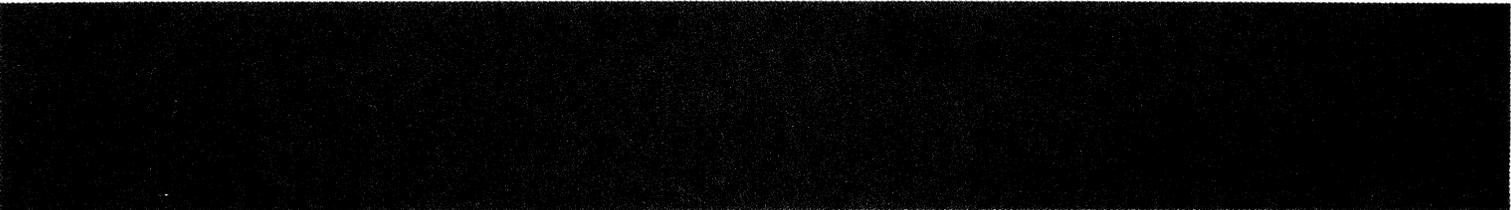


Income Trends and Projections for Minnesota and Its Substate Development Regions

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Abstract

Total earnings of the employed work force in Minnesota and its substate development regions are presented for an 11-industry breakdown of the economy. Total personal income is derived, in large part, from total earnings. Both total earnings and personal income levels are presented for the 30-year period from 1970 to 2000. The shift-and-share method is used in the preparation of the substate total earnings and personal income projections.

Income Trends and Projections for Minnesota and Its Substate Development Regions¹

Summary and Conclusions

Total personal income per person in Minnesota quadrupled in the 25 years from 1950 to 1975. Slightly more than half of the increase was due to inflation. Thus real income per person almost doubled, from \$1,942 in 1950 to \$3,814 in 1975 (in constant 1967 dollars). It is projected to double again by 2000.

Minnesota per capita income is gradually converging towards the U.S. average. Occasionally, as in 1973, it exceeded the U.S. average. It is projected to consistently equal and even exceed the U.S. average by the 1980's.

Much of the improvement in the Minnesota income levels is due to a changing industry composition, with above-average growth in employment in those industries with above-average earnings per worker. While agricultural employment is becoming less important in the state, earnings per farm proprietor are increasing relative to the nonfarm average, which contributes to non-farm employment growth. In addition, earnings per worker in the more rapidly growing industries are near or above the average earnings per worker in the nation.

Changes are projected, also, in the substate regional distribution of total earnings and income. While total earnings and income became more and more concentrated in the Metropolitan Council Region in the 1950 to 1970 period, a sharp shift occurred in the 1970 to 1975 period. Farm income levels nearly tripled from 1970 to 1973, while total employment in manufacturing dropped 8 percent from 1974 to 1975, with the largest drop in the Metropolitan Council Region. The shifts in the geographic distribution of income and employment accounted for the reversal of the 1950 to 1970 trends toward metropolitan concentration.

Growth in personal income is projected for all substate regions, with the largest growth being confined to the Metropolitan Council Region. This growth will

be shared, however, by an expanding metropolitan region which includes an increasingly larger number of counties outside the seven-county Metropolitan Council Region.

The three principal income components—total earnings, property income, and transfer payments—are projected to increase at varying rates in the 13 substate development regions. However, total earnings per worker and total property income per person will remain high in the Metropolitan Council Region. Transfer payments, which include payments to individuals from retirement, unemployment, medical assistance, and public assistance programs, generally are higher in non-metropolitan regions than in the Metropolitan Council Region. Transfer payments increase, moreover, when total earnings per worker decline. In 1975, transfer payments ranged from only 11 percent of total personal income in the Metropolitan Council Region to 25 percent of total personal income in the Headwaters Region. The total net earnings per worker in the Headwaters Region was only 40 percent of its level in the Metropolitan Council Region.

Five sources of change in total personal income payments are identified. They are: population, employed work force participation (indicated by proportion of total population in employed work force), earnings per worker, property income per person, and transfer payments per person. The largest source of change in money income during the 1970-75 period was total earnings per worker. In real income terms, the largest source of change was the rate of employed work force participation. For the 1975 to 2000 period, however, total earnings per worker is projected as the largest single source of real income growth in the state.

Introduction

Future income growth in Minnesota is projected to compare closely with future income growth in the U.S. The possibility of sharp fluctuations in personal income levels persists, however, because of the continuing importance of agriculture, forestry, mining, and other income-volatile industries in Minnesota. Study of the industry sources of these fluctuations helps in

¹The author gratefully acknowledges the assistance of J.M. Callaway, G.H. Michaels, L.A. Laulainen, Jr., and M. Chen in the preparation of the data series used in this study, and the helpful comments and suggestions of Ronald Dorf, John Helmberger and Andrea Lubov in the preparation of this report.

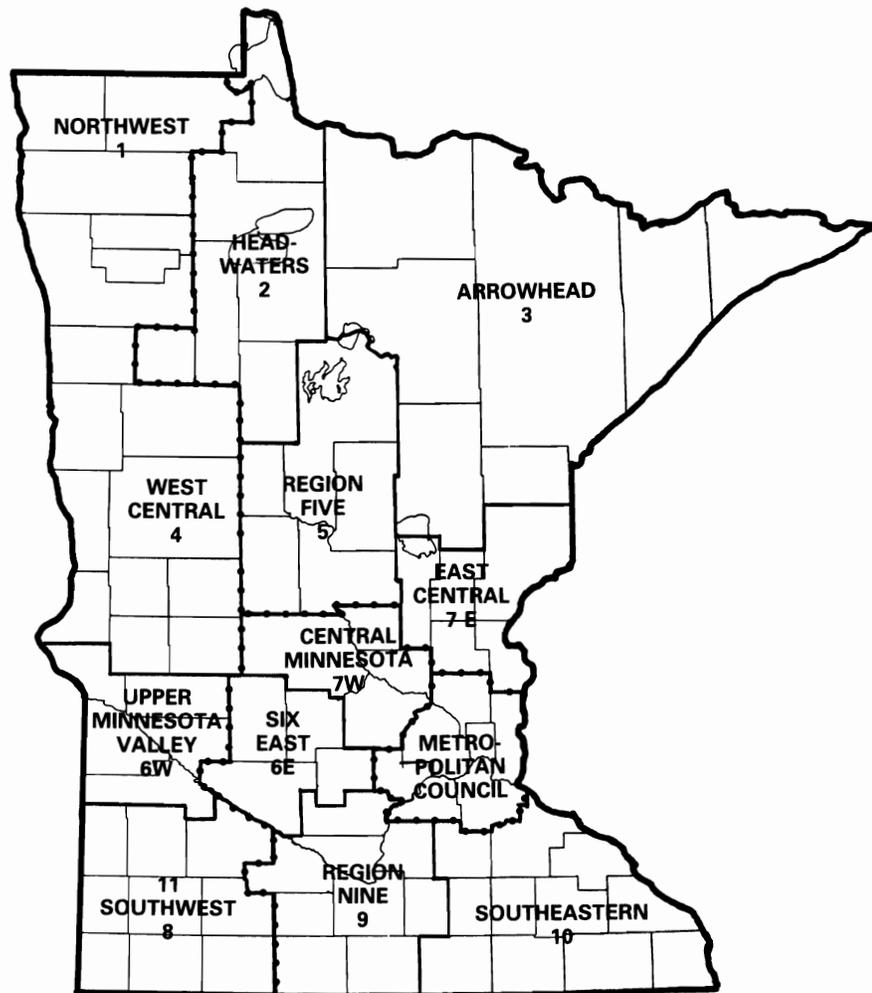


Figure 1.1. Substate planning and development districts, Minnesota, 1978.

assessing the severity of their effects on the Minnesota economy and its people. It also provides a statistical basis for the preparation of income projections for the state and its development regions (Figure 1.1).

Study Objectives

This study was initiated for one principal purpose: to prepare a consistent series of personal income projections for Minnesota and its 13 substate regions, including assessment of this series in the light of recent trends in the industry and substate regional distribution of income sources in the state. This purpose is represented by the three study objectives, the first of which was to compare personal income trends and projections for Minnesota and the U.S. for the 50-year period from 1950 to 2000. The second objective was to account for period-to-period variability in the relation of Minnesota to U.S. income levels and the third was to account for substate region differences in per capita income levels.

During the first half of the 50-year period from 1950 to 2000, total personal income increased from \$4.2 billion to \$22.5 billion in Minnesota and from \$226 billion to \$1,258 billion in the U.S. Total population

during this period increased from 3 million to 3.9 in Minnesota and from 152 million to 213 million in the U.S. Thus, the Minnesota share of total income and population declined slightly while per capita income increased.

With reference to the second objective, the findings show that period-to-period variability is due, in part, to differences in personal income sources. More of total personal income originated from farming in Minnesota than in the U.S. Both property income and transfer payments per person have lagged behind U.S. averages.

The per capita level of each income component in Minnesota relative to the same component in the U.S., as shown in Table 1.1, is derived for selected years as follows:

Income source	Minnesota as proportion of U.S. average per capita income			
	1967	1970	1973	1975
	(percent)			
Farm earnings	196	232	314	145
Nonfarm earnings	95	98	104	97
Personal contributions	93	93	104	109
Property income	92	95	93	97
Transfer payments	98	93	94	90
Total personal income	94	98	104	96

Table 1.1. Estimated total personal income payments per person (in current dollars), by income source, Minnesota and U.S., 1950-1976.¹

Year	Minnesota							United States						
	Total	Earnings farm	Personal contributions	Residence adjustment	Property income	Transfer payments	Total personal income	Total	Earnings farm	Personal contributions	Property income	Transfer payments	Total personal income	
	(dollars)													
1950	1,162	195	17	-2	162	102	1,407	1,234	112	17	177	102	1,496	
1959	1,614	131	43	-6	261	153	1,979	1,784	80	40	277	151	2,172	
1962	1,798	133	52	-9	300	176	2,214	1,936	85	55	321	179	2,381	
1965	2,133	181	64	-2	371	204	2,572	2,247	91	69	401	206	2,785	
1966	2,322	197	85	-3	400	222	2,790	2,431	96	87	432	225	3,001	
1967	2,452	174	99	-5	422	262	2,997	2,591	89	107	458	266	3,188	
1968	2,649	169	110	-7	462	291	3,366	2,782	88	114	490	299	3,457	
1969	2,898	182	124	-10	504	306	3,513	3,009	99	130	527	327	3,733	
1970	3,096	232	128	-11	542	361	3,859	3,145	100	137	570	388	3,966	
1971	3,191	202	146	-11	583	422	4,038	3,264	100	147	596	452	4,195	
1972	3,441	245	161	-11	601	457	4,328	3,573	118	165	633	496	4,537	
1973	4,147	609	209	-11	659	527	5,112	3,982	194	201	706	562	5,049	
1974	4,328	466	240	-11	767	625	5,469	4,258	165	225	795	658	5,486	
1975	4,508	376	253	-10	837	735	5,817	4,464	159	234	857	816	5,903	
1976	4,756	191	279	-10	910	792	6,169	4,878	131	255	934	884	6,441	

¹Based on data from the Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C., 1977.

Table 1.2 Estimated total personal income per person in specified development region, Minnesota, 1970-1975.¹

Region		Total (current dollars)						Proportion of state average		Average annual change 1970-75
Number	Title	1970	1971	1972	1973	1974	1975	1970	1975	
		\$	\$	\$	\$	\$	\$	%	%	%
1.	Northwest	3,003	3,186	3,523	5,436	5,800	5,161	77.8	88.7	14.4
2.	Headwaters	2,101	2,234	2,387	2,954	3,096	3,281	54.4	56.4	11.2
3.	Arrowhead	3,266	3,448	3,680	4,092	4,546	5,168	84.6	88.9	11.6
4.	West Central	2,788	2,978	3,228	4,618	4,812	4,603	72.2	79.1	13.0
5.	Region Five	2,485	2,614	2,819	3,344	3,668	3,855	64.4	66.3	11.0
6W.	Upper Minnesota Valley	2,996	3,155	3,426	666	5,839	5,296	77.6	91.0	15.4
6E.	Six East	3,342	3,474	3,765	5,321	5,395	5,659	86.6	97.3	13.9
7W.	Central Minnesota	2,991	3,158	3,406	5,027	4,358	4,683	77.5	80.5	11.3
7E.	East Central	3,091	3,104	3,331	3,872	4,118	4,384	80.1	75.4	8.4
8.	Southwest	3,212	3,232	3,699	5,269	4,886	5,226	83.3	89.8	12.5
9.	Region Nine	3,369	3,437	3,781	5,291	5,407	5,682	87.3	97.7	13.7
10.	Southeastern	3,594	3,708	4,004	4,849	5,059	5,489	93.1	94.4	10.5
11.	Metropolitan Council	4,574	4,814	5,119	5,646	6,159	6,624	118.5	113.9	9.0
	State	3,859	4,038	4,328	5,112	5,469	5,817	100.0	100.0	10.1
	Nation	3,966	4,195	4,537	5,049	5,486	5,903	102.8	101.5	9.8

¹Based on data from U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Economic Information System*, 1977.

