volatility in total wage and salary employment in this industry. Moreover, the rate of growth in the already above-average health care expenditures of Minnesotans in the 1970s is being gradually reduced as both employers and governmental oversight groups monitor and contain out-of-control health care costs.

Total employment in the health services industry is much larger than the wage and salary employment reported here when the self-employed and government employees are correctly included in health services. Much controversy arises, of course, from employment comparisons based on different data sources. For example, 168 thousand employed persons reported the health services industry as their principal source of job remuneration for the 1980 U.S. Census of Population. In comparison, the 124 thousand full-time and part-time private wage and salary jobs are reported in the U. S. Department of Commerce Regional Economic Information System for 1980. However, these estimates do not include the self-employed and those on government payrolls who are nonetheless part of the health services industry as reported by the U.S. Bureau of the Census.

#### Structurally-changing industry

By taking out the short-term effects of cyclical change in industry employment, the underlying long-term shifts in Minnesota industry performance can be observed and measured. A first step is comparison of total persons employed at 10-year intervals, as reported by the U.S. Bureau of the Census and

summarized in Table 3.1. This is the first of two employment series that shows Minnesota employment trends since 1950. This series assigns each person to the industry that provides the principal source of remuneration. It covers the period from 1950 to 1980.

The second series is presented by the Regional Measurements Division of the U.S. Department of Commerce in its Regional Economic Information System (REIS) in the reporting of total jobs by industry. It includes the employment of both wage and salary and self-employed workers, unlike the "covered" (by federal-state unemployment insurance programs) employment series reported monthly by the Minnesota Department of Jobs and Training.

The two employment series are compared for the 1980 calendar year in Table 3.2. Differences between the two series exists. They differ in two principal reasons, namely, multiple job holdings and commuting. The job count series includes the one or more jobs held by one employed person. The person count series shows employment by place of residence, which yeilds, therefore, lower person count estimates than job count estimates for urbanized areas that are place-of-work destinations of rural residents.

For these two reasons (and, also, because of differences in industry classification procedures), the two series differ by an excess of 303.4 thousand jobs over employed persons in 1980. The services producing industries account for 83 percent of the difference. Among goods-producing industries, agriculture accounts for the largest difference.

The two series also show differences in excess industry employment, that is, the employment in excess of the US percentage distribution of total employment. In reporting their principal source of income from employment in goods-producing industries increased from 534 thousand in 1950 to 606 thousand in 1980 -- a 0.4 percent increase annually. At the same time, the total number

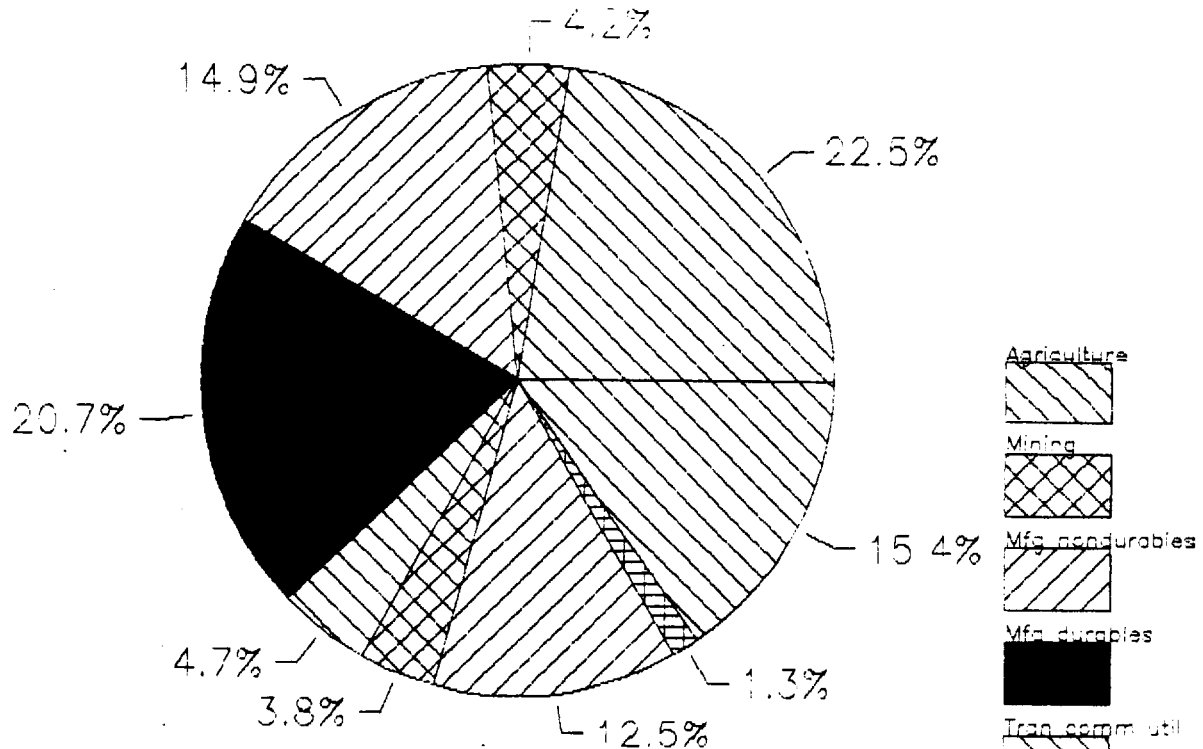
Table 3.2

Because of multiple job holding, the number of jobs exceeds the number of employed persons. In 1980, this difference amounted to 16 percent of both total and basic employment. The largest differences occur among services-producing industries, particularly retail trade and personal, business and repair services.