Above-average levels of Minnesota personal income components in 1973 were associated with above-average farm earnings. Both transfer payments and property income were below U.S. averages. The additional breakdown of personal income components and year-to-year variability reveal similar trends in the Minnesota and the U.S. income components.

To fulfill the third objective of this study, Minnesota state-level income series were compiled from county-level data, grouped by substate development region. The 13 substate development regions, in turn, were grouped into three multi-region and one single-region economic accounting entities for making region-to-region income comparisons.²

Region-to-region variability in income levels is indicated in the estimated total personal income per person for the 13 substate development regions (Table 1.2). The lowest per person income levels were re-

ported for the Headwaters Region, the highest for the Metropolitan Council Region. In 1970, the lowest per person income was only 46 percent of the highest. This percentage increased to 50 percent but the absolute

²The four multi-region groups are identified by their economic base, which is defined as the export-producing activity in each region. Basic employment is the industry employment engaged in producing goods and services for non-residents while basic income is the total regional income derived from income payments of non-resident income sources to state residents. The four regional groupings are identified by their respective economic base as follows:

- (1) Four dominantly agricultural regions: Northwest; West Central; Six West (now called Upper Minnesota Valley); and Southwest.
- (2) Four transitional agricultural-industrial regions: Central Minnesota; Six East; Region Nine; and Southeastern.
- (3) Four transitional primary resource-industrial regions: Headwaters; Arrowhead; Region Five; and East Central.
- (4) One dominantly urban-industrial region: Metropolitan Council. One region in each of three regional groupings—Metropolitan Council, East Central, and Central Minnesota—is part of an expanded metropolitan region where most of recent population, employment, and income growth has occurred.

difference increased by over one-third from \$2,473 to \$3,343. The largest increases were in the four dominantly agricultural regions.

Method of Procedure

In this report, a 25-industry breakdown of the Minnesota economy was used in the data preparation. This breakdown, except for the manufacturing detail (of 15 industry groups), corresponds with the 11-industry breakdown in the Regional Economic Information System (REIS) published periodically by the U.S. Department of Commerce.³ The manufacturing industry breakdown in this report is identical to the one used in the 1972 OBERS projections, which differentiate among 15 two and three-digit manufacturing industry groups.⁴ Trade and service industries, on the other hand, are not differentiated in either the OBERS income projections or the REIS income estimates. Lack of industry detail in the trade and service industries is a lesser limitation than lack of industry detail in the industries which experience year-to-year fluctuations and, also, more gradual long-term changes in employment levels. In reporting the study findings, only the 11-industry breakdown is used in the tabular presentation.

Personal income levels per person are deflated by an index of prices and income for long-run, period-to-period comparisons. These comparisons show a gradual lessening of the annual increase in per capita income levels and, also, in the differential between Minnesota and U.S. income levels.

Lessening of the income differential means a slightly faster income doubling rate for the state than the nation. Real personal income per capita in Minnesota approximately doubled from 1950 to 1975 and it is projected to approximately double again by 2000. For the U.S., the doubling rate is two to three years longer than for Minnesota. By 2000, the projected personal income levels for both Minnesota and the U.S. exceed \$8,000 per person in 1967 dollars.

Convergence of substate regional per capita income levels towards a statewide average and the convergence of this average towards a U.S. average has been characteristic of recent regional, state, and national income trends. To identify these trends and to assess their implications for economic growth in Minnesota and its 13 substate development regions, industry levels of employment and earnings were studied.⁵ The shift-and-share method of forecasting industry employment for Minnesota and its substate regions was also used to forecast total earnings of the employed work force in the 25 industry groups.⁶

³U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Economic Information System*, 1977.

⁴U.S. Water Resources Council, 1972 OBERS Projections, *Regional Economic Activity in the U.S., Series E. Population*, U.S. Government Printing Office, Washington, D.C., 20402, April, 1974.

⁵Wilbur R. Maki, Gregory H. Michaels, Leonard A. Laulainen, Jr. and Mason Chen, *Employment Trends and Projections for Minnesota and Its Substate Development Regions*, Bulletin 531, Agricultural Experiment Station, University of Minnesota, 1979.

The results of this study are presented under four major headings—industry earnings, total personal income, income change sources, and implications for substate development. Total earnings of the employed work force in Minnesota and its substate regions are presented first because of the major importance of this component in the total income of Minnesota residents. Fluctuations in total earnings are a major source of income variability in the state, but these fluctuations will vary from region to region because of regional differences in industry composition. Both total earnings and total personal income payments are examined, therefore, by region, for the 30-year period from 1970 to 2000. Finally, the implications of these differences are discussed in terms of the distribution of income, employment, and population in the seven-county Metropolitan Region and the rest of the state.

Industry Earnings

In this chapter, U.S. industry earnings are presented first as a background for assessing reported and projected trends in total earnings of the employed work force in Minnesota. Minnesota income series are then compared with the corresponding income series for the U.S. These series are disaggregated into 11 industry groups for each of the 13 substate regions.

Total Earnings of Employed Work Force

Total earnings of the employed work force account for about 75 percent of the total personal income payments in the U.S. This percentage has fluctuated in the post-1970 period from a high of 79.3 in 1970 to a low of 75.6 in 1975 and a new high of nearly 80 percent in

⁶Total change in earnings is partitioned into the three effects for each of the 25 industry groups in the form,

$$\text{earn}_i' = (1 + A + B_i + C_i) \text{earn}_i$$

where,

$$\text{earn}_i' = \text{total earnings in } i\text{-th industry in region, year } (t+1).$$

$$A\text{earn}_i = \text{national-growth effect of } i\text{-th industry in region, year } (t) \text{ to year } (t+1).$$

$$B_i\text{earn}_i = \text{industry-mix effect of } i\text{-th industry in region, year } (t) \text{ to year } (t+1).$$

$$C_i\text{earn}_i = \text{regional-share effect of } i\text{-th industry in region, year } (t) \text{ to year } (t+1).$$

The three coefficients are derived as follows:

$$A = \frac{\text{EARNN}'}{\text{EARNN}} - 1$$

$$B_i = \frac{\text{EARN}_i'}{\text{EARN}_i} - \frac{\text{EARNN}'}{\text{EARNN}}$$

$$C_i = \frac{\text{earn}_i'}{\text{earn}_i} - \frac{\text{EARN}_i'}{\text{EARN}_i}$$

where,

$$\text{EARN}_i' = \text{total earnings in } i\text{-th industry in nation, year } (t+1)$$

$$\text{EARN}_i = \text{total earnings in } i\text{-th industry in nation, year } (t)$$

$$\text{EARNN}' = \sum_i \text{EARN}_i', \text{ total earnings in all industries in the nation, year } (t+1)$$

$$\text{EARNN} = \sum_i \text{EARN}_i, \text{ total earnings in all industries in the nation, year } (t)$$

All U.S. earnings are given; only the forecast industry earnings, earn_i' , must be derived for each industry and region. Moreover, in this study, all U.S. and Minnesota projections were acquired from the 1972 OBERS projections. Only the county-level projections were derived by use of the shift-and-share method.

1978. Total earnings rose from \$641 billion in 1970 to \$951 billion in 1975. Nearly three-fourths of the increase was due to inflation and only one-fourth was due to an increase in real earnings per worker.

The total earnings (in 1967 dollars) of the employed work force in the U.S. is projected to increase from \$562 billion in 1970 to \$1 trillion in 1985 and \$1.7 trillion in 2000.⁷ Projected annual rates of increase in total earnings for selected periods are as follows:

Period	Total earnings (percent)	Total employed work force	Earnings per worker
1970-1975	1.9	1.2	0.7
1970-1980	4.0	1.9	2.0
1980-1985	3.5	1.0	2.4
1985-1990	3.5	1.0	2.4
1990-2000	3.5	1.1	2.4

Annual increases in total earnings are compared with annual rates of increase in employment and earnings per worker simply to show period-to-period differences in these rates. For example, the annual rate of increase in the U.S. employed work force is projected to peak in the five-year period 1975 to 1980. The projected increase in real earnings per worker, however, is very large for the 1975-1980 period; indeed, it is larger than the projected increases in the post-1980 period. The annual increases in both the employed work force and earnings per worker are projected to decline in the 1980's and 1990's. It is against this background of projected U.S. economic change that the Minnesota projected total earnings are presented.⁸

⁷All U.S. earnings and income projections used in this study were obtained from the 1972 OBERS projection series cited earlier (see p. 6).

⁸All Minnesota earnings and income projections used in this study were obtained by adjusting the 1972 OBERS projection series to the population and labor force projections prepared by the state demographer (see footnote 5).

Total earnings of the employed work force in Minnesota increased 49.8 percent from \$11.8 billion in 1970 to \$17.7 billion in 1975. During the same period, total earnings of the U.S. employed work force increased 47 percent from \$641 billion to \$941 billion. The Minnesota share of the total U.S. earnings increased from 1.9 percent to 2 percent.

Above-U.S.-average rates of increase in total earnings in Minnesota for the 1970-1975 period occurred in seven of the 11 major industry groups. In three of the nine groups—manufacturing, transportation, communications and utilities, and trade—the annual rates of increase in total earnings were larger in Minnesota than in the U.S. The agricultural prosperity accounted for part of the growth in the other sectors also.

Real earnings of the employed work force in Minnesota industries are projected to increase from \$10.5 billion in 1970 to \$29.7 billion in 2000 in 1967 dollars (Table 2.1). Total real earnings are projected to double in less than 20 years. This is equivalent to an annual increase of slightly more than 3.3 percent.

Projected increases in total earnings are slightly lower for Minnesota than the U.S. for the 1975 to 1985 period, as follows (in annual percentage change):

Period	Total earnings (percent)	Total employed work force	Earnings per worker
1970-1975	2.1	2.4	-0.2
1970-1980	4.0	1.9	2.1
1980-1985	3.4	0.9	2.4
1985-1990	3.3	0.9	2.5
1990-2000	3.3	0.8	2.4

The lower Minnesota rates are due largely to the lower rates of increase in employed work force. A slightly larger share of industry employment with above-average growth in earnings is projected for Minnesota than the rest of the nation.

Table 2.1. Estimated and projected total earnings (in 1967 dollars) in specified industry, Minnesota, 1970-2000.

Industry Number Title	Estimated ¹		Projected ²			
	1970	1975	1980	1985	1990	2000
(value in thousands of 1967 dollars)						
1. Agriculture, forestry, fishing	805,416	993,569	743,032	773,205	802,125	899,033
2. Mining	132,844	151,964	146,657	151,695	156,346	172,319
3. Construction	711,681	663,645	1,070,805	1,244,197	1,441,203	1,912,503
4. Manufacturing	2,623,260	2,728,062	3,800,469	4,412,031	5,117,675	6,776,264
5. Transportation, communications, utilities	749,299	866,285	1,081,038	1,257,551	1,458,392	1,951,714
6. Trade	1,927,603	2,157,304	2,707,495	3,139,654	3,629,470	4,882,275
7. Financial, insurance, real estate	518,589	574,096	845,758	1,029,075	1,248,344	1,808,922
8. Services	1,474,081	1,673,841	2,715,115	3,377,851	4,189,210	6,282,568
9. Federal government	262,659	286,291	389,330	468,440	561,779	780,515
10. State and local government	1,173,631	1,438,165	1,937,148	2,365,075	2,878,519	4,176,954
11. Military	71,141	60,359	72,146	79,922	88,370	108,423
12. Total earnings	10,451,204	11,603,603	15,509,063	18,298,696	21,571,532	29,741,488

¹Based on unpublished data from the Regional Economic Information System (REIS), Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C., 1977.

²Based on total earnings projections (adjusted to current State population projections) in: U.S. Water Resources Council, 1972 OBERS Projections, Regional Economic Activity in the United States, Series E Population, U.S. Government Printing Office, Washington, D.C., April, 1974.

Shifts in the industry distribution of employment are identified with several of the major industry groups. A detailed industry breakdown of the mining sector, the transportation, communications and utilities sector, and the services sector show contrasting trends in employment and earnings per worker.⁹ Total employment in metal ore mining is projected to decline after reaching peak levels in 1980. Total employment is projected to decline also in the 1980's in the quarrying and other mining, railroad transportation, trucking and warehousing, and the utilities industries. Projected earnings per worker are above-average in three of the four declining industries. In railroad transportation, for example, projected total earnings per worker are among the highest in the state. Three of the four remaining industries—other transportation, communications, and professional services—are projected to increase at above-average rates in total employment. Both the levels and rates of growth of total earnings per worker also are above-average in the three rapidly-growing industries. Thus, the changing industry levels of employment and earnings per worker account for the increasing rates of growth of total earnings in two of the three major industry groups in the state.

Substate Distribution of Total Earnings

The substate regional income projection series presented in this report is derived from the U.S. Water Resources Council Series E population and related income and employment projections to 2020. This is available for each state, economic area, and water resources sub-area in the U.S. The Minnesota substate series is compiled from the county-level extensions of the OBERS income projections.¹⁰

A two-step approach is used in the presentation of the substate series of total earnings, by industry. The 1970 and 1975 total earnings for 11 industry groups are compared first for each of the 13 substate regions. All values are in current dollars. In the second set of comparisons, total earnings are in 1967 dollars. Current 1970 and 1975 dollars are deflated by the factors 1.130 and 1.525, respectively, to convert current dollars into constant dollars.

The four groupings of regions cited earlier (see p. 5) are used in comparing the region-to-region changes in total earnings from 1970 to 1975 and from 1970 to 2000. The regional groupings conform with those used in the companion study of Minnesota employed labor force trends and projections cited earlier. Each regional grouping is identified by its economic base

which was classified as dominantly agricultural, transitional agricultural-industrial, transitional primary resource-industrial, and dominantly urban-industrial.

Dominantly agricultural base

The four dominantly agricultural regions—Northwest, West Central, Six West, and Southwest—experienced an increase of \$673.2 million in total earnings in the 1970 to 1975 period. This is equivalent to a 65 percent increase in current dollars. The four-region relative share of total earnings of the employed work force increased from 8.7 percent to 9.6 percent of the state total in the five-year period at an annual rate of 10.6 percent, as shown here:

Region	Estimated		Annual rate (%)
	1970 (mil \$)	1975 (mil \$)	
Northwest	208.3	363.5	11.8
West Central	349.5	575.1	10.5
Six West/Upper Minnesota Valley	135.6	234.1	11.5
Southwest	338.9	532.8	9.5
Total or average	1,032.3	1,705.5	10.6

In 1967 dollars, total earnings in the four dominantly agricultural regions are projected to increase 166 percent from \$913 million in 1970 to \$2,428 million in 2000. The largest percentage increases are projected for the West Central and Southwest Regions, the smallest for the Northwest Region. This projected pattern of growth is inconsistent with the reported income changes for 1970 to 1975 period.

Projected total real earnings (in 1967 dollars) are summarized for the four regions, as follows:

Region	Estimated		Projected 2000 (mil. \$)	Annual rate	
	1970 (mil. \$)	1975 (mil. \$)		1970-1975 (%)	1970-2000 (%)
Northwest	184.3	238.3	473.2	5.3	3.2
West Central	30.2	377.1	870.8	4.1	3.5
Six West/Upper Minnesota Valley	120.0	153.3	265.6	5.0	2.7
Southwest	299.8	349.3	818.7	3.1	3.4
Total or average	913.3	1,118.2	2,428.3	4.1	3.3

The four-region relative share of total earnings of the employed work force is expected to decline from 8.7 percent to 8.2 percent of the state total in the 30-year period. The projected 1970 to 2000 annual rate of change is 80 percent at the reported 1970 to 1975 annual rate of change for this group of regions.

The large reported change in total earnings of the employed work force in the four dominantly agricultural regions was due, in part, to large increases in agricultural earnings from 1970 to 1975. Total earnings in agriculture were lower in both 1969 and 1971 than in 1970, and hence, the 1980 and post-1980 earnings levels are lower than they would have been if projected from a 1970 base year (rather than an average of the three base years). In 1967 dollars, total earnings in agriculture are projected to decline below 1970 levels in two of the regions, as follows:

⁹See: U.S. Water Resources Council, *op. cit.*, for breakdown of mining sector and Maki, Michaels, Laulainen and Chen, *op. cit.*, for breakdown of other sectors.

¹⁰The shift-and-share technique was used in extending the water resources sub-area income projections to the county level in the Upper Mississippi River Basin. The county-level projections were then compiled by sub-state region. Two data series are derived; one based on state-level industry totals, the other on region-level, industry-wide totals. Small differences occur between the two series which do not, however, affect the study findings.

Region	Estimated		Projected		Annual rate	
	1970	1975	1980	2000	1970-1975	1970-2000
	(mil. \$)	(mil. \$)	(mil. \$)	(mil. \$)	(%)	(%)
Northwest	59.9	93.0	47.0	56.8	9.2	-0.2
West Central	78.1	96.9	60.4	72.3	4.4	-0.3
Six West/Upper Minnesota Valley	50.7	70.1	52.8	54.1	6.7	0.2
Southwest	127.5	141.5	151.2	190.6	2.1	1.3
Total or average	316.2	401.4	311.4	373.8	4.9	0.6

Estimated 1970 and 1975 earnings exceed projected levels because of the recent favorable economic status of agriculture in the dominantly agricultural regions. Projected totals are not intended to provide annual forecasts of total earnings which can be compared with the annual estimates reported in the Regional Economic Information System. Rather, the earnings projections indicate long-term trends from a given base-year, which, in the OBERS projection series, is an average of several years.

Transitional agricultural-industrial base

The four transitional agricultural-industrial regions—Six East, Central Minnesota, Region Nine and Southeastern—border the Metropolitan Council Region. They receive much of the industrial spillover from the metropolitan core regions as a result of industry dispersion to less densely populated areas.

In the transitional agricultural-industrial regions, total earnings increased 61 percent from \$2,197.0 million to \$3,534.1 million in the 1970 to 1975 period (in current dollars), as follows:

Region	Estimated		Annual rate
	1970	1975	
	(mil. \$)	(mil. \$)	(%)
Six East	243.3	433.3	12.2
Central Minnesota	346.2	584.1	11.0
Region Nine	544.5	909.1	10.8
Southeastern	1,062.9	1,607.5	8.6
Total or average	2,197.0	3,534.1	10.0

The estimated 1970 to 1975 annual rate of increase in total earnings (in 1967 dollars) is larger than the projected 1970 to 2000 annual increase in two of the four regions. The projected annual rates of increase for the 1970-2000 period are as follows:

Region	Estimated		Projected		Annual rate	
	1970	1975	2000	1970-1975	1970-2000	
	(mil. \$)	(mil. \$)	(mil. \$)	(%)	(%)	
Six East	215.3	284.2	688.3	5.7	3.9	
Central Minnesota	306.3	383.0	1,195.4	4.6	4.6	
Region Nine	481.8	596.0	1,510.5	4.3	3.9	
Southeastern	940.5	1,054.0	2,834.6	2.3	3.7	
Total or average	1,943.9	2,317.2	6,228.8	3.6	4.0	

Total earnings from agriculture increased 24 percent from \$382.9 million in 1970 to \$476.7 million in 1975. The largest percentage increase in total earnings from agriculture occurred in the Six East Region and the smallest in the Southeastern Region. The regional distribution of agricultural total earnings, in 1967 dollars, is summarized for the 1970-2000 period as follows:

Region	Estimated		Projected		Annual rate	
	1970	1975	1980	2000	1970-1975	1975-2000
	(mil. \$)	(mil. \$)	(mil. \$)	(mil. \$)	(%)	(%)
Six East	61.1	87.4	53.9	62.5	7.4	0.1
Central Minnesota	44.3	56.9	30.3	44.7	5.1	0
Region Nine	125.8	169.5	133.9	150.4	6.1	0.6
Southeastern	151.7	162.9	129.7	149.8	1.4	0
Total or average	382.9	476.7	347.8	407.4	4.5	0.2

Manufacturing industries are projected to contribute an increasingly larger proportion of total earnings in each of the four regions. For the 1970 to 1975 period, however, the reported increase was only 57 percent of the projected 1970 to 1980 annual increase and 68 percent of the projected 1970 to 2000 annual increase. In 1970, manufacturing employment accounted for 24.1 percent of total earnings in the four transitional regions. This compares with 19.7 percent of total earnings derived from agriculture in 1970.

The regional distribution of total earnings from manufacturing employment is summarized as follows:

Region	Estimated		Projected		Annual rate	
	1970	1975	1980	2000	1970-1975	1975-2000
	(mil. \$)	(mil. \$)	(mil. \$)	(mil. \$)	(%)	(%)
Six East	40.0	51.0	73.1	171.7	5.0	5.0
Central Minnesota	60.0	72.7	88.2	191.6	3.9	3.9
Region Nine	105.8	127.1	186.5	384.5	3.7	4.4
Southeastern	262.1	282.6	392.5	757.2	1.5	3.6
Total or average	467.9	533.4	740.3	1,505.0	2.7	4.0

Only in Six East Region and Region Nine were total earnings of the employed labor force in manufacturing below those in agriculture in 1970 or 1975. By 1980, projected total earnings of manufacturing exceed those in agriculture. By 2000, projected manufacturing accounts for 24.2 percent of projected total earnings as compared to 6.5 percent for agriculture.

Transitional primary resource-industrial base

The four transitional primary resource-industrial regions—Headwaters, Arrowhead, Region Five, and East Central—experienced lower rates of increase in total earnings from 1970 to 1975 than the dominantly or heavily agricultural regions. The estimated increases in total earnings in current dollars are summarized, by region, as follows:

Region	Estimated		Annual rate
	1970	1975	
	(mil. \$)	(mil. \$)	(%)
Headwaters	78.7	124.7	9.6
Arrowhead	848.1	1,297.3	8.9
Region Five	192.6	305.4	9.7
East Central	119.1	195.9	10.5
Total or average	1,238.5	1,923.3	9.2

The reported increase in total earnings of the employed work force in the Arrowhead Region was due, in part, to the sharp increase in earnings per worker in manufacturing.

Real earnings are projected to increase faster in the four transitional primary resource-industrial regions than in most of the dominantly and heavily agricultural regions. Total real earnings are projected to increase by

\$2,158 million from 1970 to 2000—up 197 percent from the \$1,095.8 million in 1970. Regional differences in the estimates and projected increases are as follows:

Region	Estimated		Projected	Annual rate	
	1970	1975	2000	1970-1975	1970-2000
	(mil. \$)	(mil. \$)	(mil. \$)	(%)	(%)
Headwaters	69.6	81.7	253.0	3.3	4.4
Arrowhead	750.4	850.6	1,915.7	2.5	3.2
Region Five	170.4	200.2	561.1	3.3	4.1
East Central	105.4	128.4	524.0	4.0	5.5
Total or average	1,095.8	1,260.9	3,253.8	2.8	3.7

Reported 1970 to 1975 annual rates of increase in total earnings were smaller than the projected 1970 to 2000 increases in each of the four regions. In two of the three regions, large increases in population and employment also were reported. Total population declined in the Arrowhead Region in both the estimated and the projected series.