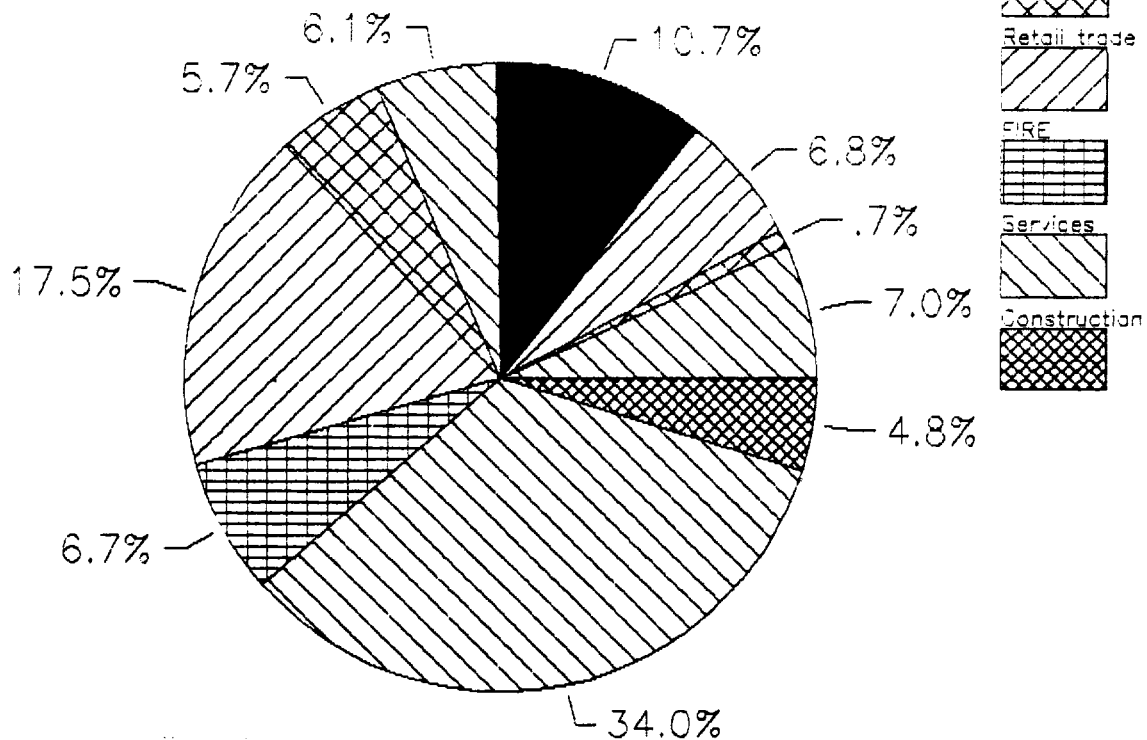
No. Industry	Total Employment		Basic Employment				
	Person Count	Adjust-ment	Job Count	Total		Proportion	
				Person Count	Job Count	Person Count	Job Count
	(thou.)	(thou.)	(thou.)	(thou.)	(thou.)	(pct.)	(pct.)
1 Agr. serv., for., fish.	110.6	41.9	152.5	55.4	63.1	22.8	22.5
2 Mining	15.2	1.1	16.3	11.5	11.8	4.7	4.2
3 Construction	99.4	5.6	105.0	.0	.0	.0	.0
Mfg., nondurable goods	131.7	16.7	148.4	35.9	41.9	14.8	14.9
4 Food products	46.0	2.9	48.9	16.4	14.8	6.8	5.3
5 Printing and publishin	36.5	- .6	35.9	6.9	9.3	2.8	3.3
6 Other nondurables	49.2	50.3	99.5	12.6	27.2	5.2	9.7
Mfg., durable goods	249.1	-14.6	234.5	58.2	57.9	24.0	20.7
7 Lumber and furniture	15.9	3.1	19.0	.0	.0	.0	.0
8 Fabricated metals	33.4	4.7	38.1	5.9	5.8	2.4	2.1
9 Nonelectrical machiner	91.5	-2.9	88.6	38.1	38.6	15.7	13.8
10 Electrical machinery	40.7	-13.6	27.1	.0	.0	.0	.0
11 Other durables	67.6	-5.8	61.8	14.2	13.5	5.9	4.8
Total goods producing	606.0	50.7	656.7	161.0	174.7	66.4	62.3
12 Trans., comm., utilities	129.1	4.1	133.2	6.7	13.2	2.8	4.7
13 Wholesale trade	92.2	32.5	124.7	10.8	10.7	4.5	3.8
14 Retail trade	321.2	62.9	384.1	20.8	35.0	8.6	12.5
15 Fin., ins., real estate	107.7	39.4	147.1	.0	3.6	.0	1.3
Services, total	629.4	113.8	743.2	41.3	43.1	17.0	15.4
16 Pers., bus., repair	141.6	73.2	214.8	.0	3.0	.0	1.1
17 Professional services	418.2	42.1	460.3	41.3	40.1	17.0	14.3
Health care services	168.3	-2.3	166.0	28.3	23.5	11.7	8.4
Educational services	170.0	-2.1	167.9	8.3	.0	3.4	.0
Soc. serv., nonprofit	47.6	31.1	78.7	6.7	16.6	2.8	5.9
Legal, other professio	32.3	15.4	47.7	.0	.0	.0	.0
18 Public administration	69.6	-1.5	68.1	.0	.0	.0	.0
Total services producing	1279.6	252.7	1532.3	79.6	105.6	32.8	37.7
All industry	1885.6	303.4	2189.0	242.6	280.3	100.0	100.0

Figure 3.6

Basic industry employment produces goods and services for out-of-state markets and buyers to bring in outside dollars that circulate and recirculate among Minnesota residents as an economic base "multiplier". In 1980, manufacturing and agriculture together accounted for nearly 60 percent of the economic base (Part A), but less than 25 percent of total employment (Part B), thus reversing the importance of the two major industry groups as determinants of Minnesota's economic well-being.



A. Basic Employment



B. Total Employment

of persons reporting their principal source of remuneration from employment in services-producing industries increased from 610 thousand to 1,280 thousand -- a 2.5 percent increase annually. Thus, the rate of growth in services-producing employment was more than eight times the rate of growth in goods-producing employment -- a dramatic indication of the massive shifts in Minnesota economy from producing goods to producing services. During this period, Minnesota's economic base also changed dramatically as the services-producing industries increased their importance as export-producing industries.

Comparison of the Minnesota's economic base of 1950 with its projected 1990 economic base shows the extreme importance of the manufacturing sector as a continuing source of new jobs to replace job losses in agriculture and mining. In 1980, for example, estimated exporting-producing, basic employment, was 242.6 thousand for the person count and 280.3 thousand based for the job count. The employment totals, as well as their percentage distribution among industries thus differ for the reasons cited earlier. Large individual industry differences occur in agriculture, retail trade, and social services. Educational services are underestimated with the job count series because of greater industry aggregation in the one series than the other.