Reduced dependence on primary resource-related industry in the four regions is indicated by the trends in total earnings in agriculture and mining. The reported total earnings increase from 1970 to 1975 was 8 percent, up \$14.3 million from \$172.9 in 1970. The projected total earnings increase from 1970 to 2000 is only 15 percent, up \$25.4 million from 1970. Thus, over one-half of the projected increase in total earnings from 1970 to 2000 in these two industries was achieved in the first five-year period.

Region	Estimated		Projected		Annual rate	
	1970	1975	1980	2000	1970-1975	1970-2000
	(mil. \$)	(mil. \$)	(mil. \$)	(mil. \$)	(%)	(%)
Headwaters	8.6	7.0	4.0	4.7	-4.0	-2.0
Arrowhead	120.8	132.2	133.0	155.8	1.8	0.9
Region Five	24.5	30.6	15.3	17.6	4.5	-1.1
East Central	19.0	17.4	13.0	20.2	-1.7	0.2
Total or average	172.9	187.2	165.3	198.3	1.6	0.5

While dependence on primary resource-related industry is declining, dependence on trade and service industries is increasing. The growing importance of manufacturing also is projected, as indicated by the following increases in total real earnings in manufacturing:

Region	Estimated		Projected		Annual rate	
	1970	1975	1980	2000	1970-1975	1970-2000
	(mil. \$)	(mil. \$)	(mil. \$)	(mil. \$)	(%)	(%)
Headwaters	4.9	4.7	8.5	21.0	-0.8	5.0
Arrowhead	136.3	124.4	148.5	249.2	-1.8	2.0
Region Five	26.2	30.5	44.8	90.5	3.1	4.2
East Central	13.3	21.1	27.6	82.5	9.7	6.3
Total or average	180.7	180.7	229.4	413.2	0	3.0

Manufacturing is projected to double and even quadruple in total earnings in the four regions. However, the reported increases in total earnings failed to match the projected trends. The adverse effects of the downturn in manufacturing activity in 1975 were more severe in two of the regions than elsewhere in the state.

Dominantly urban-industrial region

Total earnings in the Metropolitan Council Region increased less rapidly than in the rest of the state, largely because of the decline in manufacturing and

the increase in agricultural activity which occurred in the latter part of the 1970 to 1975 period. The distribution of total earnings and the change in total earnings for the 1970 to 1975 period between the Metropolitan Council Region and the rest of state is summarized, in current dollars, as follows:

Region	Estimated		Annual
	1970	1975	rate
	(mil. \$)	(mil. \$)	(%)
Metropolitan Council	7,342.0	10,532.4	7.5
Rest-of-state	4,467.8	7,163.1	9.9
Total or average	11,809.9	17,695.5	8.4

The rate of change in real earnings from 1970 to 1975 was only 35 percent of the projected 1970 to 2000 change for the Metropolitan Council Region. For the rest of state the reported change was 95 percent of the projected 1970 to 2000 annual rate. This averages out to a statewide annual rate of change in 1970 to 1975 which is 84 percent of the projected 1970 to 2000 rate, as follows:

Region	Estimated		Projected	Annual rate	
	1970	1975	2000	1970-1975	1970-2000
	(mil. \$)	(mil. \$)	(mil. \$)	(%)	(%)
Metropolitan Council	6,497.3	6,906.4	17,830.6	1.2	3.4
Rest-of-state	3,963.0	4,696.3	11,910.9	3.5	3.7
Total or average	10,450.3	11,602.7	29,741.5	2.1	3.5

The overall pattern of growth of economic activity in the 1970 to 1975 period is illustrated by the reported changes in total earnings of the employed work force in manufacturing, trade, and services industries in the Metropolitan Council Region and the rest of state. Total real earnings in manufacturing increased only 2 percent in the Metropolitan Region and only 10 percent in the rest of state from 1970 to 1975. The 1970 to 1975 annual rates of increase were less than 50 percent of the projected 1970 to 2000 rates of increase. The increases are as follows:

Region	Estimated		Projected		Annual rate	
	1970	1975	1980	2000	1970-1975	1970-2000
	(mil.\$)	(mil. \$)	(mil. \$)	(mil. \$)	(%)	(%)
Metropolitan Council	1,880.6	1,916.8	2,682.1	4,539.1	0.4	3.0
Rest-of-state	736.2	809.6	1,181.4	2,237.2	1.9	3.8
Total or average	2,616.8	2,726.4	3,800.5	6,776.3	0.8	3.2

Total real earnings in the trade industries in the Metropolitan Council Region increased 7 percent from 1970 to 1975—roughly one-third the increase for the rest of state. The reported rate of increase again was much less than the projected 1970 to 2000 rate of increase for the Metropolitan Council Region. The two-region distributions of the reported and projected increases are as follows:

Region	Estimated		Projected		Annual rate	
	1970	1975	1980	2000	1970-1975	1970-2000
	(mil. \$)	(mil. \$)	(mil. \$)	(mil. \$)	(%)	(%)
Metropolitan Council	1,321.1	1,415.9	1,776.9	3,046.6	1.4	2.8
Rest-of-state	606.6	741.6	930.6	1,835.7	4.1	3.8
Total or average	1,927.7	2,157.5	2,707.5	4,882.3	2.3	3.1

All other industries—agriculture, mining, transportation, utilities and communications, finance, insurance and real estate, services, and government—are grouped together for the Metropolitan Council Region simply to illustrate the overall effects of abnormal levels of earnings in agriculture and manufacturing on total earnings. During the 1970 to 1975 period, total real earnings in the other industries increased 9 percent in the Metropolitan Council Region and 20 percent in rest of state. The large increase in the rest of state is due to the regional increases in agriculture and manufacturing earnings. The estimated and projected increases are summarized as follows:

Region	Estimated		Projected		Annual rate	
	1970 (mil. \$)	1975 (mil. \$)	1980 (mil. \$)	2000 (mil. \$)	1970-1975 (%)	1970-2000 (%)
Metropolitan Council	3,295.6	3,573.7	5,235.2	10,252.7	1.6	3.9
Rest-of-state	2,610.2	3,135.1	3,765.9	7,832.2	3.7	3.7
Total or average	5,905.8	6,718.8	9,001.1	18,082.9	2.6	3.8

Total earnings trends in the three industry groups are presented for the two periods to illustrate deviation from projected trends. Two principal events account for these deviations—the slowdown in general economic activity from 1974 to 1975 and the upsurge in farm prices and income in 1973 which helped sustain total earnings in dominantly and heavily agricultural regions to 1975. Thus, a shift in economic activity from the Metropolitan Council Region to the rest of state is suggested by recent trends. Total earnings in the Metropolitan Council Region may increase more rapidly than in the rest of state as farm prices decline and general economic conditions improve.

The Metropolitan Council Region's share of the total earnings of the employed work force is projected at a slightly increasing level in manufacturing and trade, and a more sharply increasing level in services and other industries. Because of the events of 1973 and 1974, this region's share of total earnings declined below projected levels for each of the three industry groups.

Total Personal Income

Total earnings are the major source of total personal income payments. Interest, dividends, and rent, which are property income, and transfer payments are the remaining personal income sources. While earnings are reported by place of work or place of residence, property income and transfer payments are reported only by place of residence.

Use of the multi-county development region for reporting total personal income trends and projections helps reduce the gap between earnings reported by place of work and earnings reported by place of residence. Much of the county-to-county commuting is internal to the development region. For large population centers, however, the commuting area, or labor shed, extends beyond the development region boundaries and, hence, the two methods of reporting net earnings yield different results from region to region and year to year.

In the presentation of personal income trends and projections in this report, place-to-place and period-to-period variations in personal income are reported for (1) total personal income of Minnesota residents and (2) the substate regional distribution of total personal income. Income differences between regions are related to industry employment and earnings per worker levels in each substate region.

Total Personal Income of Residents

The major sources of total personal income differ only slightly for the state and the nation (Table 3.1). Changes in each major income source in Minnesota were slightly larger than the nation during the 1970 to 1975 period. Minnesota total personal income increased from 1.8 percent of U.S. total personal income in 1970 to 1.9 percent of this total in 1975.

Total earnings are a larger proportion of total personal income in Minnesota than in the U.S. because of an adjustment for in-commuting, a slightly lower level of property income and transfer payments, and a slightly lower unemployment rate.

The approximately \$40 million residence adjustment reduced total personal income by 0.3 percent in 1970 and 0.2 percent in 1975. Property income and transfer payments as a proportion of total income were lower in Minnesota than the U.S. by 5 percent in 1970 and by 9 percent in 1975. The proportions of Minnesota and U.S. total income derived from each source are as follows:

Income source	Minnesota		U.S.	
	1970	1975	1970	1975
	(percent)			
Total earnings	80.2	77.5	79.3	75.6
Personal contributions	-3.3	-4.3	-3.3	-3.9
Residence adjustment	-0.3	-0.2	0	0
Property income	14.0	14.4	14.4	14.5
Transfer payments	9.4	12.6	9.8	13.8
Total	100.0	100.0	100.0	100.0

A large increase in the rate of personal contributions of the employed work force (for unemployment insurance and retirement programs) further reduced Minnesota personal income levels relative to the U.S. levels.

Projected Minnesota and U.S. income levels continue historical trends and relationships. Both earnings per worker and personal income per capita in Minnesota approach the U.S. average levels in the 1980's. For both the state and the nation the total of property income and transfer payments is projected to increase as a proportion of total personal income.

Substate Distribution of Total Personal Income

The substate regional distribution of total personal income in 1970 and 1975 is derived from the county-level estimates reported by the U.S. Department of Commerce in its Regional Economic Information System. The substate distribution of income sources includes a residence adjustment for net in-commuting or out-commuting of the employed work force (Table 3.2).

Table 3.1. Estimated and projected total personal income per person (in 1967 dollars), by income source, Minnesota and U.S., 1950-2000.

Year	Minnesota				United States			
	Earnings ¹		Property income and transfer payments ²	Total personal income	Earnings ¹		Property income and transfer payments ²	Total personal income
	Total	Farm			Total	Farm		
	(dollars)							
Estimated: ³								
1950	1,604	269	338	1,942	1,703	155	361	2,064
1959	1,823	148	444	2,267	2,015	90	437	2,452
1962	1,901	145	507	2,414	2,111	99	486	2,597
1967	2,452	174	545	2,997	2,571	89	617	3,188
1969	2,684	169	570	3,254	2,787	92	671	3,458
1970	2,740	205	675	3,415	2,783	88	727	3,510
1971	2,716	172	721	3,437	2,778	85	792	3,570
1972	2,849	203	734	3,583	2,958	98	798	3,756
1973	3,253	478	756	4,009	3,123	152	837	3,960
1974	3,085	332	813	3,898	3,035	118	875	3,910
1975	2,956	247	858	3,814	2,927	104	944	3,871
Projected: ⁴								
1980	3,804	182	986	4,790	3,743	95	1,033	4,780
1985	4,303	182	1,151	5,454	4,233	94	1,196	5,429
1990	4,879	181	1,332	6,211	4,783	94	1,384	6,146
2000	6,392	191	1,818	8,210	6,282	98	1,884	8,165

¹Earnings are given by place of work and, hence, are not adjusted for residence.

²Personal contributions and residence adjustment are not included.

³Based on data in Table 1.1.

⁴U.S. Water Resources Council, 1972 *OBERS Projections*. Minnesota earnings projections are adjusted to current state population projections.

Table 3.2. Estimated personal income (in 1967 dollars) per person in Minnesota, by region, 1970 and 1975¹.

Income source and year	North-	Head-	Arrow-	West	Region	Six	Six	East	Central	Central	South-	Region	South-	Metro-	Total
	west	waters	head	Central	Five	East	West	Central	Minne-	west	Nine	eastern	politan		
	1	2	3	4	5	6E	6W	7E	7W	8	9	10	11		
	(dollars)														
1970:															
Net earnings, by work	1,880	1,216	2,171	1,605	1,434	2,115	1,878	1,322	1,692	2,055	2,128	2,354	3,305	2,625	
Residence adjustment	98	18	-34	158	23	61	7	675	327	1	41	51	-112	-9	
Net earnings, by residence	1,978	1,234	2,137	1,763	1,457	2,176	1,885	1,997	2,019	2,056	2,169	2,405	3,193	2,616	
Property income	335	248	368	373	340	453	426	354	341	482	510	478	550	480	
Transfer payments	344	378	385	331	402	329	341	384	287	304	303	296	305	319	
Total personal income	2,657	1,859	2,890	2,467	2,199	2,958	2,652	2,735	2,647	2,842	2,981	3,181	4,048	3,415	
1975:															
Net earnings, by work	2,365	1,285	2,429	1,878	1,529	2,656	2,422	1,346	1,844	2,392	2,616	2,537	3,379	2,790	
Residence adjustment	113	16	-50	193	25	33	11	643	436	0	44	61	-127	-7	
Net earnings, by residence	2,478	1,301	2,379	2,071	1,354	2,689	2,433	1,989	2,280	2,392	2,660	2,598	3,252	2,783	
Property income	420	302	429	464	393	450	544	359	376	592	607	549	619	549	
Transfer payments	486	548	581	483	581	472	496	527	415	442	459	452	473	482	
Total personal income	3,384	2,151	3,389	3,018	2,528	3,711	3,473	2,875	3,071	3,426	3,726	3,599	4,344	3,814	

¹Based on data in: U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Economic Information System*, 1977.

More than one-half of the total earnings in the state originate in the Metropolitan Council Region and more than one-half of the total personal income payments are received by residents of the Metropolitan Council Region. In 1970, the two percentages were 62.2 and 58.4, respectively. By 1975, however, they declined to 59.5 and 55.7, respectively. This decline was the outcome of a large decline in manufacturing employment, which was concentrated in the Metropolitan Council Region, and a large increase in farm income, which occurred throughout the state.

The regional distribution of total personal income depends on the regional distribution of (1) the em-

ployed work force, (2) earnings per worker, and (3) total property income and transfer payments. The total employed work force, in turn, depends on labor force participation, the number in the total population of working age, and commuting levels. Labor force participation rates, total population change, earnings per worker, and total property income are high in the Metropolitan Council Region. Total personal income per person was 15 percent above the U.S. average in 1970 and 12 percent above this average in 1975. Total earnings per worker also were above the U.S. average. In the remaining 12 substate regions, both personal income per person and earnings per worker were below

the U.S. averages in 1970 and 1975.

Property income and transfer payments per person vary more than total personal income. In 1970 and 1975, they ranged from 49 percent to 112 percent of the U.S. averages. For some regions, property income payments per person increased more rapidly than for the U.S. However, transfer payments per person, which averaged higher relative to the U.S. than property income payments, declined slightly from 1970 to 1975 relative to the U.S. averages.¹¹ Transfer payments were inversely correlated with the level of property income payments.

The county-by-county distribution of relative income levels is used as a measure of economic well-being in substate regions. In 1970, per capita income levels exceeded the U.S. average in only six of 87 counties (Figure 3.1). Five of the high-income counties were in or near the Metropolitan Council Region. In 23 counties, per capita income levels were less than 70 percent of the U.S. average. All but two of the low-income counties were in the six northern and western Minnesota regions.

By 1975, per capita income levels had surged ahead in dominantly agricultural areas. High farm prices in 1973, 1974, and 1975 lifted relative income in southern and western counties. The number of counties with relative income levels of 100 percent or more of the U.S. average increased from six to 13 in the five-year period. Meanwhile, counties with relative income levels less than 70 percent of the U.S. average dropped from 22 to 13. Low income levels persisted, however, among northern Minnesota counties.

Per capita income levels, when used in ranking Minnesota development regions, from lowest to highest, show the largest income differentials for the most rural regions of the state. These rankings, from largest negative to largest positive income differential, are as follows:

Region	Rank	
	1970	1975
Headwaters	1	1
Region Five	2	2
West Central	3	4
Central Minnesota	4	5
Upper Minnesota Valley	5	9
Northwest	6	6
East Central	7	3
Southwest	8	8
Arrowhead	9	7
Six East	10	10
Region Nine	11	12
Southeastern	12	11
Metropolitan Council	13	13

The geographic concentration of low income levels in the northern and western regions and of high incomes in the core metropolitan region and the southern agricultural regions is confirmed by the level of total earnings and property income per person in 1970 and 1975. Transfer payments per person were compensatory insofar as they helped reduce the regional income imbalances resulting from large differences in total earnings and property income.

Personal income trends in substate regions converged towards the state average in 1970 and 1975. Estimated per capita income levels ranged from 54 percent to 118 percent of the state average in 1970 and from 56 percent to 114 percent of the state average in 1975. The state average meanwhile was approaching the U.S. average.

Convergence of per capita income trends and dispersion of population growth would result in a corresponding dispersion of the growth in total personal income. However, a decreasing share of total personal income is projected for outstate regions in the 1972 OBERS projections. In the new projection series based on the current population projection for the state, relative income levels in Minnesota converge towards the U.S. average while total income levels are projected to increase at approximately the same rate in the Metropolitan Council Region as in the rapidly-urbanizing outstate regions (Table 3.3).

The reported 1970 to 1975 trends differ from the projected 1970 to 2000 trends, because of the (1) above-average total earnings in agriculture in 1973 and 1974 and (2) below-average total earnings in manufacturing in 1975. Economic growth in the Metropolitan Council Region thus lagged in relation to the rest of state in the 1970 to 1975 period. The projected increasing income share earned in the Metropolitan Council Region is based on anticipated projected employment expansion in industries with above-average earnings per worker and in property income.

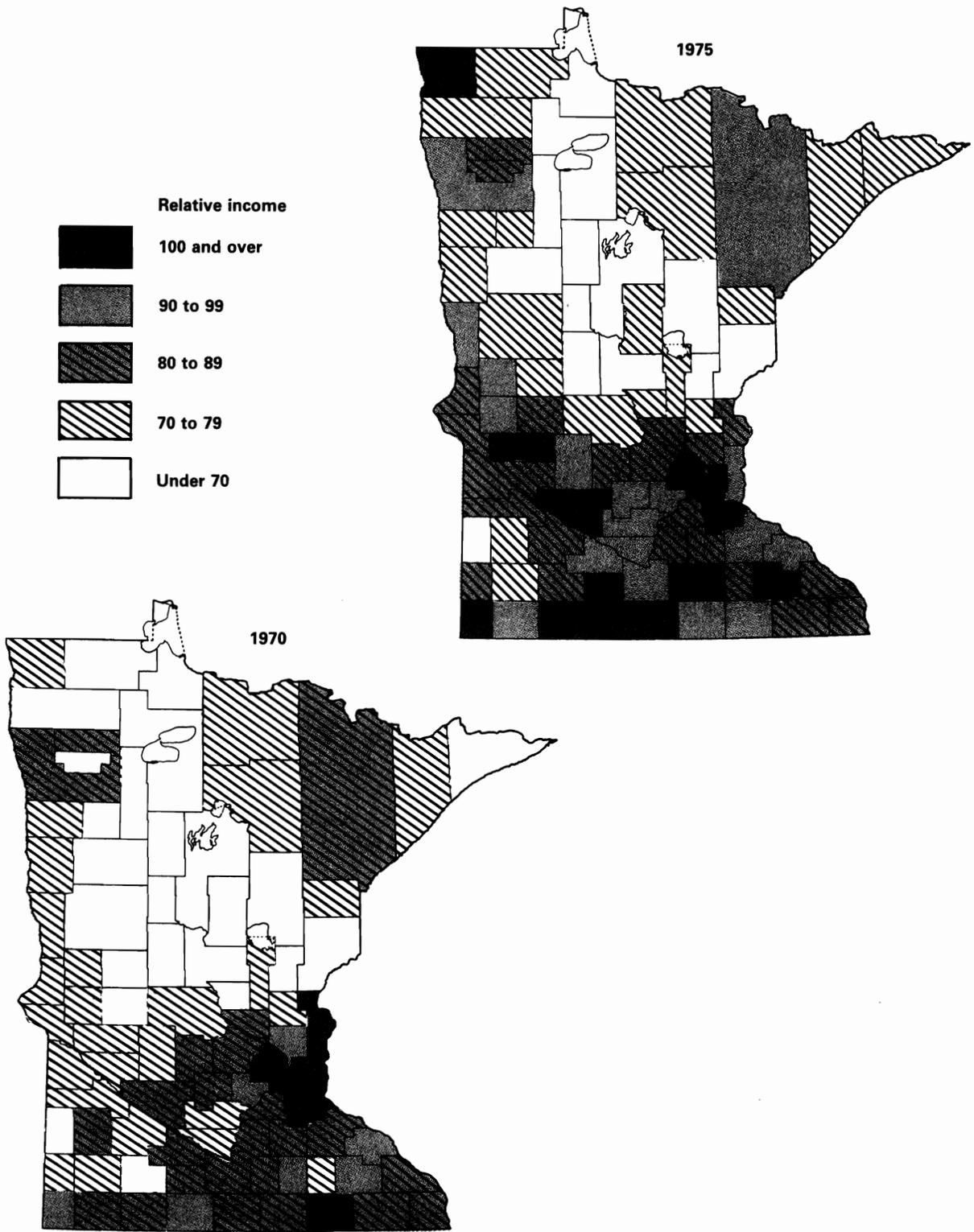
While the 1972 OBERS projections noted earlier show increasing concentration of total personal income payments in the metropolitan core region for the post-1975 period, the new population-based projections compare more closely with recent trends. The percentage distribution of total personal income payments in 1970, 1975, and 2000 in the four regional groupings are as follows:

	Estimated		Projected 2000	
	1970	1975	OBERS	New
	(percent)			
Dominantly agricultural regions	9.8	10.7	7.6	8.9
Transitional agricultural-industrial regions	20.2	21.5	18.6	22.0
Transitional primary resource-industrial regions	11.6	12.1	9.2	11.7
Urban-industrial region	58.4	55.7	64.6	57.4
Total	100.0	100.0	100.0	100.0

¹¹Transfer income included specific income payments as follows:

Type of payment	1970	1975
	(percent)	
Retirement and disability programs	63.4	57.6
Civilian	53.9	50.9
Military	9.5	6.7
Unemployment insurance programs	4.3	8.9
Medical assistance	11.4	11.4
Educational assistance	3.2	4.1
Public assistance	9.8	9.4
Other transfers	7.9	8.6
Total	100.0	100.0

Figure 3.1 Estimated total personal income per person as a percent of U.S. average, by county, Minnesota, 1970 and 1975.



Source: Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C., 1977.

Table 3.3 Estimated and projected total personal income (in 1967 dollars) in specified region, Minnesota, 1970-2000.

Region Number Title	Estimated ¹		Projected ²			
	1970	1975	1980	1985	1990	2000
	(mil. \$)					
1. Northwest	252.0	328.4	327.0	386.3	451.2	613.5
2. Headwaters	101.8	129.2	139.2	170.5	206.1	308.3
3. Arrowhead	955.0	1,115.0	1,371.0	1,590.2	1,836.3	2,454.7
4. West Central	458.6	578.7	642.2	767.0	904.8	1,269.0
5. Region Five	250.5	314.0	368.7	466.3	536.2	777.8
6E. Six East	291.0	380.1	455.8	553.1	665.4	957.1
6W. Upper Minnesota Valley	164.6	212.7	240.2	277.5	316.8	405.5
7E. East Central	209.3	259.8	330.3	431.6	561.3	941.4
7W. Central Minnesota	460.5	606.0	754.6	963.1	1,227.4	1,953.2
8. Southwest	403.4	481.8	631.1	734.2	850.1	1,109.5
9. Region Nine	651.9	811.8	972.6	1,152.3	1,352.3	1,858.3
10. Southeastern	1,222.7	1,417.2	1,807.3	2,167.4	2,575.9	3,616.7
11. Metropolitan Council	7,606.4	8,339.1	11,486.8	13,553.1	15,977.9	21,936.1
State	13,027.7	14,973.8	19,526.9	23,192.7	27,461.6	38,201.0

¹Based on unpublished data from the Regional Economic Information System (REIS), Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C., 1977.

²Based on total earnings projections in: U.S. Water Resources Council, 1972 *OBERS Projections, Regional Economic Activity in the United States, Series E Population*, U.S. Government Printing Office, Washington, D.C., April, 1974.