The individual industry contribution to total basic employment is illustrated for the job count series in Part A of Figure 3.6. In 1980, agriculture accounted for 22.5 percent of total basic employment while the two manufacturing sectors accounted for 35.6 percent. Manufacturing and services together accounted for 51 percent of the total. In comparison agriculture and manufacturing accounted for only 7.0 percent and 17.5 percent, respectively of total employment (that is, basic and residentiary), while personal, business and professional service industries, together, with retail trade, accounted for

50.9 percent of the total, as shown in Part B of Figure 3.6. The goods-producing industries thus account for a major portion of basic employment, even when using the job count series.

The percentage distribution of both basic and total employment is changing continuously as a result of the business cycle and, also, long-term structural changes in the US economy. In 1950, agricultural employment represented nearly two-thirds, of total export-producing employment, as shown in Part A of Figure 3.7, while manufacturing and services, respectively, accounted for only 9.2 percent and 8.2 percent of the total. By 1990, as shown in Part B of Figure 3.7, agriculture is projected at 17.4 percent of the total while the services industry is projected at 16.6 percent and manufacturing is projected at 44 percent of the total--a near reversal, of the 1950 economic base with manufacturing and services together accounting for more than 60 percent of basic industry.

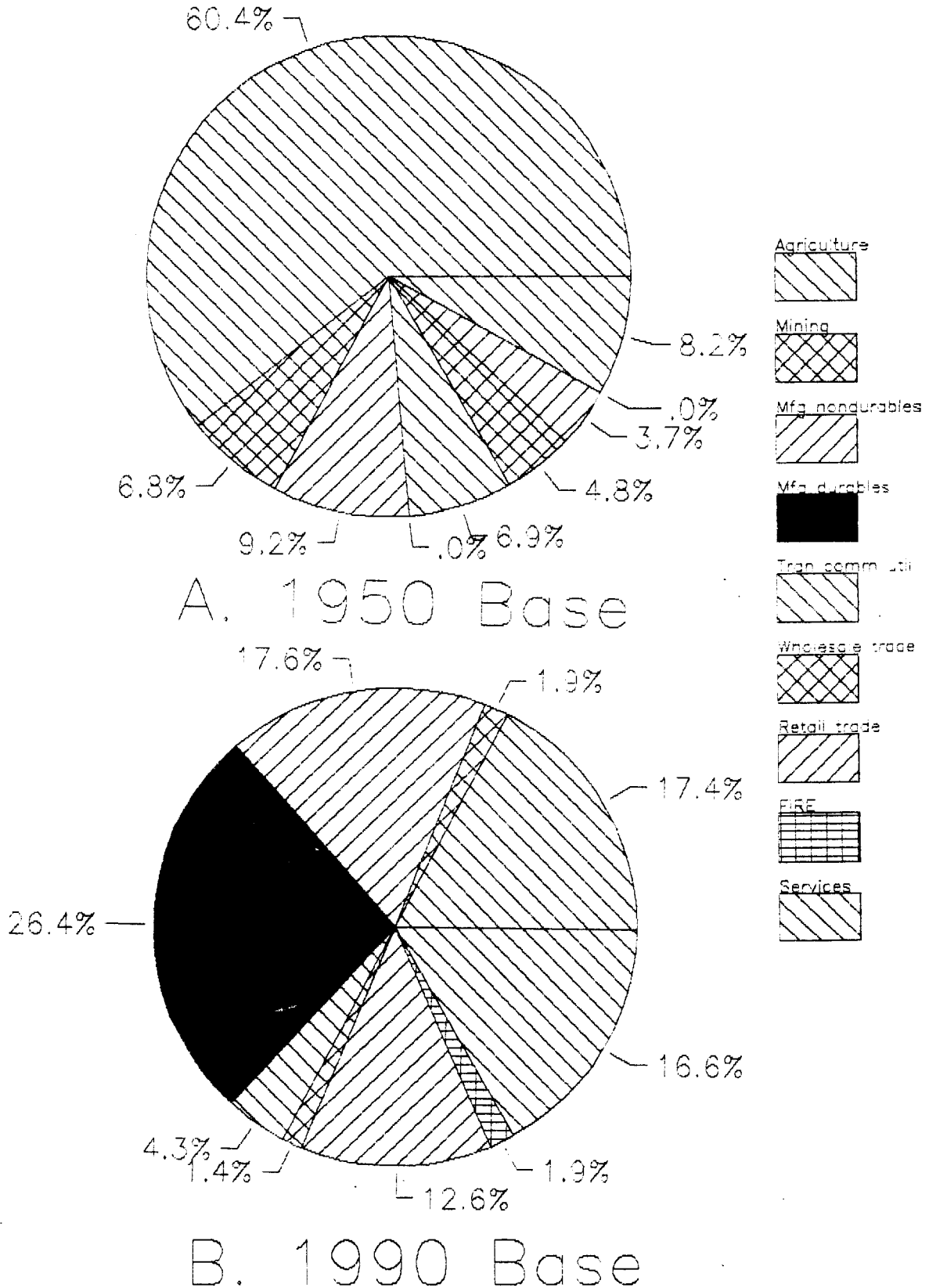
The percentage distributions of basic and total employment for 1950, 1980 and 1990 show the changing industry structure--both the shift to services in total employment and the shift to manufacturing in basic employment, as follows:

<u>Industry</u>	<u>Basic Jobs</u>			<u>1980 Comparisons</u>	
	<u>1950</u>	<u>1990</u>		<u>Basic</u>	<u>Total</u>
			(percent)		
Agriculture	60.4	17.4		22.5	7.0
Mining	6.8	1.9		4.2	0.7
Mfg., nondurables	9.2	17.6		14.9	6.8
Mfg., durables	0	26.4		20.7	10.7
Tran., comm. utilities	6.9	4.3		4.7	6.1
Wholesale trade	4.8	1.4		3.8	5.7
Retail trade	3.7	12.6		12.5	17.5
Fon., ins., real estate	0	1.9		1.3	6.7
Services	8.2	16.6		15.4	34.0
Construction	0	0		0	4.8
Total	100.0	100.0		100.0	100.0