Table 3.4. Estimated and projected change in specified dependent variable by change source, Minnesota, 1970-1975 and 1970-2000¹

Description	Change due to specific explanatory variable						Combina- tion effects
	Total change	Popu- lation	Employed work force participation	Earnings per worker	Property income per person	Transfer payments per person	
	(mil. \$)						
1970-1975 (current dollars):							
Total earnings ²	5,886	291	1,147	3,931	0	0	517
Less: Personal contribution and residence adjustment ³	500	25	97	334	0	0	44
Property income ⁴	1,218	51	0	0	1,139	0	28
Transfer payments ⁵	1,510	34	0	0	0	1,440	36
Total personal income ⁶	8,114	351	1,050	3,597	1,139	1,440	537
1970-1975 (1967 dollars):							
Total earnings	1,152	258	1,012	-128	0	0	10
Less: Personal contribution and residence adjustment	206	46	181	-23	0	0	2
Property income	325	45	0	0	273	0	7
Transfer payments	675	30	0	0	0	630	15
Total personal income	1,946	287	831	-105	273	630	30
1970-2000 (1967 dollars):							
Total earnings	19,290	2,295	1,807	10,340		0	4,848
Property income and transfer payments ⁷	5,883	566	0	0	4,361		956
Total personal income	25,173	2,861	1,807	10,340	4,361		5,904

¹Based on data in Tables 1.1 and 3.1.

²Change in total earnings, $\Delta\text{earn} = \Delta\text{pop} * \text{emp}_{c70} * \text{earn}_{c70} + \Delta\text{emp} * \text{pop}_{70} * \text{earn}_{c70} + \Delta\text{earn} * \text{pop}_{70} * \text{emp}_{c70} + \Delta\text{pop} * \Delta\text{emp} * \text{earn}_{c70} + \Delta\text{emp} * \Delta\text{earn}$.

³Change in personal contributions and residence adjustment, $\Delta\text{percon} = \Delta\text{earn} * \text{percon}_{c70}$.

⁴Change in property income, $\Delta\text{prop} = \Delta\text{pop} * \text{prop}_{c70} + \Delta\text{prop} * \text{pop}_{70} + \Delta\text{pop} * \Delta\text{prop}$.

⁵Change in transfer payments, $\Delta\text{tran} = \Delta\text{pop} * \text{tranc}_{70} + \text{tranc} * \text{pop}_{70} + \Delta\text{pop} * \Delta\text{tranc}$.

⁶Change in total personal income, $\Delta\text{pers} = \Delta\text{earn} + \Delta\text{percon} + \Delta\text{prop} + \Delta\text{tran}$.

⁷Includes personal contributions and residence adjustments.

Estimated and projected income levels for the 1970 to 2000 period are related here to changes in population, employed work force per person, earnings per worker, personal contribution, and residence adjustment per worker, property income per person, and transfer payments per person (Table 3.4). A six-equation model accounts for the total income of Minnesota residents in terms of five income sources, plus the combined affects of two or more of these sources.¹²

The accounting model is used simply to summarize the study findings on the components of personal income and their relationship to selected explanatory variables. The findings use the two sets of data—the one in current dollars, the other in constant dollars—for the 1970 to 1975 period. The projected income levels are shown only in constant dollars.

The findings show that the increase in earnings per worker accounted for the largest portion of the total change in personal income—44 percent—from 1970 to 1975. Increases due to higher levels of employed work force participation and per capita property income and transfer payments ranged from 13 percent to 18 percent of the total, while population growth accounted for only 4 percent of the increase in monetary personal income.

The increase in real personal income in the 1970 to 1975 period was due largely to the increase in employed work force participation and per capita transfer payments, which accounted for 75 percent of total increase. For the 1970-2000 period, however, most of the projected increase is due to an increase in (1) earnings per worker and (2) property income and transfer payments per person.

Income Change Source

Two sources of income change are identified—the changing industry distribution of employment and the changing level of income payments per worker. In this chapter, trends and projections of industry employment and earnings per worker in the U.S. are discussed. Corresponding industry employment and earnings estimates and projections for Minnesota are examined, also.

¹²This model is of the form,

$$\begin{aligned} \text{emp} &= \text{empc} * \text{pop} \\ \text{earn} &= \text{earnc} * \text{emp} \\ \text{percon} &= \text{perconc} * \text{earn} \\ \text{prop} &= \text{propc} * \text{pop} \\ \text{tran} &= \text{tranc} * \text{pop} \\ \text{pers} &= \text{earn} + \text{prop} + \text{tran}, \end{aligned}$$

where

$$\begin{aligned} \text{emp} &= \text{total employed work force} \\ \text{pop} &= \text{total population} \\ \text{earn} &= \text{total earnings} \\ \text{percon} &= \text{total personal contributions} \\ \text{prop} &= \text{total property income} \\ \text{tran} &= \text{total transfer payments} \\ \text{pers} &= \text{total personal income} \\ \text{empc} &= \text{employed work force per person} \\ \text{earnc} &= \text{earnings per worker} \\ \text{perconc} &= \text{personal contributions per worker} \\ \text{propc} &= \text{property income per person} \\ \text{tranc} &= \text{transfer payments per person} \end{aligned}$$

The derived total change in each dependent variable is attributed entirely to changes in the explanatory variables in the six equations, as shown in Table 3.4.

Industry Distribution of Employment

The employed work force series presented in this report is based on the annual REIS series cited earlier. This series is comparable with the Bureau of Labor Statistics employed work force projections to 1985¹³ and the income projections prepared for the U.S. Water Resources Council.¹⁴

The U.S. employed work force projections are based on the Series E population projections published by the U.S. Bureau of the Census. The Series E population projections show a projected population of 263,830,000 in the year 2000.¹⁵ This compares closely with the currently used Series II projected population of 260,378,000 for 2000.¹⁶

The 25 industry breakdown (which collapses into the 11 industries in this report) is used in the reporting of OBERS income projection series. In this series, employment is based on jobs and reported by place of work under the Unemployment Insurance Program. All government employment is compiled separately from private employment.

Two steps are involved in the preparation of the Minnesota employed work force series. First, the REIS total employed work force estimates are prepared for the 11-industry breakdown used in the REIS reporting format. Wage and salary employment is reported for each industry. Proprietorial employment, however, is reported in two categories—farm and non-farm. Non-farm proprietors are distributed among the seven non-farm private industry groups by use of the employment ratios derived from the corresponding U.S. employment series.

U.S. and Minnesota employment trends

The U.S. employed work force is projected to increase from 85,646,000 in 1970 to 126,338,000 in 2000—an annual increase of 1.3 percent over the 30-year period. For selected periods, the annual rates of increase in the employed work force, employed work force participation rates and total population, are as follows:

Period	Total employed work force	Employed work force participation	Total population
		(percent)	
1970-1975	1.2	0.3	0.9
1970-1980	1.9	1.0	0.9
1980-1985	1.0	0.1	0.9
1985-1990	1.0	0.1	1.0
1990-2000	1.1	0.3	0.7

¹³U.S. Bureau of Labor Statistics, *The U.S. in 1985: A Summary of BLS Projections*, Bulletin 1980, U.S. Government Printing Office, Washington, D.C., 1974.

¹⁴U.S. Water Resources Council, *1972 OBERS Projections, Vol. I, Concepts, Methodology and Summary Data*, U.S. Government Printing Office, Washington, D.C., 1974.

¹⁵U.S. Bureau of the Census, *Current Population Reports, Series P-25, No. 601, "Projections of the Population of the United States: 1975 to 2050"*, U.S. Government Printing Office, Washington, D.C., 1975.

¹⁶U.S. Bureau of the Census, *Current Population Reports, Series P-25, No. 704, "Projections of the Population of the United States: 1977 to 2050"*, U.S. Government Printing Office, Washington, D.C., 1977.

The employed work force is expected to expand more rapidly than population, especially in the early years of the 30-year period, because of increasing proportion of the total population in the employed work force. In the 1970 to 1975 period this participation was low because of high unemployment.

Differential rates of change in industry employment are attributed to changes in demand, output per worker, labor force participation rates, and population. For industries with above-average projected growth in employment—construction, paper products, printing and publishing, chemicals and allied products, fabricated metals products, electrical machinery, finance, insurance and real estate, and private services—the expected demand increases are larger than the expected output per worker increases. For industries with below-average projected growth in employment—agriculture, mining, food products, textile products, apparel, lumber and furniture, petroleum refining, primary metal products, machinery, except electrical, motor vehicles, transportation equipment, miscellaneous manufacturing, transportation, communications and utilities, wholesale and retail trade, federal government, and military—the expected demand increases are less than the expected increases in output per worker. The latter include both the industries lagging in demand expansion and the industries experiencing rapid expansion in output per worker.¹⁷

The Minnesota employed work force is projected to increase 43 percent in 30 years (Table 4.1) from 1.6 million in 1970 to 2.3 million in 2000. Total population is projected to increase less than 30 percent from 3.8 million in 1970 to 4.9 million in 2000. The employed labor force is projected to increase 44 percent from 1.5 million in 1970 to 2.2 million in 2000.

The employed work force is expected to increase more rapidly than population in Minnesota because of expected large increases in employed work force par-

ticipation rates. Until 1980, the increase in employed work force participation rates accounts for most of the growth in total employed labor force. In the post-1980 period, however, population growth in the 1972 OBERS projections is a major source of change in total work force, as shown below:

Period	Total employed work force	Labor force participation (percent)	Total population
1970-1975	2.5	1.9	0.5
1970-1980	2.0	1.2	0.8
1980-1985	1.1	0.1	1.0
1985-1990	1.1	0.1	1.0
1990-2000	1.0	0.3	0.7

The employed work force projections differ from the employed labor force projections in the related study cited earlier because of (1) a higher total population projection in the 1972 OBERS projections than in the Minnesota State Planning Agency projections and (2) a job-based rather than a person-based measure of employment. Both the OBERS projections and the REIS estimates cited earlier (see p. 6 and 16) are based on a job count rather than a household count of employed persons, as in the 1970 U.S. Census of Population and related reports. Multiple job-holding thus accounts for at least part of the difference in the two employment series, which are summarized as follows:¹⁸

	1970	1980	1990	2000
	(thousand)			
<u>This study:</u>				
Employed work force, total	1,618	1,955	2,136	2,315
Agriculture	153	116	92	81
Non-agriculture	1,465	1,839	2,044	2,234
<u>Employment trends study:</u>				
Employed labor force, total	1,494	1,829	2,047	2,151
Agriculture	114	86	66	53
Non-agriculture	1,381	1,743	1,981	2,098

¹⁷For further discussion of relative output and labor productivity increases, see: U.S. Bureau of Labor Statistics, *op. cit.*

¹⁸Based on comparison of employed work force series with employed labor force series used in report by Maki, *et al.* (see p. 6).

Table 4.1. Estimated and projected total employment in specified industry, Minnesota, 1970-2000.

Industry Number Title	Estimated ¹		Projected ²			
	1970	1975	1980	1985	1990	2000
	(number)					
1. Agriculture, forestry, fishing	152,965	177,870	116,178	99,951	91,781	80,560
2. Mining	15,317	15,029	12,945	11,908	10,911	9,751
3. Construction	77,301	77,612	105,098	109,928	112,902	122,523
4. Manufacturing	319,928	316,682	378,029	395,210	406,918	431,710
5. Transportation, communications, utilities	87,137	93,499	98,191	98,191	101,515	109,599
6. Trade	361,294	425,578	440,475	440,475	475,029	514,155
7. Finance, insurance, real estate	69,500	82,274	92,735	102,735	110,538	129,111
8. Services	288,818	352,979	387,912	410,642	444,427	498,492
9. Federal government	31,823	29,849	31,206	32,238	34,945	37,203
10. State and local government	209,710	245,108	288,752	327,530	343,885	378,362
11. Military	4,295	2,586	3,315	3,255	3,201	3,147
12. Total	1,618,088	1,819,066	1,954,847	2,046,695	2,136,053	2,314,626

¹Based on unpublished data from the *Regional Economic Information System* (REIS), Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C., 1977.

²Based on total earnings projections (adjusted to current State population projections) in: U.S. Water Resources Council, *1972 OBERS Projections, Regional Economic Activity in the United States, Series E Population*, U.S. Government Printing Office, Washington, D.C., April, 1974.