Only construction among the major industry groups is entirely a residentiary, or nonbasic, activity. In 1950, however, durable goods manufacturing and

Figure 3.7

The transformation of Minnesota's economic base from two-thirds agricultural to two-thirds manufacturing and service has occurred since 1950. Except for iron ore mining and tourism, agriculture and agriculture-related manufacturing, trade and service industries were Minnesota's highly specialized economic base in 1950 (Part A). By 1990, manufacturing and service industries, with no relation to agriculture, will have emerged as Minnesota's new and diversified economic base, reversing the role of nonagricultural industry and establishing new entrepreneurial opportunities in Minnesota's economic future.



finance, insurance and real estate also were wholly residentiary industries. Basic jobs in these industries were virtually non-existent, as shown in Table 3.3

Another critical change in Minnesota's economic well-being is the remarkable diversity of its economic base. In 1950, agriculture, by accounting for two-thirds of its economic base, had no contenders as Minnesota's basic industry. Indeed, much of the basic manufacturing, trade and service industries was agriculture-related. Nondurable goods manufacturing was virtually non-existent in Minnesota as a basic industry. Yet, in less than three decades, the Minnesota economy was transformed into a post-industrial technology-intensive, manufacturing and service economy with remarkable capacity for self-sustaining economic growth.

Minnesota's economic geography also changed during the 1950-80 period from place specialization to place diversity. The Minneapolis-St. Paul area expanded from a trade and service center for a goods-producing hinterland to manufacturing, and professional and business services center catering to world markets. At the same time, agriculture-dependent rural counties experienced the effects of industrial overspill from the metropolitan centers. As a result of rural industrialization, less than two dozen Minnesota counties have more than two-thirds of their economic base in agriculture.

Industry diversification has heightened rather than reduced cyclical fluctuations in the Minnesota economy. Minnesota export-producing industries quickly transmit changes in general economic conditions to local suppliers and work force. Industry diversification, on the other hand, has lessened the state's vulnerability to structural change by providing existing industries a broad range of opportunities for entering new markets and acquiring new products and production techniques.

Table 3.3

Total employment persons in Minnesota's basic industries increased from 185.8 thousand in 1950 to 204 thousand in 1980--an annual growth rate of 0.3 percent over the 30-year period. For the 1980-90 period, using a job count of employment, total basic jobs increased from 280.3 thousand to 310.3 thousand--an annual growth, rate of 1.0 percent. The lower rate of increase for the 1950-80 period is the result of the increasing diversification of the Minnesota which reduced dollar leakage due to imports and increased the economic base multiplier--the relationship between total employment and basic employment.

No. Industry	Employment (persons)				Employment (jobs)			
	1950	1960	1970	1980	1980	1982	1985	1990
	(thou.)	(thou.)	(thou.)	(thou.)	(thou.)	(thou.)	(thou.)	(thou.)
1 Agr. serv., for., fish.	120.5	97.1	59.7	55.4	63.1	62.5	67.5	53.9
2 Mining	.0	5.0	1.9	.0	11.3	7.4	5.4	5.8
3 Construction	.0	.0	.0	.0	.0	.0	.0	.0
Mfg., nondurable goods	18.4	26.6	23.9	23.3	41.9	44.3	49.7	54.5
4 Food products	17.7	23.3	19.0	16.3	14.8	14.7	13.3	12.8
5 Printing and publishin	.7	3.3	4.9	7.0	9.3	11.2	16.0	20.2
6 Other nondurables	.0	.0	.0	.0	27.2	29.7	36.5	41.7
Mfg., durable goods	.0	13.6	32.6	51.3	57.9	57.1	71.3	81.8
7 Lumber and furniture	.0	.0	.0	.0	.0	.0	.0	.6
8 Fabricated metals	.0	.0	.0	5.9	5.8	6.2	7.7	9.4
9 Nonelectrical machiner	.0	.3	25.1	38.0	38.6	38.6	48.2	54.2
10 Electrical machinery	.0	.0	.0	.0	.0	.0	.0	.0
11 Other durables	.0	13.3	7.5	7.4	13.5	12.3	15.4	17.7
Total goods producing	138.9	142.3	118.0	130.1	174.7	171.3	194.0	196.0
12 Trans., comm., utilities	13.7	12.3	7.8	6.7	13.2	13.1	11.4	13.3
13 Wholesale trade	9.6	9.3	10.2	10.8	10.7	8.3	2.2	4.4
14 Retail trade	7.4	8.1	19.5	20.8	35.0	35.2	27.5	39.2
15 Fin., ins., real estate	.0	.0	.0	.0	3.6	5.4	9.2	5.9
Services, total	16.3	20.7	34.2	35.6	43.1	40.7	45.4	47.3
16 Pers., bus., repair	4.5	.0	2.1	.0	3.0	4.6	9.6	14.0
17 Professional services	11.8	20.7	32.1	35.6	40.1	40.3	36.1	37.4
18 Public administration	.0	.0	.0	.0	.0	.0	.0	.0
Total services producing	46.9	50.9	71.6	73.9	105.6	106.9	97.0	114.3
All industry	185.8	193.2	189.6	204.0	280.3	278.2	291.0	310.3

### Exports, Productivity and Economic Growth

Minnesota's economic growth is directly linked to its economic base and the growth of trade, imports as well as exports. Much attention is focused on the role of exports--the sale of Minnesota-produced goods and services to out-of-state customers--the source of Minnesota's economic growth. Much less attention is placed on role of imports in accounting for this growth. Without imports, of course, much value added by Minnesota businesses would not be possible. Minnesota, in short, is a trading economy, highly dependent on both imports and exports and highly sensitive to the economic well-being of its trading partners.

Worldwide economic growth in 1970s supported large increases in Minnesota exports of agricultural and manufactured products to the rest of the world. These exports more than doubled in value from 1972 to 1977, with the largest increases being in wheat and its products and nonelectrical machinery.

Although the worldwide economic downturn in the early 1980's dampened U.S. export growth, large gains still occurred in feedgrains and soybeans and, also, food products. Food and feed products on the one hand and capital goods on the other thus accounted for much, if not all, of the growth in Minnesota's export trade in the 1972-82 period. Until recently, however, net exports generally have declined, which, because of import expansion, was coupled with reduced access to rest-of-nation markets.

The bottom line of all effective and meaningful economic development is improved productivity of all employed resources rather than simply export expansion. Such results are best demonstrated in U.S. industry output and employment trends.

Increasing world-scale competition has forced goods-producing industries to move quickly to adopt cost-reducing measures, while residentiary

services-producing industries are protected from much outside competition by high transportation costs and the advantages of close proximity to their customers. Minnesota industry remains competitive in large part because of the productivity of its work force that is sustained at high levels by early adoption of cost-reducing technology and business services.

Comparison of output per worker in goods-producing and services-producing industries shows an early narrowing, but a more recent widening, of the differences between the two sectors in, the U.S. industry, as illustrated below:

	Goods-Producing		Services-Producing		All Industry	
	<u>1967-80</u>	<u>1980-84</u>	<u>1967-80</u>	<u>1980-84</u>	<u>1967-80</u>	<u>1980-84</u>
			(Percent)			
Output per Worker	1.0	3.0	1.0	1.2	0.6	1.5
Output	1.7	2.2	3.9	3.7	2.7	2.9
Employment	0.6	-0.8	2.9	2.5	2.1	1.4

Over the 1967-80 period output per worker in U.S. industry grew at an overall rate of one-percent annually in both goods producing and services-producing industries. In the 1980-84 period, however, output per worker increased 3.0 percent and 1.2 percent, respectively, in the two industries. The all industry growth was 0.6 percent and 1.5 percent, respectively, for the two periods.

The aggregate output per worker ratios mask important changes in both industry mix and total hours worked. A major industry breakdown of goods-producing and services-producing industries in the U.S. is again used in changes in individual industry output per hour ratios over the 1958-84 period, as follows:

	<u>1958-79</u>	<u>1979-82</u> (percent)	<u>1982-84</u>
Goods Producing:			
1 Agriculture	3.8	0.0	6.6
2 Nonagricultural total (incl. services)	1.7	-0.7	3.1
3 Mining	1.3	-1.3	6.3
4 Construction	0.0	-1.6	6.6
5 Manufacturing, total	2.2	-1.2	7.4
6 Mfg., durables	2.2	-1.2	7.4
7 Mfg., nondurables	2.9	0.6	3.3
Services Producing:			
8 Tran., comm., utilities, total	2.8	0.5	2.9
9 Transportation	2.3	-0.7	1.5
10 Communications	4.5	2.6	5.8
11 Public Utilities	2.2	-3.0	3.5
12 Trade, total	2.1	-0.3	3.8
13 Wholesale trade	2.2	-0.5	6.5
14 Eating & drinking places	-0.2	-0.5	0.4
15 Other retail	2.8	0.0	3.0
16 Finance, insurance & real est.	1.4	1.1	0.5
17 Other services	1.5	-0.5	0.8
18 Government enterprise	1.0	2.1	-0.4

More detailed data generally show higher output per hour ratios than the aggregate data because of large reductions in the hours worked per person. The shift to a shorter work week is obscured when reporting on a per worker rather than a per hour basis. The data also show large differences in output per worker trends and year-to-year fluctuations in output per hour ratios among the major industry groups.

A further breakdown of manufacturing industry in the U.S. is used to show output per hour ratios for 8 nondurable goods and 10 durable goods manufacturing industries, as follows:

	<u>1958-79</u>	<u>1979-82</u> (percent)	<u>1982-84</u>
Nondurable Manufacturing:			
Food products	2.5	3.5	3.9
Textile mill products	3.2	2.7	3.2
Apparel and other textile products	2.2	2.3	2.4
Paper and allied products	2.8	1.5	4.6
Printing and publishing	1.5	0.0	8.1
Chemicals and products	3.3	-3.2	8.1
Rubber and miscellaneous plastic products	1.0	1.8	5.1
Leather	1.2	3.3	4.2

Durable Manufacturing:

Lumber and wood products	3.2	6.5	6.9
Furniture and fixtures	2.3	2.8	2.9
Stone, clay and glass	1.7	-0.3	5.2
Primary metals	1.8	-3.3	5.2
Fabricated metals products	1.4	-1.2	5.4
Machinery, except electrical	2.4	-0.3	8.3
Electric and electronic equipment	3.7	1.9	6.6
Transportation equipment	2.4	-4.1	8.2
Instruments and related products	3.0	0.7	3.3
Miscellaneous manufacturing	2.4	-0.2	4.1

Generally, the 18 manufacturing industries show high year-to-year variability in output per hour ratios. The variability in these ratios in the manufacturing industries is exceeded only in agriculture and construction. Both the manufacturing industries and the construction industry are cyclically-sensitive and, hence, the year-to-year variability coincides with the general business cycle. Agricultural hourly productivity rates, on the other hand, are affected by sharp changes in market demand or product supply that are not necessarily associated with the general business cycle and corresponding changes in total hours worked.

An alternate approach to the representation of year-to-year changes in job productivity is by segmentation of individual time series according to the troughs and peaks of the general business cycle. Included with the output per hour ratios are total real output and total hours worked in the 18 industry groups. These data show, for example, that both the rates of increase in total real output and the rates of decrease in total hours worked were less in each succeeding business cycle. In agriculture, the rates of increase in output per hour also were less in each succeeding cycle--indeed, a common pattern among goods-producing industries.

The changing patterns of productivity in the U.S. economy in the four

business cycles from 1958 to 1984 (with the last two cycles being counted as one) are evident from the statistical series. Generally declining levels of real gross output in the goods-producing industries since 1958 are reported. During much of this period, the services-producing industries contributed to an expanding real output. In the 1979-84 period, however, the growth in real output was generally less than in any other period.

Increases in total hours worked also have become smaller and smaller in each period. They actually declined in absolute levels in the goods-producing industries as well as in transportation and government enterprise.

The output per hour ratios bear part of the burden of declining rates of increase in total output and total hours worked. In fact, the decline in output per hour ratios was even sharper in some industry groups than the decline in total hours worked.

Of particular importance to the Minnesota economy is the shift to services and the prospects for improved productivity rates in the services-producing industries. Minnesota, with its above-average growth in services-producing industry, would benefit from such increases in worker productivity. An above-average sensitivity to the business cycle, however, is likely to dampen productivity increases insofar as output per worker would decline sharply in recession periods.