Table 4.2 Estimated total employment change in specified industry, Minnesota, 1970-1975¹

Industry Number	Title	Head- waters 1	North- west 2	Arrow- head 3	West Central 4	Region Five 5	Six East 6E	Upper Minn. Valley 6W	East Central 7E	Central Minnesota 7W	South- west 8	Region Nine 9	South- east 10	Metro- politan Council 11	State
(thousand)															
1.	Agriculture, forestry, fishing	3.5	.4	.3	2.9	.7	1.6	1.1	.6	1.4	2.5	2.6	4.1	3.1	24.9
2.	Mining	²	²	.6	.2	²	.2	²	²	.1	²	.1	-1.6	²	-.3
3.	Construction	.1	²	2.8	.4	.1	.5	.3	.4	.5	.5	1.0	1.2	-7.6	.3
4.	Manufacturing	-.5	-.1	-2.8	.4	.4	1.0	.1	1.1	2.6	²	1.5	2.4	-9.4	-3.2
5.	Transportation, communications, utilities	.3	.2	1.0	.7	.2	.1	.1	.1	.5	.3	.6	.7	1.6	5.4
6.	Trade	3.0	1.5	5.6	4.0	2.4	2.6	1.4	1.0	3.7	4.0	5.1	6.3	23.8	64.3
7.	Finance, insurance, real estate	.4	²	1.2	.5	.3	.3	.3	.2	.6	.5	.9	.8	6.9	12.8
8.	Services	.8	1.1	2.9	3.7	1.1	1.9	1.2	1.5	2.8	2.4	3.3	7.1	34.4	64.2
9.	Federal government	²	.1	-.1	²	²	²	²	²	.2	²	²	-.1	-1.9	-2.0
10.	State and local government	.6	.8	1.9	1.4	1.2	1.3	.3	1.0	2.5	1.0	1.8	3.7	18.1	35.4
11.	Military	²	²	-1.2	²	²	²	0	²	²	²	²	²	-.4	-1.7
Total		8.1	3.9	12.1	14.3	6.4	9.4	4.8	5.9	14.8	11.2	16.7	24.6	68.8	201.0

¹Based on unpublished data from the *Regional Economic Information System* (REIS), Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C., 1977.

²50 or less.

Thus, the two employment series differ in both agricultural and non-agricultural employment. The agricultural employment series converge as total farm employment declines while the non-agricultural employment diverge slightly as multiple job-holding is projected to increase.

Substate regional employment trends

Substate regional employment estimates from REIS (see p. 6) and the recent study by Maki, *et al.* (see p. 6) show a concentration of construction, selected manufacturing, and all non-commodity-producing employment, except state and local government, in the Metropolitan Council Region. Of the 15 manufacturing industries, nine are concentrated, in varying degree, in this region. The nine geographically concentrated manufacturing industries are: paper products, printing and publishing, chemical products, petroleum products, fabricated metals, machinery (except electrical), electrical machinery, motor vehicles, and miscellaneous manufacturing.

Shifts in the degree of industry concentration are shown in a comparison of 1970 and 1975 levels of industry employment in the state and regional distribution of the industry employment change from 1970 to 1975 (Table 4.2). Less geographic concentration in the Metropolitan Council Region is indicated for each one of the 11 major industry groups. A net shift towards out-state areas is strongly indicated, therefore, in the 1970 and 1975 employment comparisons.

Region-to-region differences in the employed work force in agriculture account, in part, for region-to-region differences in the non-agricultural employed work force. Agricultural employment is distributed widely in the state, although the eight heavily agricultural regions accounted for 120,000 of the 153,000 agricultural employed work force in 1970. By 1975, total agricultural employment increased to 139,700 in the

eight regions and 177,900 in the state. Total agricultural employment is projected to decline, however, to less than 72,000 in the eight regions and 84,700 in the state by 2000. These eight regions would account for nearly 85 percent of the total agricultural employed work force in the state.

Non-agricultural employment is concentrated in the Metropolitan Council Region. However, non-agricultural employment is projected to increase in each outstate region. The region-to-region distribution of this employment varies among the four regional groupings cited earlier (see p. 6).

Earnings Per Worker

Total earnings (*i.e.*, wage and salary payments and proprietorial income) estimates of the employed work force are compiled in the offices of both the U.S. Department of Labor and the U.S. Department of Commerce. The REIS earnings estimates and the OBERS earnings projections in this report, along with the employment series in Table 4.1, are used in deriving industry earnings per worker.

Comparison of year-to-year changes in individual and aggregate industry earnings requires conversion of the data series from current to constant dollars. The deflated earnings series show wide industry-to-industry differences in (1) base-year earnings and (2) annual change in earnings. Average earnings per worker based on the projected total earnings and total employed work force series in this report are projected to double in approximately 20 years. For some industries (*e.g.*, transportation equipment), however, the projected doubling rate is less than 20 years while for others (*e.g.*, trade) it is more than 20 years. Area-to-area differences in industry composition thus account for corresponding differences in total industry earnings.

U.S. and Minnesota earnings per worker trends

Total earnings per worker in Minnesota industries generally follow the U.S. industry-to-industry pattern (Table 4.3). Differences occur among industries, however, as a result of differences in industry composition and organization and the competitive position of those industries *vis a vis* product and factor markets. Use of U.S. average earnings per worker ratios for Minnesota would under or over-estimate total industry earnings with given levels of industry employment. Projected earnings per worker in Minnesota are based, nonetheless, on the corresponding U.S. projection series. The annual rates of change in the U.S. ratios are used with the Minnesota base-year (*i.e.*, 1970 and 1975) ratios in deriving the total earnings per worker series used in this report.

Use of an earnings per worker series, which is based on an employed work force series, means that the projected earnings per worker series underestimate the average earnings of employed persons. A low rate of growth in earnings per worker is due, at least in part, to an increase in part-time employment. Implicit in the earnings per worker projections is a reduction in total hours worked per year per person.

The reduction in work year varies from industry to industry and accounts, in part, for industry differences in annual rates of increase in earnings per worker.

Substate earnings per worker trends

Average earnings per worker will vary widely among substate regions because of region-to-region differences in industry-occupation mix. Region to region differences in earnings for the same mix of occupations and industries persist, however, because of local peculiarities in wage-level determination and employee preferences. Thus, in 1970, average earnings per worker ranged from 38 percent *below* to 13 percent *above* the state average (Table 4.4). This range was even greater in 1975. Personal contributions to social insurance programs correlated directly with earnings and, hence, the rate in net earnings per worker was slightly less than total earnings per worker in 1970 and 1975. The spread in average earnings was ameliorated further by commuting of the resident labor force from a low earnings region to work places outside the region, as in the Headwaters Region.

Total personal income earned outside the region by resident labor force increased (in current dollars)

Table 4.3. Estimated and projected earnings per worker (in 1967 dollars) in specified industry, Minnesota, 1970-2000.

Industry Number Title	Estimated		Projected			
	1970	1975	1980	1985	1990	2000
	(dollars)					
1. Agriculture, forestry, fishing	5,265	5,586	6,396	7,736	8,740	11,036
2. Mining	8,673	10,111	11,329	12,739	14,329	17,673
3. Construction	9,207	8,551	10,189	11,318	12,765	15,609
4. Manufacturing	8,203	8,646	10,053	11,164	12,577	15,696
5. Transportation, communications, utilities	8,599	9,265	11,010	12,799	14,322	17,808
6. Trade	5,335	5,069	6,147	6,894	7,641	9,496
7. Finance, insurance, real estate	7,462	6,978	5,118	10,053	11,293	14,011
8. Services	5,104	4,742	6,999	8,226	9,426	12,603
9. Federal government, civilian	8,254	9,591	12,477	14,531	16,076	20,980
10. State and local government	5,597	5,868	6,709	7,221	8,371	11,040
11. Military ¹	16,564	23,341	21,750	24,554	27,607	34,453
Average	6,459	6,379	7,934	8,941	10,099	12,849

¹Includes income payments to families of military personnel.

Table 4.4. Estimated income payments (in 1967 dollars) per person in employed work force in Minnesota, by region, 1970 and 1975.¹

Income source and year	North-	Head-	Arrow-	West	Region	Six	Six	East	Central	Central	South-	Region	South-	Metro-	Total
	west	waters	head	Central	Five	East	West	Central	Minne-	west	Nine	eastern	politan		
	1	2	3	4	5	6E	6W	7E	7W	8	9	10	11		
	(dollars)														
1970:															
Total earnings, by work	4,690	4,028	6,256	4,648	4,433	5,372	5,020	4,093	5,214	5,587	5,538	5,939	7,305	7,305	6,459
Personal contributions	-155	-179	-277	-166	-187	-181	-144	-162	-204	-155	-189	-227	-321	-321	-268
Net earnings, by work	4,535	3,850	5,979	4,481	4,246	5,191	4,875	3,930	5,010	5,432	5,349	5,712	3,444	3,444	6,191
Residence adjustment	236	91	-91	442	134	148	19	2,004	967	2	101	125	-237	-237	-22
1975:															
Total earnings, by work	5,028	3,865	6,441	4,667	4,463	5,739	5,355	4,124	5,204	5,388	5,746	5,762	7,207	7,207	6,379
Personal contributions	-187	-217	-390	-210	-232	-245	-183	-217	-261	-199	-252	-301	-439	-439	-357
Net earnings, by work	4,841	3,648	6,052	4,456	4,231	5,494	5,172	3,907	4,943	5,189	5,494	5,461	6,769	6,769	6,022
Residence adjustment	232	47	-125	458	70	74	23	1,873	1,170	0	92	131	-254	-254	-14

¹Based on data in: U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Economic Information System*, 1977.

between 1970 and 1975 in seven of the 11 regions. The positive residence adjustment denotes out-commuting and, hence, a higher net earnings by place of residence than by place of work. Net increases in out-commuting are indicated for only four regions in Table 4.4, namely, West Central, Six West, Central Minnesota, and Southeastern. Three of the four regions also experienced increases in total population.

Implications for Substate Development

The estimates and projections presented earlier show contrasting trends in the substate distribution of earnings and employment. Over the 20-year period from 1950 to 1970, a pattern emerged of lagging growth in earnings and employment in non-metropolitan areas of the state. In the 1970 to 1975 period, however, this pattern was reversed. Population and income growth in the seven-county Metropolitan Council Region lagged behind the rest of state. This recent reversal in earnings and income trends signaled a shift in the geographic distribution of economic activity to non-metropolitan areas. The two patterns of regional income growth are examined further in this chapter in terms of their implications for the future substate distribution of earnings and employment.

Three Alternative Futures

The two growth options noted earlier can be described, respectively, as focused concentration and dispersed concentration of population, employment and income growth in the state. Focused concentration means the geographic concentration of above-average income payments in the seven-county Metropolitan Council Region. Dispersed concentration, on the other hand, is represented by the recent rapid growth in total income payments in substate develop-

ment regions bordering the Metropolitan Council Region and especially in the counties located within 100 miles of downtown Minneapolis-St. Paul. A third option of selective concentration is identified, also, to describe a policy of guided metropolitan area development in which certain kinds of industry and activity are favored. The three options are illustrated by comparison of the percentage of total income payments which are accounted for by the employed work force and the resident population of the Metropolitan Council Region (Table 5.1). The three options are differentiated by the proportion of (1) total earnings and (2) total personal income received, respectively, by the resident work force and the resident population in the Metropolitan Council Region.

Focused concentration

The period of above-average income growth in the metropolitan area was halted, at least temporarily, by 1975. In the five-year period from 1970 to 1975 personal income payments of the resident population in the Metropolitan Council Region had declined from 58 to 56 percent of the state total. In the first option, personal income payments in the Metropolitan Council Region are projected to reach 65 percent of the state total in 2000. Total earnings are projected to increase from 60 to 67 percent of the state total in the 25-year period from 1975 to 2000.

Income concentration in the Metropolitan Council Region is attributed to growth in population and labor force, industry redistribution of the employed work force, and further growth in property income and transfer payments. The importance of each source of income growth in the state was indicated earlier in the examination of income relationships. In the focused concentration option, the reduction in net earnings due to in-commuting (of non-resident work force) is

Table 5.1. Estimated and projected personal income (in 1967 dollars) received from specified source, Metropolitan Council Region, Minnesota, 1970, 1975 and 2000.