Growth in real GNP is a function of growth in output per worker and, also, employment. Most of the 2.9 percent growth in real GNP in the 1967-80 period--nearly two thirds--is attributed to growth in the employed labor force. The above-average growth in Minnesota employment in the 1967-80 period contributed to above-average growth in its own Gross State Product.

A larger share of GNP growth is attributed to growth in output per worker in the 1980-84 period than in the 1967-80 period. Limited export market

expansion, coupled with newly emerging demographic constraints, made labor productivity growth an increasingly important determinant of the 2.8 percent real GNP growth in the 1980-84 period. Similarly, the Minnesota economy depends increasingly on above-average growth in worker productivity to achieve above-average growth in its industry gross product. Thus, the rapid shift to services, together with an increasingly severe demographic constraint on the future growth of the Minnesota labor force, make doubly important a renewed focus on productivity in the work place, particularly in the services-producing industries.

#### Population and Income

Population growth and income growth oftentimes are competitive insofar as excess population becomes an added burden for an area with limited job openings. Out-migration of unemployed or underemployed workers would increase per capita income but reduce population growth.

#### Population Dynamics

Population growth differentiates many rural from metropolitan areas. In Minnesota, population growth is concentrated largely within the daily commuting zone of the core metropolitan region. Most population centers in the core metropolitan region have experienced rapid growth as a result of rural-to-urban migration in the 1960's and 1970's.

The geography of population growth in Minnesota is marked by three categories of counties--the persistent gainers, the persistent losers, and the turn-arounds. Hennepin and Ramsey are among the turn-around counties, but so are the nine rural counties that grew in the 1970's but lost population in the 1980's. The largest persistent gainers are counties within the daily commuting fields of the metropolitan area centers extending from St. Cloud to Rochester--with two exceptions: these are the "retirement counties" and the

larger rural area service centers.

Regional shifts in population are shown in Figure 3.9. In the 1970-80 period, one or more counties in 11 of the 13 development regions lost population, but this loss was small overall when compared with their population increases equivalent to almost 10 percent of the total 1970 State population. These trends were even more pronounced in the 1980-84 period, except for the positive turn-around of the two Metro Council counties.

If recent population trends were to continue with about half the counties gaining population and the rest--all rural--losing population, nearly three-fourths of Minnesota's total population in the year 2000 would reside within a daily commuting distance of the St. Cloud-to-Rochester axis, but for the two exceptions. Today the split is about one-third rural, two-thirds extended metropolitan. In 1950, it was roughly the reverse of this.

The forces working to change the economic geography of Minnesota also affect the changing balance between agriculture and new industry and between rural and urban. And they account for the declining one-industry dependency of many communities and counties in Minnesota. The distribution of one-industry dependence, as shown in Figure 3.10, correlates closely with the distribution of persistent population losers.

Still recognized are long-standing sources of Minnesota's past industrial diversity in its natural and human resources--farming, mining, manufacturing, and amenities, including access to essential services in retirement areas. For further discussion purposes, the 87 Minnesota counties by their currently dominant economic dependency as follows:

<u>Dependency</u>	<u>Number</u>	<u>Regions(s)</u>
Farming	34	Largely 1, 6W and 8
Mining	2	Entirely in 3
Manufacturing	9	Mostly 9 and 10
Government	6	Mostly 2
Retirement	10	Largely in 4, 5 7E
Ungrouped	36	Mostly in metropolitan areas