Income source	Estimated ¹				Projected 2000					
	1970		1975		Focused ² concentration		Dispersed concentration		Selective decentralization ³	
	Total payments	Proportion of total state	Total payments	Proportion of total state	Total payments	Proportion of total state	Total payments	Proportion of total state	Total payments	Proportion of total
By place of work:	(mil. \$)	(%)	(mil. \$)	(%)	(mil. \$)	(%)	(mil. \$)	(%)	(mil. \$)	(%)
Total earnings	6,497.4	62	6,906.5	60	21,020.3	67	19,428.3	62	17,836.3	57
Personal contributions	285.8	66	420.3	64	1,458.0	71	1,342.6	66	1,249.7	62
Residence adjustments	211.0	—	-243.3	—	-192.0	—	-1,124.0	—	-180.2	—
By place of residence:										
Net earnings	6,000.6	60	6,242.9	57	19,370.3	66	16,600.3	56	16,406.4	56
Property income	1,032.7	56	1,188.0	55	3,874.5	65	3,278.4	55	3,278.4	55
Transfer payments	572.6	47	908.2	48	2,751.6	55	2,251.3	45	2,251.3	45
Total personal income	7,606.4	58	8,339.2	56	25,996.4	65	22,130.0	55	21,936.1	55

¹Based on unpublished data from the *Regional Economic Information System* (REIS), Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C., 1977.

²Based, in part, on data in: U.S. Water Resources Council, *1972 OBERS Projections, Regional Economic Activity in the United States, Series E Population*, U.S. Government Printing Office, Washington, D.C., April 1974.

³Based on data in Tables 3.2, 3.3, and 4.4.

reduced from \$243.3 million in 1975 to less than \$200 million in 2000. This is equivalent to a reduction in non-resident work force from 34,000 in 1975 to 14,000 in 2000. Both employment and population are concentrated in the Metropolitan Council Region in the focused concentration option.

Dispersed concentration

In the dispersed concentration option, the Metropolitan Council Region lags in personal income growth. This is due to above-average growth of resident population in the expanded metropolitan core area outside the Metropolitan Council Region (which extends approximately 100 miles from downtown Minneapolis-St. Paul).

The dispersed concentration option, which is supported by recent experience, contradicts the assumption of a reduced non-resident work force. In-commuting to the Metropolitan Council Region is projected to increase dramatically (to 48,000 additional non-resident work force). Much of this increase (approximately 90 percent) would originate from the four transitional agricultural-industrial regions.

The dispersed concentration option is essentially an extension of the 1970-1975 trends in the geographic distribution of population to the year 2000. Much of the state's growth in resident labor force would occur in the four transitional agricultural-industrial regions. A corresponding increase in non-resident jobs would occur, also. Thus, the proportion of total personal income in the state would decline from 65 to 55 percent in the Metropolitan Council Region; it would increase from 18 to 28 percent in the four transitional agricultural-industrial regions. In this option, therefore, population is dispersed (within a 100-mile radius of downtown Minneapolis-St. Paul) while jobs are concentrated in the Metropolitan Council Region.

Selective decentralization

The selective decentralization option provides for dispersion of both population and jobs, first, to the four transitional agricultural-industrial and, finally, to other substate regions. In this option, the Metropolitan Council Region share of total earnings (by place of work) and total personal income (by place of residence) would be reduced by 10 percent from the high levels in the focused concentration option. The third option thus represents an extension of 1970 to 1975 trends in the decentralization of both population and jobs, but with job decentralization confined to selected manufacturing, trade, and service industries. High-technology manufacturing, for example, would remain in the Metropolitan Council Region.

The 1972 OBERS income projections used in this study generally conform with the focused concentration option. A concentration of both population and jobs is projected for the Metropolitan Council Region. As shown earlier, post-1970 trends in the geographic distribution of population, employment, and income changes deviate from their projected levels in the OBERS series. The post-1970 trends may represent

only short-run shifts in the three economic indicators, insofar as they are the result of abnormally high agricultural earnings levels and abnormally low manufacturing employment and earnings levels in the mid-1970's.

Composite Scenario of Substate Income Changes With Special Reference to Agriculture

A composite scenario of substate income changes is indicated by a comparison of post-1970 income trends and the income trends depicted in three alternative futures outlined earlier. The composite scenario is a sequence of the three growth options. The focused concentration option persisted until the early 1970's. It is being replaced by the dispersed concentration option. Increasing restrictions on energy use for private transportation and rising metropolitan area land costs and taxes, however, may force another shift from the dispersed concentration to the selective decentralization option.

By the turn of the century, Rochester, St. Cloud, and Mankato will have become intermediate-size cities with an increasingly wider range of production and consumption opportunities for an expanding resident work force. The urbanization of the countryside is likely to continue beyond the intermediate-size cities to area growth centers like Fergus Falls, Willmar, and Marshall, thus further extending the selective decentralization of metropolitan area activities.

Because of the importance of agriculture in non-metropolitan areas of the state, the 1972 OBERS projections are examined further in terms of their implications for the agricultural employment and earnings. Here, too, the post-1970 income trends deviate from the OBERS assumptions. This is indicated by comparison of the 1970 to 1975 trends with projected 1975 to 2000 income levels.

As noted earlier, the abnormally high farm prices of the early 1970's may signal short-run shifts in agricultural prosperity. More data are needed to establish the magnitude and variability of these changes from the projected trends. What the OBERS-based projections already show is a gradual improvement in net farm income per farm proprietor (Table 5.2). In the peak year (1973), farm proprietor earnings were 110 percent greater than non-farm earnings. They declined in 1974 and 1975, but remained above earnings per worker in the non-farm sector of the Minnesota economy. In the OBERS-based series, above-average earnings of farm proprietors are projected to continue in the post-1975 period. This is due largely to the projected decline in the number of farm proprietors.

Substate regions with a dominant agricultural economic base experienced rapid growth in total earnings and total personal income levels in the 1970 to 1975 period. High farm income levels were re-inforced by an expanding non-farm resident work force and, in some areas, an expanding total population. For the dominantly agricultural regions, therefore, agricultural prosperity helped support an expansion of non-agricultural employment opportunities.

The long-run relative importance of agriculture in Minnesota is declining (see Tables 2.1 and 3.1). In 1970, total earnings of the employed work force in agriculture (including farm-related work force) was 7.7 percent of total earnings of the employed work force. In 1973, the total for agriculture increased to 16.5 percent of the state total. It declined to 8.8 percent of state total in 1975. It is projected to decline further to 4.8

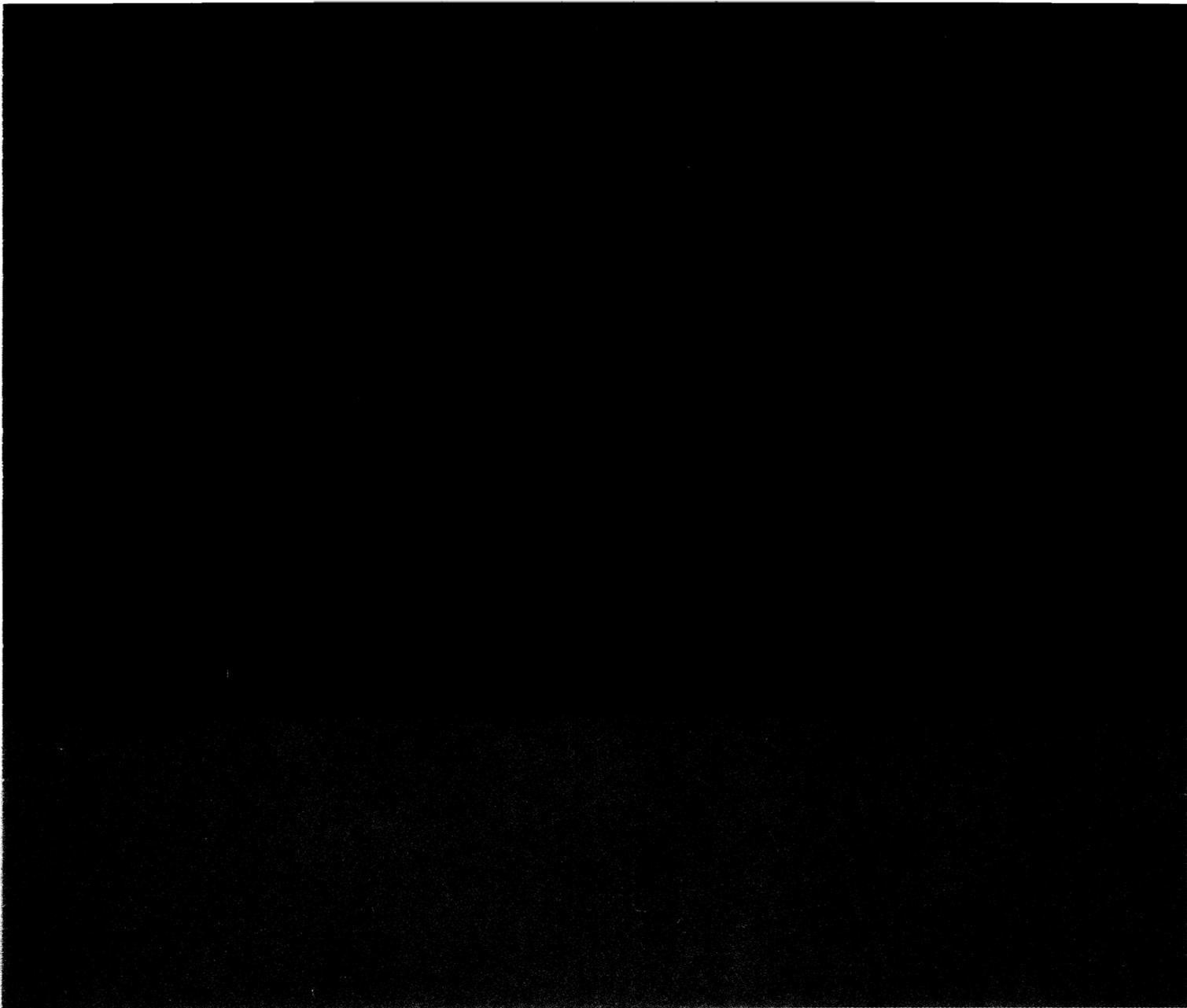
percent of the state total in 1980 and 3 percent of the state total in 2000. The farm-employed work force, as a proportion of the state total, is projected to decline even more rapidly than farm earnings and income. Moreover, this trend is pervasive; it applied to every substate region, even the most dominantly agricultural in each of the alternative futures, including the composite scenario.

Table 5.2. Estimated and projected earnings of farm proprietors and farm-related and non-farm employed work force, Minnesota, 1970-2000.

Year	Total earnings			Earnings per worker		
	Farm Proprietors	Other		Farm proprietors	Other	
		Farm-related	Non-farm		Farm-related	Non-farm
	(mil. \$)	(mil. \$)	(mil. \$)	(\$)	(\$)	(\$)
<u>Estimated (current dollars):¹</u>						
1970	838	72	10,900	6,400	3,300	7,400
1971	721	85	11,491	5,500	3,500	7,800
1972	893	86	12,360	7,000	3,600	8,000
1973	2,290	119	13,723	17,800	4,100	8,500
1974	1,716	148	15,034	13,400	3,400	9,100
1975	1,332	183	16,180	10,400	3,700	9,900
<u>Estimated (1967 dollars):¹</u>						
1970	742	63	9,646	5,700	2,900	6,600
1975	873	121	10,610	6,800	2,500	6,500
<u>Projected (1967dollars):²</u>						
1980	637	106	14,766	8,400	2,700	8,000
1985	655	118	17,527	10,400	3,200	9,000
1990	676	126	20,770	12,000	3,600	10,200
2000	745	144	28,853	15,100	4,600	12,900

¹Based on unpublished data from the *Regional Economic Information System (REIS)*, Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C., 1977.

²Based on data from: U.S. Water Resources Council, *1972 OBERS Projections, Regional Economic Activity in the United States, Series E Population*, U.S. Government Printing Office, Washington, D.C., April, 1974.



[Redacted content]