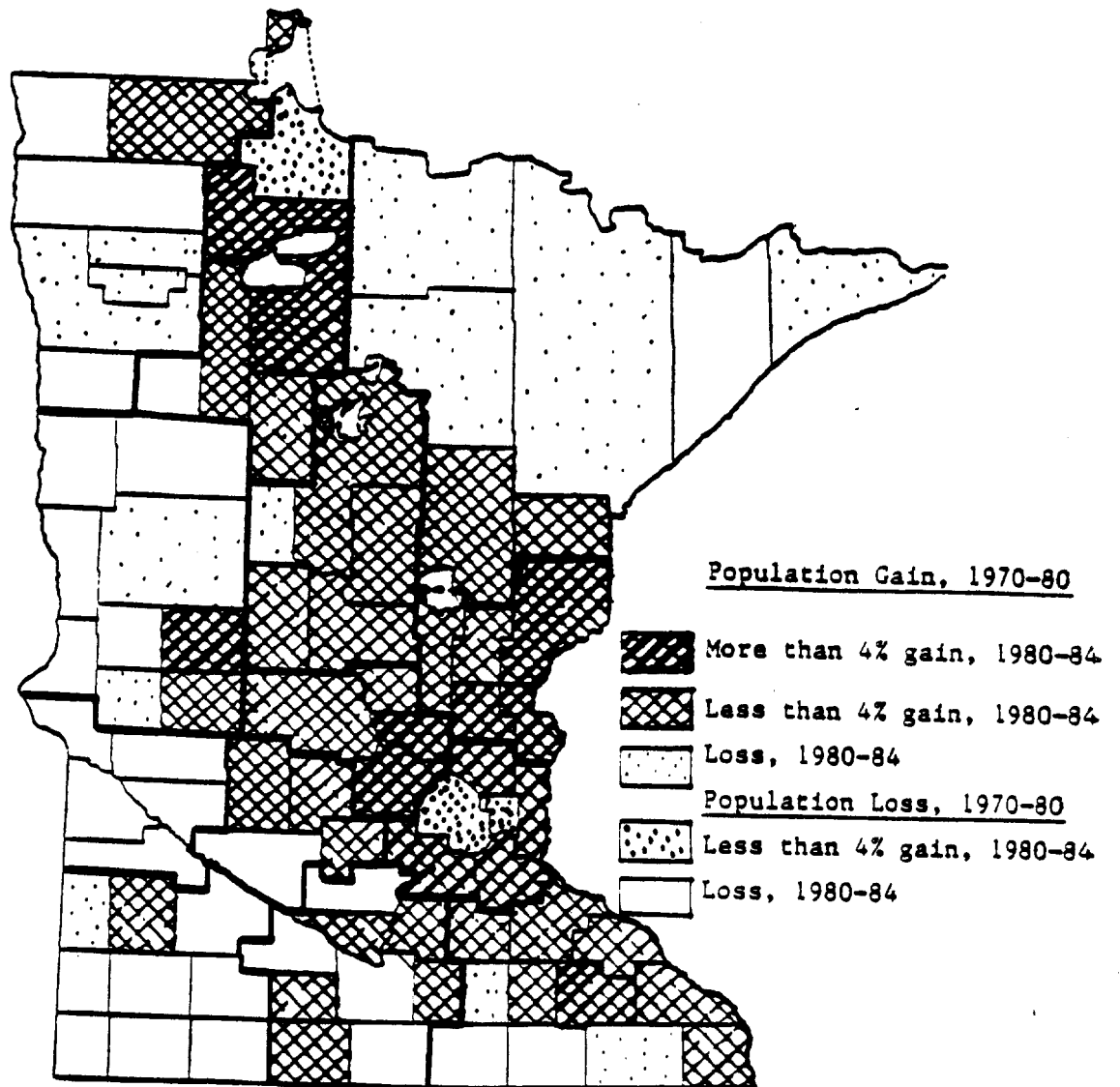


Figure 3.8 Distribution of Population Gains and Losses Among Counties and Substate Development Districts, Minnesota, 1970-80 and 1980-84.

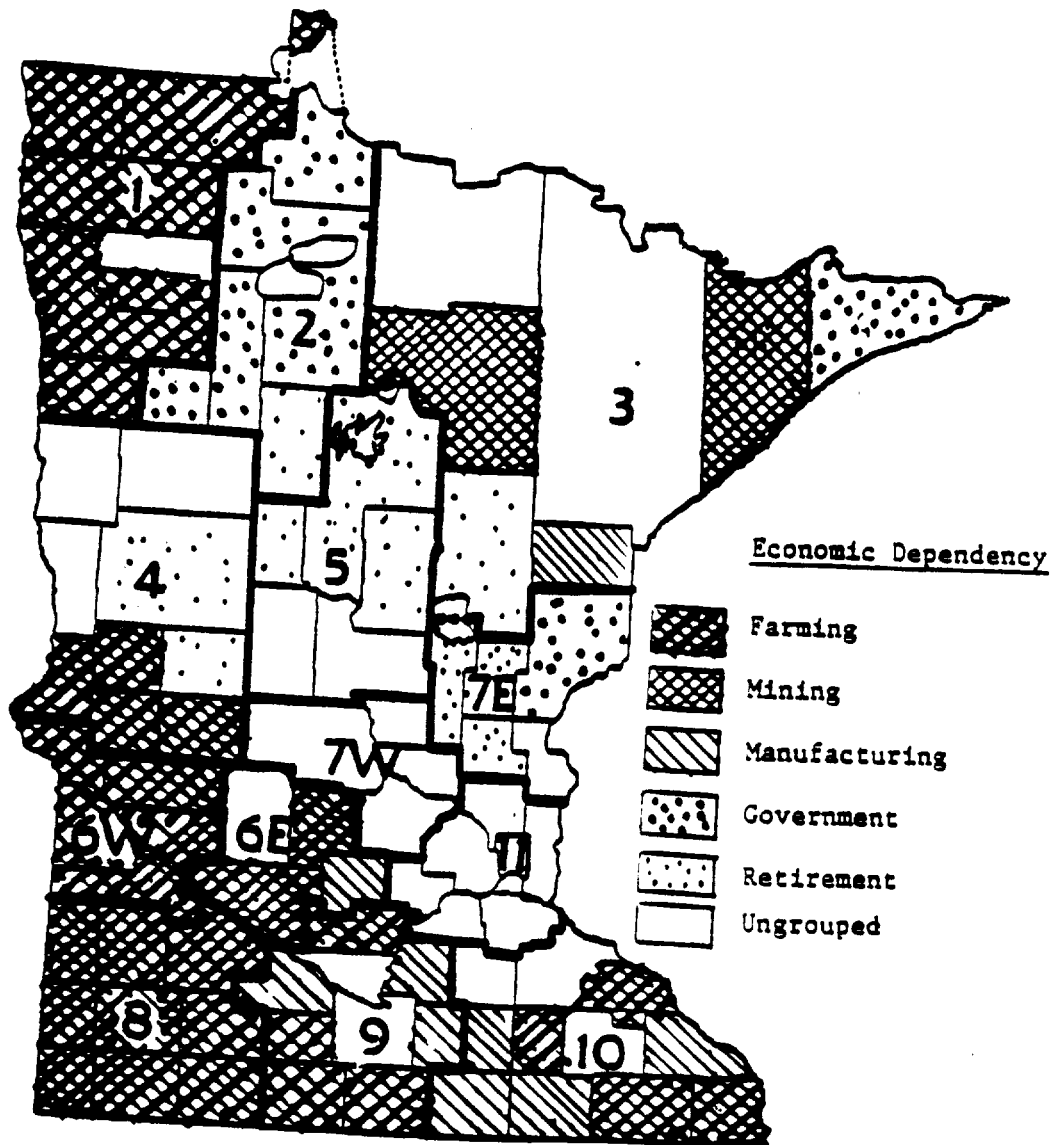


Figure 3. 9. Economic Dependency Classification of Counties and Substate Development Districts in Minnesota

All counties in Standard Metropolitan Areas (as defined by the U.S. Bureau of the Census) are ungrouped, including mining-dependent St. Louis County. Most ungrouped counties are marked by a broad, diverse economic base.

#### Personal Income Determinants

Minnesota per capita income has increased gradually from \$521, or 12 percent below the U.S. average of \$589 in 1940 to \$9688, or two percent above the U.S. average of \$9503 in 1980. In 1984, it reached \$13.5 thousand, or nearly four percent above the U.S. average of \$13 thousand.

Much of the increase in Minnesota's standing nationally in personal income growth in recent years is attributed to the steady growth in total earnings of the employed work force. However, the growth in total personal income lagged corresponding U.S. income growth in the 1940's and 1950's because of lagging population growth. In 1940, for example, total Minnesota population was 2.8 million, or 2.1 percent of the U.S. total of 132 million. By 1960, Minnesota population exceeded 3.4 million, but it had dropped to 1.9 percent of the total U.S. population of 180 million. In 1980, Minnesota population had increased to nearly 4.1 million when total U.S. population exceeded 227 million. Minnesota population had now dropped to 1.8 percent of the U.S. total.

In short, the increase in per capita income must be attributed to two critical factors--the shift in basic employment from agriculture to manufacturing and the rapid increase in labor force participation, particularly female, which more than compensated for the still-lagging population growth. In addition, persons 16 years and older have become an increasingly larger part of the total population, which further increased the employment-population ratio.

The personal income of Minnesota residents is received from many sources other than wage and salary disbursements. These include: other labor income; property income--interest, rent and dividends; and transfer payments -- unemployment insurance, worker's compensation, and retirement income.

Like wage and salary disbursements, both property income and transfer payments vary from peak to trough of the general business cycle. In Minnesota, property income increased from \$421 per person, or 14 percent of total income in 1967 to \$1600 per person, or 16 percent of total income in 1980. Transfer payments, on the other hand, increased from \$252 per person, or nine percent of total income in 1967, to \$1146 per person, or 12 percent of total income in 1980. Thus, total earnings had declined from 78 percent to 72 percent of total Minnesota personal income in the 1940-80 period.

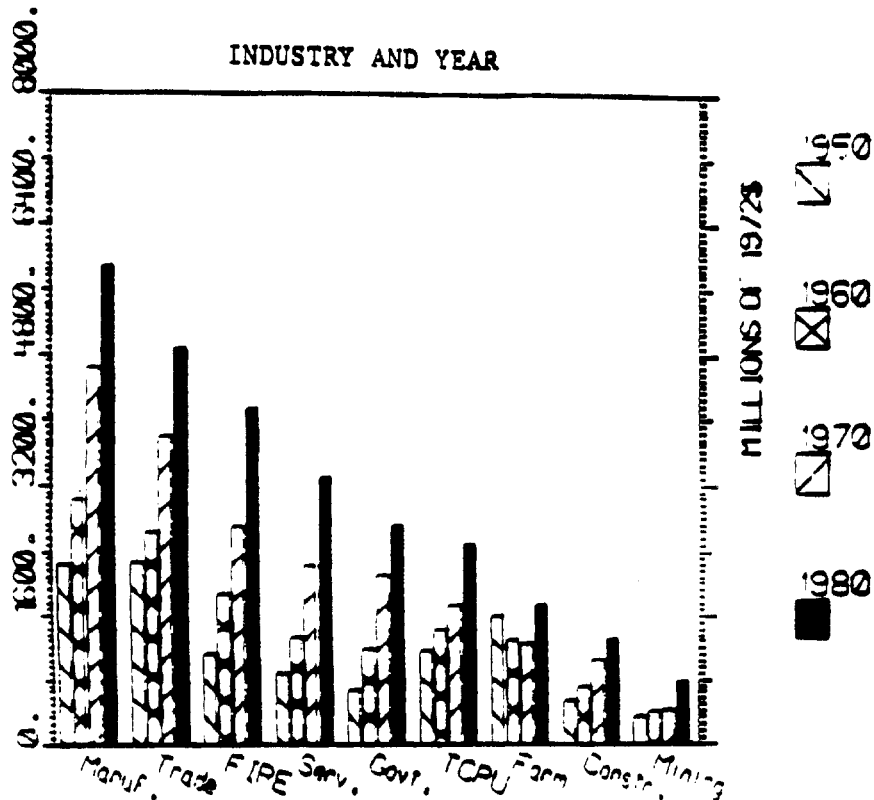
Nonetheless, wage and salary income accounts for the largest share of total personal income, while proprietorial, or self-employed, income accounts for the smallest share.

The accounting of income received by Minnesota residents is extended from personal income to total value added in the measurement of Gross State Product. Total value added originating in the Minnesota economy is presented graphically for the 30-year period from 1950-80 in Figure 3.10. Nine large industry groups are used to show the varying income and employment trends affecting individual industries in the state. When the nine industry groups are ranked according to their total value added in 1980, the largest is manufacturing and the smallest is mining.

Manufacturing also accounts for the largest share of the increase in total value added by all Minnesota industry over the 1950 to 1980 period. Agriculture, and more recently, mining, have been the largest losers in value added share. When comparing growth of Gross State Product from 1950 to 1980

Figure 3.10

Manufacturing accounts for the largest contribution to Minnesota Gross State Product among nine industry groups and mining the smallest--a ranking sustained over the 30-year period from 1950 to 1980.



Source: Minnesota Council of Economic Advisors, 1974, and Minnesota Department of Economic Development, 1983.

with its industry distribution in 1980, the data show manufacturing with a 22 percent share of the growth in GSP increased its distribution from 20.7 percent of the total in 1950 to 21.6 percent of the total in 1980.

Conversely, the farm sector's 0.7 percent share of the growth in GSP resulted in a decrease in its distribution from 14.9 percent in 1950 to 6.4 percent in 1980. The Gross State Product accounts for the remuneration of all primary inputs--labor, capital, and entrepreneurship.

#### Income Distribution

The need for redistribution of total area income remains a gnawing concern of a caring and compassionate society. It is also a concern of state government in its various efforts to improve individual access to public services and reduce economic disparities between regions.

Disparities in income received among socio-economic groups and substate regions is attributed to differences in basic economic activity and related differences in industry staffing patterns and earnings. The geographic disparities due to industry mix are reinforced by popular attitudes and prevailing management practices.

According to data from the 1980 U.S. Census of Population, the ranking of earnings by occupation yields a bimodal distribution. One peak in earnings occurs in the \$2,000 to \$5,999 range while a second peak occurs in the \$10,000 to \$14,999 range. When earnings are separated into male and female, each gender has a single highest frequency earnings class. Disparities in earnings between male and female workers in the same occupation account for part of the two peaks. Generally, the lower-paying, part-time service jobs account for the lower peak while higher-paying full-time professional, managerial and technical jobs account for the upper peak.

Because of increasing female participation in the labor force, the

underlying bimodal distribution of earnings per worker has become more apparent in recent years. However, this pattern largely disappears in household income distributions because of the large number of two worker households. Having both male and female labor force participation in the same household increases total household income. Thus, the lower mode does not appear in income distribution of tax filers or households.